

POLICY *dialogue* BRIEF



The Iran Nuclear Agreement: Could It Inform Future Nonproliferation and Disarmament?

Summary

- The Iran nuclear agreement, formally the Joint Comprehensive Plan of Action (JCPOA), contains innovative provisions that, if adapted, could be applied in other countries to facilitate cooperation in nuclear technology and strengthen the cause of nonproliferation and disarmament.
- For states seeking to reinforce or restore international confidence that they are meeting their nonproliferation obligations, enhanced commitments as featured in the JCPOA—on accountancy and safeguards, commensurability, weaponization, and procurement—could be constructive.
- To encourage observance of such enhanced commitments, it will be important to clarify and highlight what practical benefits states stand to gain in return—potentially greater access to fuel services and expanded participation in technical and scientific cooperation programs.
- Expanding observance of these enhanced commitments will face significant political and bureaucratic obstacles. Several agencies, institutions, and negotiation forums could serve as vehicles to advance adaptation and application of such commitments.

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This brief summarizes the primary findings of the conference as interpreted by the rapporteur, Chelsea Green, the organizer, Benjamin Loehrke, and the chair, George Perkovich. Participants neither reviewed nor approved this brief. Therefore, it should not be assumed that every participant subscribes to all of its recommendations, observations, and conclusions.

Additional information about this roundtable and others held as part of the 57th annual Strategy for Peace Conference is available at <http://www.stanleyfoundation.org/spc-2016.cfm>.

Innovative Elements and Adaptations

Accountancy and Safeguards

- Broader acceptance of procedures that move the starting point of materials accountancy so that the International Atomic Energy Agency (IAEA) has greater ability to monitor early stages fuel cycle activities, as done under the JCPOA, would strengthen the IAEA's safeguards capabilities.

Commensurability

- Heightened commitment to commensurability, where a state limits its fuel cycle activities to levels that do not significantly exceed its demonstrated nuclear energy needs, could be useful—particularly for states that seek to develop fuel cycle programs or for states with fuel cycle capabilities that are found noncompliant with their safeguards obligations.

Weaponization

- Fleshing out a general prohibition on the design, development, or acquisition of specific weapons-relevant technologies—as done under the JCPOA—would be a significant innovation for nonproliferation and would clarify boundaries between peaceful and weapons-related programs.

Procurement

- For a state found in noncompliance with its nonproliferation commitments, having that state agree to channel its imports of dual-use items through a procurement mechanism—as created for the JCPOA—would augment or complement existing export controls and help restore confidence that the state is not pursuing nuclear weapons.

The Iran nuclear agreement, known as the Joint Comprehensive Plan of Action (JCPOA), contains innovative provisions that, if adapted, could be applied in other countries to facilitate cooperation in nuclear technology, build confidence that nuclear programs remain exclusively peaceful, and strengthen the cause of nonproliferation and disarmament.

This brief provides key discussion points and conclusions from an expert roundtable convened in October 2016 at the Stanley Foundation's 57th annual Strategy for Peace Conference. Roundtable participants were asked to identify innovative aspects of the JCPOA that could be adapted for other uses, assess their potential utility for advancing nonproliferation and disarmament, and consider the organizational and political challenges to their broader application.

Categories and Added Confidence

The JCPOA is designed to provide confidence that Iran's nuclear program remains peaceful in nature. At a basic level, JCPOA provisions provide examples of commitments that a state could observe to reinforce or restore international confidence that it is meeting its obligations under Articles II and III of the Nuclear Nonproliferation Treaty (NPT). While the text of the JCPOA explicitly states that the agreement is not precedent setting, it is worth considering whether and how some of its innovative provisions could be adapted and used in the future.

The roundtable considered how adaptations of various provisions of the JCPOA could be relevant—and indeed constructive—in three circumstances:

- As routine measures in states complying with their safeguards commitments.
- As measures to allay concerns or build confidence in states where the International Atomic Energy Agency (IAEA) has questions about safeguards compliance.

- As measures to resolve cases where the IAEA or the UN Security Council have determined that nonproliferation commitments have been broken.

