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Crisis as Opportunity

Implications of the Nuclear Conflict with Iran for the Nuclear Non-Proliferation Regime

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Table of Contents

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Crisis as Opportunity: Implications of the Nuclear Conflict with Iran for the Nuclear Non-Proliferation Regime

The conflict over Iran's nuclear programme represents the biggest challenge for international efforts to prevent proliferation of nuclear weapons. For decades, Iran has violated the terms of its safeguards agreement with International Atomic Energy Agency (IAEA), in its drive to develop its own capacity to produce nuclear weapons. The current talks between Tehran and the E3+3 (Germany, France, United Kingdom + China, Russia, United States) end on 24 November 2014. But even if a long-term agreement can be sealed by then, it is likely to be years before international confidence in Iran's peaceful intentions is restored and the country treated as the other non-nuclear-weapon states under the nuclear Non-Proliferation Treaty (NPT).

But what is the impact of the Iranian nuclear conflict on the nuclear non-proliferation regime? In three areas there are major overlaps between the efforts to reach a settlement with Iran and general discussions about strengthening non-proliferation norms, rules and procedures.

The first of these concerns possibilities to reform and strengthen verification of the obligations of non-nuclear-weapon states under the NPT. Secondly, both contexts involve efforts to limit capacities for the production of weapons-grade fissile materials, specifically uranium enrichment and plutonium reprocessing. The third aspect is the question of nuclear fuel supply guarantees, in order to convince governments to refrain from closing their own domestic fuel cycle.

In each of these three spheres, the nuclear dispute with Tehran is likely to have different effects on the norms, rules and procedures set out in the non-proliferation regime. The ninth NPT review conference, which will take place from 27 April to 22 May 2015, offers an opportunity to draw lessons from the nuclear conflict and discuss ideas for future development of the non-proliferation regime.

The conflict has already contributed to clarifying the powers of the IAEA for monitoring civilian nuclear programmes. The Additional Protocol, which originnated in the 1990s in response to Iraq's treaty violations, has been confirmed as an indispensable instrument for investigating undeclared activities. The goal

of making the Additional Protocol the new verification standard should therefore be upheld.

In the course of the crisis the IAEA has also expanded its capacity to investigate possible military research in non-nuclear-weapon states directed towards developing nuclear weapons. The NPT states should acknowledge this development and confirm that military research is a legitimate target of IAEA investigations.

It is presently hard to see how the progress made with Tehran on limiting sensitive nuclear activities can be translated into broader international norms. However, the NPT signatories should welcome Iran's willingness in principle to restrict its nuclear programme for the duration of a comprehensive agreement, for example by not reprocessing plutonium.

After the failure of various E3+3 proposals to guarantee the supply of nuclear fuel for Iran, the broader international discussion about the suitability of such multilateral models as a non-proliferation instrument has also ebbed. The NPT states should therefore emphasise that modest initiatives such as establishing a reserve of low-enriched uranium under IAEA control could certainly contribute to convincing states like Iran to limit their nuclear enrichment capabilities.

Overall, efforts to improve procedures to control and restrict nuclear programmes will enjoy better prospects of success if they are based on a balanced approach. The majority of NPT member states view the treaty as a reciprocal affair where stronger controls must be balanced by progress on nuclear disarmament. Germany is the only non-nuclear-weapon state within the E3+3, the strongest protagonist of nuclear disarmament, and a convinced supporter of effective multilateralism. Thus, Berlin bears a special responsibility for ensuring that initiatives to strengthen control and verification of nuclear programmes put forward in the talks with Iran also reflect the interests of non-nuclear-weapon states in more disarmament and transparency on the part of the nuclear weapons states. The following specific recommendations for German policy can be formulated:

- The German government should press for all states involved in the E3+3 talks to pledge ratification of the Comprehensive Nuclear-Test-Ban Treaty (CTBT).
- Germany should push for the clarification of a possible military dimension of Iran's nuclear programme to be so comprehensive and transparent as to permit the non-nuclear-weapon states in the NPT to assess these activities independently.
- Berlin should ensure that Tehran is not granted any special privileges in connection with resolving the nuclear conflict, for example in relation to the supply of civilian nuclear technology. Preferential treatment could lead to a watering down of multilateral rules and standards.