Above all, participants emphasized that governments and international bodies should place highest priority on avoiding situations like those that arose with Iran, where an uneconomical and proliferation-alarming fuel cycle program was undertaken in violation of safeguards requirements.

Innovative Elements and Potential Adaptations

Accountancy and Safeguards

The JCPOA moves the starting point of materials accountancy for Iran so that the IAEA has greater ability to monitor early stages of Iran's fuel cycle activities and verify that it is meeting commitments under the agreement. These enhanced measures include IAEA monitoring or safeguards on uranium mining, conversion, and concentration. It also includes monitoring of Iran's centrifuge supply chain and research and development. Additionally, the IAEA employs online live enrichment monitoring systems (OLEMS) to provide continuous measures of Iran's uranium enrichment activities.

The legal basis for these activities is not new. For the most part, they are provided for under states' safeguards agreements and additional protocols. Similarly, for many years, the IAEA has sought to move the beginning of materials accountancy to earlier in the fuel cycle. The routine application of such procedures, as implemented under the JCPOA, is innovative and represents significant advancement toward formalizing earlier accountancy. Broader acceptance of these procedures—specifically those that move the starting point of accountancy to conversion and concentration plants—would strengthen the IAEA's ability to monitor and safeguard member states' nuclear programs.

Roundtable participants suggested that while it would be beneficial for all states to view these enhanced measures as routine, implementing them would not be necessary in all states. Such measures—including monitoring of centrifuge supply chains and continuous enrichment monitoring—would be useful as normal requirements for non-nuclear weapon states that choose to conduct fuel cycle activities. At a minimum they should be deemed necessary to restore confidence in states facing questions regarding, or acting in breach of, their safeguards agreements.

Expanded usage of remote monitoring devices, as seen with OLEMS under the Iran agreement, would also strengthen the IAEA's monitoring and safeguards abilities. Roundtable participants agreed that broader usage of such devices—particularly by any country found in noncompliance or about whom the IAEA has compliance concerns—would make the IAEA more effective at detecting and deterring potential safeguards violations. Furthermore, these technologies could prove useful in cases when inspectors cannot physically access facilities, such as during nuclear accidents. These systems could include OLEMS, online load cell devices, and unattended UF₆ cylinder verification systems. While such systems can enhance the IAEA's ability to accomplish its mission, participants noted that the IAEA's value is its access to sites and the ability to inspect facilities. Remote technologies should supplement, not replace, the agency's inspections abilities.

Commensurability

The JCPOA reflects a principle of commensurability, where the agreement's constraints cap Iran's fuel cycle activities to levels that do not significantly exceed its demonstrated nuclear energy and isotopic needs. This includes provisions that limit Iran's level of uranium enrichment, the size and form of its stockpile of uranium, and the production capacity of its enrichment facilities.

The IAEA already looks for consistency between a member state's nuclear plans and activities in its overall safeguards assessment. However, heightened commitment to commensurability could be useful for two categories of states. First, for states that seek to develop fuel cycle programs, commitments to ensure their commensurability with demonstrable needs for fuel would help build confidence in the peaceful intentions of their nuclear programs. Second, for states that are found noncompliant with their safeguards obligations and that retain fuel cycle capabilities, commensurability would seem to be a necessary element of any effort to restore international confidence. In general, greater willingness to publish information and demonstrate real (as distinct from theoretical) commercial purposes associated with activities in question would facilitate assessments of commensurability.

Participants raised questions about setting criteria for commensurability. Committing to maintain commensurability between a state's peaceful use needs and its fuel cycle capacities would rely on different criteria than the JCPOA, which was specifically designed to limit Iran's breakout time—the speed with which a country could produce sufficient fissile material for a nuclear weapon. The roundtable did not endeavor to design a working definition for commensurability. However, participants supported several criteria that could serve as minimal commitments that states could adopt to demonstrate commensurability, including limiting the level of uranium enrichment to less than 5 percent and limiting the size of uranium and plutonium holdings.

Weaponization

The JCPOA establishes that "Iran will not engage in activities that could contribute to the development of a nuclear device." The JCPOA then lists a number of weapons-relevant technologies that Iran agrees not to design, develop, or acquire. This list includes computer models to simulate nuclear explosive devices,

The weaponization prohibitions within the JCPOA are a significant innovation for nonproliferation.

multipoint explosive detonations systems, explosive diagnostic systems, and explosively driven neutron sources.

The weaponization prohibitions within the JCPOA are a significant innovation for nonproliferation. Non-weapons states already commit, under Article II of the NPT, to not manufacture or acquire nuclear weapons. The NPT, however, does not define what weapons activities short of acquisition states must renounce. Instead, the task of defining dual-use technologies and controlling their spread has largely fallen to voluntary export control arrangements like the Nuclear Suppliers Group (NSG). Fleshing out a general prohibition with specific examples of unpermitted activities, and/or those that could be permitted only after compelling scientific and/or commercial justification for them were provided to the IAEA, would not amount to a new burden. However, it would clarify boundaries between peaceful and weapons-related programs, which would be useful for purposes of nonproliferation and nuclear disarmament.

Such prohibitions would be particularly useful for two categories of states. In circumstances where the IAEA has questions about a state's compliance with its safeguards obligations or finds the state in noncompliance, prohibition of specific weaponization-related activities should be considered imperative, as in the JCPOA.

For the vast majority of states, the provisions that could be adapted from the JCPOA would impose no cost or additional inspections burden.

Roundtable participants agreed that the list of prohibited activities in the JCPOA could be useful, or expanded upon, for future cases. The list is short, categorical, and designed to create technical chokepoints—prohibiting technology development without which states could not build nuclear weapons. Some participants questioned whether the list was comprehensive enough or should be supplemented by other items on the NSG trigger list. Others cautioned that a more exhaustive list would incur greater resistance from countries that perceive such prohibitions as infringing on their access to peaceful technology. An exhaustive list of prohibitions would also be difficult to monitor and verify. In lieu of a new list of prohibitions that dissuade weaponization activities, some participants suggested that the IAEA could instead update and revise the annexes of the Additional Protocol to be more consistent with items from the NSG's trigger list.

Procurement

A procurement channel, established by the JCPOA under the Joint Commission that monitors implementation of the agreement, provides added confidence that sensitive items are not siphoned off into a covert weapons program. This channel has the authority to review and authorize Iran's purchase of dual-use items on the NSG trigger list. Iran is also required to provide the IAEA access to verify the end use and locations of such items sold or transferred to Iran. This new mechanism is operated through a working group comprising representatives from each of the parties to the agreement, with the UN Security Council having ultimate responsibility to approve exports to Iran.

Roundtable participants noted that such an approach could be useful if a state is found in noncompliance with its nonproliferation commitments. Having that state agree to channel its imports of dual-use items through a procurement mechanism would augment or complement existing export controls, strengthen monitoring of dual-use imports, and help restore confidence that the country is not pursuing nuclear weapons.

Given limited data about the management of the JCPOA procurement channel, it is too soon to assess the channel's overall effectiveness and how it could be adapted for other cases. Participants noted the potential difficulties of ensuring that states and entities within states' territories provide notification of export to relevant authorities. Participants also explored how to govern such a procurement arrangement—whether implemented on an ad hoc basis with

parties to an agreement, as done under the JCPOA, or through a neutral institution or the Security Council.

Several participants expressed concern that collusion between two nations could present potential issues for the future. These could be addressed by a verification mechanism, perhaps with more active post-delivery verification by the exporter.

Challenges for Broader Application

Efforts to apply innovative elements of the JCPOA more broadly could face substantial political and bureaucratic obstacles. Non-weapons states are keenly sensitive to restrictions that are perceived as infringing on their access to peaceful nuclear technology. Meanwhile, other states, particularly Russia, remain wary of expanding the IAEA's mandate and of providing opportunities for individual states to try to exploit the IAEA. Furthermore, some of the procedures considered here would carry new costs for the IAEA, member states, and nuclear operators. Avoiding and overcoming such resistance to change will take time and creativity.

The roundtable noted that for the vast majority of states, the provisions that could be adapted from the JCPOA would impose no cost or additional inspections burden. A prohibition of weaponization-related activities would simply reaffirm existing commitments and entail no increase in normal safeguards activity. States with nuclear programs that do not involve indigenous fuel cycle activities would not need to move the starting point of materials accountancy and safeguards and would not be burdened by requirements of commensurability.