The Iranian Nuclear Conflict and the Nuclear Non-Proliferation Regime

Any resolution of the conflict over the Iranian nuclear programme will have considerable repercussions for the nuclear non-proliferation regime. Germany, France and the United Kingdom have been attempting since 2003 to find a compromise with Iran over the question of how its nuclear activities can be more effectively inspected and limited in order to minimise the danger of military misuse. In order to restore confidence in its peaceful intentions, Iran will have to temporarily open and restrict its nuclear programme over and above the usual international legal requirements.

Problems with the control of civilian nuclear programmes are neither new nor specific to Iran. Since the dawn of the nuclear age the international community has been discussing how to verify and limit civilian nuclear activities. The founding of the IAEA in 1957 and the agreement on the NPT in 1968 introduced the additional question of how rule-breakers can be encouraged to abide by (or return to) agreed rules, norms and procedures ("compliance") within the nuclear non-proliferation regime.

The conflict over the Iranian nuclear programme, however, has a different quality than previous non-proliferation crises. Iran is not some insignificant nuclear newcomer (as Libya once was), but an influential regional power. Tehran's declared ambition is to join the leading nuclear nations and gain access to all modern nuclear technologies. Unlike North Korea, Iran has not evaded international inspections by withdrawing from the NPT, but has repeatedly and openly challenged the authority of central institutions up to and including the UN Security Council – whose decisions it still refuses to implement. Tehran thus challenges the nuclear order and its central pillar, the NPT, from within.[1] And Iranian criticism of the non-proliferation rules and norms finds an international hearing, especially among the Non-Aligned Movement (NAM), which represents the largest group of NPT member states.

The approach to the Iranian nuclear programme has already influenced the development of the nuclear non-proliferation regime, and will continue to do so, even if it is likely be impossible to translate solutions discussed with Tehran directly into the wider international framework. The history of the conflict and the interests of the main actors are too specific for that to occur.

Iran-specific solutions have been discussed with Tehran in the E3 talks (from 2006 E3+3). The IAEA members (especially the states represented on the Board of Governors)[2] and the NPT states parties have aired better general possibilities to monitor and limit proliferation-sensitive nuclear activities as well as specific approaches for Iran to restore confidence in the peaceful nature of its nuclear programme.

Possibilities for strengthening the non-proliferation regime could arise particularly out of the interaction between the Iran-specific and general discussions. The crisis offers an opportunity to strengthen verification mechanisms and move forward the debate on ways to limit proliferation-sensitive fuel cycle activities.

Whether and how opportunities to strengthen the non-proliferation regime can be grasped will depend largely on the outcome of the Iran talks and the implementation of a possible long-term agreement. But an analysis of the overlap between the nuclear conflict and the non-proliferation regime is worthwhile anyway, because it identifies fields of action where non-proliferation initiatives are especially promising. Even if no agreement can be reached with Iran, it remains important to resolve the general problems that have been revealed in the course of the nuclear dispute.

The Nuclear Non-Proliferation Treaty forms the basis of such efforts, and the norms and rules anchored within it are the point of departure for the discussion about the Iranian nuclear programme. With 190 states parties,[3] the NPT enjoys practically

1 Harald Müller points out that "intrinsic events" that lead participants to embark on "new paths" are especially important for the development of norms. Harald Müller, "Conclusion: Agency Is Central", in *Norm Dynamics in Multilateral Arms Control: Interests, Conflicts, and Justice*, ed. Harald Müller and Carmen Wunderlich, Studies in Security and International Affairs (Athens, GA: University of Georgia Press, 2013), 337–65 (350).