States that do seek to undertake indigenous fuel cycle activities would need to expect the monitoring of all related activities, from mining forward, and would be expected to adopt the commensurability principle. However, if implementation of these provisions eased international resistance to their planned programs and helped build international confidence in them, the benefit could outweigh the costs. Conversely, demonstration of added costs and lost opportunities from noncompliance—by creating a package of mechanisms ready to impose on states found in noncompliance—could have a deterrent effect on countries considering efforts to develop weapons capabilities. The participants also agreed that the process by which this package could be implemented—through establishing a regular institutional practice or relying upon ad hoc initiatives—could use further exploration.

Benefit Framing

Participants recognized the need to clarify and highlight what states stand to gain by observing certain prohibitions and enhanced monitoring and safeguards. Absent strong enough incentives, states might oppose such measures. Communicating practical benefits of this approach could encourage participation and circumvent some opposition.

Benefits that demonstrate the monetary value or scientific prestige of participating in such regimes could expand the acceptance of enhanced nonproliferation measures.

Providing access to nuclear fuel services is a strong incentive with broad appeal. Indigenous fuel production is not cost effective for most states, and few states have long-term spent fuel storage abilities. Ideally, in the case of states considering indigenous fuel cycle programs, other states—particularly Russia and the United States—would offer the alternative of leasing and taking back fuel. Giving states incentives to ship spent nuclear fuel to safeguarded international waste repositories, potentially including those under consideration in Finland and Australia, would also help reduce proliferation risks by supporting a norm of reducing countries' stockpiles of recoverable plutonium. Countries could also provide fuel fabrication or fuel rod certification services—a significant benefit for nuclear safety and technical communities—as incentives for countries that have indigenous enrichment programs but observe limits on their programs and allow enhanced monitoring measures. Furthermore, the participants encouraged wider application of converting heavy water reactors to light water reactors, which facilitates peaceful nuclear programs while advancing nonproliferation goals.

Technical and scientific cooperation could be another incentive for states that limit and allow enhanced monitoring of their nuclear programs. Incentives could include expanding and investing in participation of countries' scientists in cooperative research on clean energy technology, medical isotopes, remote verification and monitoring systems, or design of proliferation-resistant technologies. While promoting scientific cooperation is useful for incentivizing safeguards compliance and improving states' security and safety cultures, participants cautioned about the difficulties of such approaches. Getting visas for individuals in sensitive fields can be an obstacle. Such programs could also, conversely, increase a state's ability to advance a weapons program if it sought to do so.

Vectors for Broader Application

The roundtable identified several agencies, institutions, and negotiation forums that could help expand adaptation and application of innovative JCPOA provisions. Each represents a possible vehicle through which countries could commit to observe the enhanced nonproliferation measures discussed above and help strengthen the global nonproliferation regime.

IAEA

Most of the identified innovative elements of the JCPOA—on accountancy, commensurability, and non-weaponization—fall clearly within the IAEA's mandate. Participants noted that several measures could even be implemented by the IAEA Secretariat—with the encouragement of member states—without requiring consent from the Board of Governors.

The JCPOA serves as a test case for whether such enhanced measures are practical and effective.

First, it is important to ensure the successful implementation of the JCPOA. The agreement serves as a test case for whether such enhanced measures are practical and effective. Success or failure by the IAEA will demonstrate whether the agency is able to effectively meet expanded safeguards and monitoring obligations. Roundtable participants suggested exploring measures to make sure the IAEA has the necessary resources to implement its mission under the JCPOA for the duration of the agreement. Participants also strongly recommended that the agency conduct and publish studies of the effectiveness of JCPOA provisions, similar to how the IAEA's "Program 93+2" examined how to make safeguards more effective after 1991 and the discovery of Iraq's covert nuclear weapons program.

Second, roundtable participants noted the significant management challenges that the agency currently faces and expressed concern about the practical feasibility of increasing agency activities. Effectively expanding monitoring and safeguards activities would require greater budgets, increased efficiency, and more staff. It would also require ensuring the agency retains experience and knowledge through more attention to inspector training and education.