2 Germany has been a member of the IAEA Board of Governors without interruption since 1972.

3 Including North Korea, whose withdrawal announcement of 10 January 2003 is regarded as invalid by certain members.

universal validity. One elementary task of the IAEA is to monitor the treaty compliance of non-nuclear-weapon states like Iran. The central venue for the debate over Tehran's nuclear programme is the UN Security Council, which serves as the final instance for ruling on treaty observance and imposing coercive measures against rule-breakers.

The Iranian nuclear programme will play a central role at the ninth NPT review conference, which takes place from 27 April to 22 May 2015 in New York. In the worst case the Iranian conflict could – as in 2005 – contribute to failure of the conference. In the best case the states parties could utilise progress towards resolving the nuclear conflict to strengthen the regime as a whole.

Such a development would lie in Germany's interest. Berlin has always pushed, principally through the EU framework but also via other channels, to expand the international arrangements for controlling nuclear weapons. Germany insists that the conflict with Iran can only be resolved within the framework and on the basis of existing international rules. Its special role as the only non-nuclear-weapon state participating directly in the E3+3 talks with Tehran also generates special opportunities and a greater responsibility to leverage the nuclear dispute to strengthen non-proliferation norms, rules and procedures.

Intersections of substance between the talks with Tehran and wider efforts to strengthen the non-proliferation regime exist in three main areas. Firstly, both contexts involve verification of civilian nuclear programmes and investigation of possible prohibited activities by non-nuclear-weapon states seeking to develop nuclear weapons. Secondly, both concern limiting the scope of civilian nuclear activities. Thirdly, the question of what incentives non-nuclear-weapon states can be offered to refrain from developing their own enrichment and reprocessing capacities through nuclear fuel supply guarantees is relevant in both cases.

The current list of NPT states parties can be found at http://disarmament.un.org/treaties/t/npt.

Iran and the Verification of Non-Nuclear-Weapon States

The conflict over the Iranian nuclear programme quickly exposed the limits of the IAEA's system of nuclear safeguards. At a press conference in Washington in August 2002, an Iranian opposition group revealed the existence of a partially completed enrichment facility at Natanz and a heavy-water plant at Arak. The IAEA, which until that date had known nothing about these facilities, responded by stepping up its monitoring of the Iranian nuclear programme. Growing evidence also came to light that Tehran had been conducting military research to develop nuclear weapons and delivery systems.

The System of Nuclear Safeguards

Two questions are central to the discussion about verification of Iran's ostensibly civilian nuclear facilities: What possibilities does the current safeguards regime offer? And how can existing procedures and instruments for verifying the peaceful character of the nuclear programme be improved? Both these matters are also of wider relevance.

At the beginning of the nuclear conflict, Tehran argued that the IAEA had no right to demand information about activities that had no direct connection with fissile materials. It asserted that the research and development of centrifuges for uranium enrichment was only declarable if uranium was involved. Tehran protested that the IAEA was overstepping its powers by searching for non-declarable equipment and materials.[4]

But Iran's position was not accepted, and it failed to gather any meaningful support for its narrow interpretation among the international community. The IAEA argued successfully that a comprehensive safeguards agreement did indeed offer a legal basis for verifying the *completeness* of the declaration of a non-nuclear-weapon state.[5]

May a state unilaterally suspend its safeguards agreement? Are such agreements only binding after they have been ratified? This was a second point of contention concerning the interpretation of existing legal obligations.

Here too, the IAEA's perspective won through: both safeguards agreements and subsidiary arrangements are legally binding, even where they have yet to be ratified by the respective national parliament.[6]

If the Iranian standpoint had been accepted, that would have inevitably had far-reaching consequences for the binding character of subsidiary arrangements, and thus ultimately for all safeguards agreements.[7] Other countries would also have been able to suspend implementation of their safeguards agreements with reference to the Iranian example.[8] The international

4 IAEA, "Communication of 5 March 2004 from the Permanent Mission of the Islamic Republic of Iran concerning the Report of the Director General contained in GOV/2004/11", INFCIRC/628, Vienna, 2004, http://www.iaea.org/Publications/Documents/Infcircs/2004/infcirc628.pdf (accessed 18 July 2014), paragraph 11.d. For an explanation of this argument see Daniel Joyner, "The IAEA Applies Incorrect Standards, Exceeding its Legal Mandate and Acting Ultra Vires Regarding Iran", *Arms Control Law*, 13 September 2012, http://armscontrollaw.com/2012/09/13/the-iaea-applies-incorrect-standards-exceeding-its-legal-mandate-and-acting-ultra-vires-regarding-iran (accessed 24 September 2014).

5 This position is backed by the NPT. See "Final Document of the 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons", NPT/CONF.2010/50, vol. 1, New York, 2010, paragraph 13, http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/npt/revcon2010/FinalDocument.pdf (accessed 24 September 2014).

6 United Nations, Security Council, "Resolution 1929 (2010)", S/RES/1929 (2010), paragraph 5, http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N10/396/79/PDF/N1039679.pdf?OpenElement (accessed 7 July 2014).

7 Christopher A. Ford, *Iran, Nonproliferation and the IAEA: A Legal History* (Washington, D.C.: Hudson Institute, November 2012), 6, http://www.hudson.org/content/researchattachments/attachment/1077/ford–iraniaeapaper1112.pdf (accessed 2 July 2014).

8 This is not an abstract danger. For example, the legally binding nature of safeguards agreements was at issue in 2009 when one was under negotiation for India's nuclear reactors. India insisted on the right to suspend safeguards measures if its supply of nuclear fuel was interrupted. The IAEA rejected this demand and insisted that safeguards agreements are permanent and cannot be suspended unilaterally. Oliver Meier, "India, the Nuclear Suppliers Group and the Legitimacy of the Nuclear Non-proliferation Regime", in *Technology Transfers and Non-proliferation of Weapons of Mass Destruction: Between Control and Cooperation*, ed. Oliver Meier (London, 2014), 116–33 (126).

community's firm response to Tehran's violations avoided such a watering down of international rules.

New Verification Instruments

The course of the nuclear conflict has confirmed the importance of the Additional Protocol as an integral component of the IAEA verification system. States that sign a Protocol agree to supply the IAEA with additional information about their nuclear programmes. They must grant inspectors access to undeclared facilities and locations on declared nuclear sites. The Additional Protocol also expands the IAEA's right to apply enhanced verification techniques such as air and soil sampling. The IAEA uses this and other data (for example from public sources) to generate country profiles that allow thorough evaluation of the plausibility of states' declarations.

All of Iran's negotiating partners, the IAEA Board of Governors and the UN Security Council have called upon Tehran to ratify and implement the Additional Protocol, with no effect to date. The IAEA insists that only on the basis of an Additional Protocol is it possible to verify that there are no secret nuclear activities or materials in Iran.

In the Joint Plan of Action (JPOA) agreed with the E3+3 in Geneva on 24 November 2013, Tehran accepted "enhanced monitoring" of its nuclear programmes.[9] The JPOA also contains elements from Iran's Additional Protocol, for example concerning declaration of plant and equipment. In addition to sixteen facilities and nine other locations that are already under inspection, the IAEA received access to five further sites when implementation of the JPOA began on 20 January 2014.[10] In the Plan of Action Tehran also accepted that the Additional Protocol would have to be part of any overall package to resolve the nuclear dispute.

In the course of the conflict it has become clear that the Additional Protocol may not be enough to create confidence in Iran's peaceful intentions. For a long time Tehran insisted on a literal interpretation of the verification obligations laid out in the CSA. Only after Hassan Rohani's election in June 2013 did he, as the new president, clear the way for a shift in position. During his election campaign Rohani was already arguing for Iran to accept additional transparency measures in order to engender international confidence in the peaceful intentions of its nuclear programme. Under Rohani, Tehran dropped its insistence that the IAEA verify the civilian character of the nuclear programme using only the existing instruments, and gave a little ground on demands for greater openness. The decisive question was no longer whether Iran would accept additional inspections as part of a long-term solution of the nuclear conflict, but only on what scale and during what timeframe such measures could be conducted.