Third, participants agreed that normalizing the IAEA's use of remote monitoring systems, like OLEMS, would improve the agency's ability to effectively accomplish its mission. However, challenges remain for establishing a record of experience with these systems and overcoming resistance to the use of remote monitoring. The IAEA might begin conducting remote monitoring and transmission of data from facilities in states that allow it, perhaps by calling on some states to volunteer to have the technology used on their territory.

If use of remote systems reduces the burden on facility operators by decreasing facility downtime associated with IAEA inspections, it might incentivize countries, particularly those in compliance with their commitments, to volunteer accepting remote systems in their facilities. However, further information is needed about how using remote systems might affect the IAEA budget or the costs to facility operators. States might still resist expanding the IAEA's access in facilities because of commercial sensitivities, national security concerns, or for political reasons. However, participants noted that with enough operational experience with these systems, member states could understand their utility and see them as a normal safeguards tool.

Finally, participants offered that the IAEA's Milestones Approach, by which the agency helps member states understand commitments and obligations of developing a nuclear energy program, could be a useful vehicle for generating buy-in for innovative elements from the JCPOA. Revising the "Milestones document" to encourage principles of commensurability and early accountancy would be particularly helpful. The IAEA might also engage in greater dialogue with, and provide more guidance for, enrichment technology holders through a milestone document to reinforce norms on safeguards and security. Overall, participants agreed that a widespread recognition should exist that the emergence of programs whose dual-use activities seem incommensurate with peaceful purposes necessitates international consultation and negotiation.

Nuclear Suppliers Group

The NSG has a central role in preventing the diversion of sensitive technologies. Adapting and applying elements of the JCPOA that monitor and control transfer of dual-use technology could enhance nuclear suppliers' confidence in cooperation with other states. Indeed, states' willingness to embrace relevant provisions, as discussed here, could help NSG members assess and expedite nuclear trade with them.

Roundtable participants suggested that the NSG could modify its guidelines and conditions of supply to advance some of the innovative concepts on commensurability and weaponization. For example, the NSG could make

adherence to the Additional Protocol a condition of supply. Some participants suggested that the NSG could help the IAEA assess safeguards compliance by providing the agency with notifications of denial and approval of supply, either in all cases or only for countries entering into fuel cycle programs. Participants noted with caution that the NSG, which makes decision by consensus, has considered similar proposals over recent years without establishing a new rule. As another obstacle, expanding notification to the IAEA of denial and approval risks commercial sensitivities that member states might strongly resist.

Disarmament Diplomacy

Negotiations on a nuclear weapon prohibition treaty are slated to begin in March 2017. Several elements of the JCPOA, particularly those on prohibitions of weaponization, could be useful in treaty negotiations. They could help define and inform verification of purely peaceful nuclear programs—those that are not seeking to acquire nuclear weapons and those that have disarmed. Roundtable participants noted that the involvement of technical experts in such negotiations, as occurred throughout JCPOA negotiations, could be helpful by facilitating depth and detail when drafting a final document.

Principles and practices within the JCPOA could also help inform measures to enhance the nonproliferation, nuclear cooperation, and disarmament objectives of the NPT, as will be discussed by the preparatory committees for the 2020 NPT Review Conference and the P-5 process. At the Review Conference, a representative group of states—perhaps including Nigeria, South Africa, Ghana, and Thailand—could sign onto working papers that promote adherence to certain JCPOA elements.

Regional Approaches

A regional approach could also help normalize and sustain elements of the JCPOA, starting with encouraging actors in the Middle East to volunteer new obligations. If and when a conference is held regarding a weapons of mass destruction-free zone in the Middle East, the elements of the JCPOA discussed here—including committing to principles of non-weaponization, early accountancy, enhanced safeguards, and/or commensurability—could help define the parameters of allowable nuclear activities and verification procedures for such a zone. A norm could be established in this region based on multilateral efforts, particularly because a majority of the region does not conduct indigenous enrichment activities.

Conclusion

For these proposals to gain traction, they will need leadership from stakeholder countries and institutions. They will also require greater analysis of the effectiveness over time of the innovative provisions of the JCPOA, exploration of political pathways that would allow them to be noncontroversial, and a clearer emphasis on the benefits of adopting such practices.

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