From the verification perspective, this connection between the intensity of verification measures and the degree of trust in a state's peaceful intentions is significant, because it is the core of a reform of the IAEA safeguards system. Under its state-specific verification approach the IAEA has been seeking since the turn of the century to target its verification activities more efficiently, scaling back costly and labour-intensive routine activities in states where there are no indicators of non-compliance and where the technical basis for military misuse of civilian nuclear facilities does not exist.[11]

In the absence of any sign of undeclared activities and given confirmation that the respective state's reports are correct, the IAEA can draw so-called "broader conclusions" for any country that implements a comprehensive safeguards agreement and an Additional Protocol, and scale back its routine verification measures there. By the end of 2011 the IAEA had drawn "broader conclusions" for sixty-three countries and was considering doing so for another fifty-one.[12]

9 IAEA, "Communication dated 27 November 2013 received from the EU High Representative concerning the text of the Joint Plan of Action", INFCIRC/855, Vienna, 27 November 2013, http://www.iaea.org/Publications/Documents/Infcircs/2013/infcirc855.pdf (accessed 5 August 2014).

10 These concern two uranium mines and three facilities for developing and manufacturing gas ultracentrifuges. Some of the IAEA's inspection rights under the JPOA extend beyond the Additional Protocol. For example, inspectors can demand daily access to the enrichment facilities at Fordow and Natanz to read offline monitoring equipment there.

11 "Towards More Effective Safeguards: Learning Hard Lessons. Opening Plenary Address by IAEA Deputy Director General Herman Nackaerts", INMM Annual Meeting, 18 July 2011, http://www.inmm.org/AM/Template.cfm?Section=Evolving_the_IAEA_State_Level_Concept&Template=/CM/ContentDisplay.cfm&ContentID=2971 (accessed 22 July 2014).

12 U.S. Government Accountability Office (GAO), "Nuclear Nonproliferation: IAEA Has Made Progress in Implementing Critical Programs but Continues to Face Challenges", GAO-13-

The connection between the IAEA's state-specific verification approach and a possible resolution of the nuclear conflict could be further strengthened by making "broader conclusions" a precondition for relaxing sanctions.[13] From the non-proliferation perspective this would have the advantage that decisions about progress in the nuclear conflict would be made on the basis of IAEA findings. Such a move would involve a risk of politicising the Vienna-based Agency, but would also underline the importance of its state-specific approach and its role in resolving non-proliferation crises above and beyond the concrete case of Iran.

Verification of Possible Military Research and Development Activities

Since 2003 the IAEA has been attempting to verify possible Iranian nuclear weapon development programmes. These activities have played a role in honing its tools, but also spotlighted legal and technical gaps in the verification system.

From the non-proliferation perspective it is important to clarify any possible military dimension of the Iranian nuclear programme, for four reasons. Firstly, to reduce the danger of Iran secretly continuing to work on developing nuclear weapons. Secondly, because a military programme creates a risk of proliferation, even if Iran were to cease all activities connected with developing nuclear weapons. Thirdly, because active cooperation in the investigation of possible military research would indicate that Iran's claims of pursuing a peaceful nuclear programme are credible. Otherwise the continuing doubts about Tehran's compliance threaten to undermine the non-proliferation regime. Fourthly, an investigation of illicit activities directed towards producing weapons of mass destruction could form the basis for creating more effective verification instruments and procedures.

These arguments for the investigation of a military dimension of nuclear programmes must be balanced against the difficulties and disadvantages associated with such a process. Two points should be considered here. Firstly, the IAEA operates on an ambiguous legal basis when investigating a possible military dimension. There is no generally accepted definition of the scope of the term "manufacture" of nuclear explosive devices as used in Article 2 of the NPT. Article 3.1 in turn obliges every non-nuclear-weapon to negotiate and accept safeguards with the IAEA

"for the exclusive purpose of verification of the fulfilment of its obligations assumed under this Treaty with a view to preventing diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices."[14]

In other words, there is no explicit mention of verification of activities connected with the development of nuclear weapons. The IAEA may investigate military research and development activities in connection with declarable fissile materials, in which case the comprehensive safeguards agreements apply. But what if the IAEA wants to verify activities that could serve the development of nuclear weapons but involve no fissile materials? Many non-nuclear technologies must also be mastered before nuclear weapons can be produced, first and foremost: high-performance conventional detonators, missile warheads and sophisticated computer simulations.

The legal possibilities for verifying such activities where there is no "nexus" with nuclear material remain contested.[15] Some experts suggest that the IAEA cannot act in such a case, while others interpret the provisions of Article 3.1 such that the purpose of IAEA safeguards is to *prevent* nuclear energy being used for nuclear weapons.[16]

Secondly, there is a danger of non-nuclear-weapon states receiving access to sensitive information in the course of the verification process. The handling of such data is therefore compartmentalised within the IAEA, with the five NPT nuclear weapons states receiving privileged access to sensitive information. There is concern that the E3+3 and/or the IAEA could take

139, (Washington, D.C., May 2013), 13f., http://www.gao.gov/assets/660/654714.pdf (accessed 25 September 2014).

13 International Crisis Group, *Iran and the P5+1: Solving the Nuclear Rubik's Cube*, Middle East Report 152 (Istanbul, Tehran, Geneva, Vienna and Brussels, 9 May 2014), vii, http://www.crisisgroup.org/~/media/Files/Middle%20East%20North%20Africa/Iran%20Gulf/Iran/152-iran-and-the-p5-plus-1-solving-the-nuclear-rubiks-cube.pdf (accessed 25 September 2014).

14 "The Treaty on the Non-Proliferation of Nuclear Weapons", Article 2, http://www.un.org/en/conf/npt/2005/npttreaty.html (accessed 5 November 2014).

15 IAEA Board of Governors, "Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran", GOV/2006/14, Vienna, 4 February 2006, paragraph 49, http://www.iaea.org/Publications/Documents/Board/2006/gov2006-14.pdf (accessed 27 July 2014).

16 John Carlson and Andreas Persbo, "The IAEA Safeguards Function", VERTIC blog, 8 October 2013, http://www.vertic.org/pages/posts/the-iaea-safeguards-resolution-return-to-consensus-547.php.

decisions on how to handle relevant information about Iranian nuclear weapons research activities over the heads of the other IAEA and NPT members. Such fears are not entirely unfounded. The IAEA Secretariat has apparently occasionally passed exclusive information to the E3+3 about progress in its talks with Tehran about a possible military dimension. Although the Geneva Plan of Action and the Implementation Agreement provide for the E3+3 and IAEA to establish a Joint Commission at expert level to facilitate the process of investigating military activities, it has to date played no role in the talks with Tehran.[17] The IAEA Secretariat has yet to inform the IAEA General Conference or meetings of NPT states parties in detail about progress in investigating Iranian nuclear weapons development activities. But withholding relevant knowledge from the states parties will create problems of inclusivity and erode the legitimacy of verification measures.

Given these procedural difficulties, it is quite astonishing how much progress has been made with verifying militarily relevant activities conducted by Iran. The case of Iran demonstrates first of all that research towards producing nuclear weapons may leave behind so much evidence that the IAEA will stumble upon it eventually, even without any systematic search.[18] In recent years the Agency has also purposefully expanded its access to relevant information connected with the development of nuclear weapons. These days it draws on a spectrum of information including open sources and intelligence data supplied by third parties to supplement data originating from member-states' declarations or gathered during inspections.

The fifteen-page annex to the IAEA Safeguards Report of 8 November 2011 collated all the indications of a possible military dimension of the Iranian nuclear programme. According to the Agency, the compilation is based to some extent on information supplied by more than ten states parties, for example covering Iranian procurement activities, commercial and financial transactions, and travel movements. The basis for the IAEA to use such data is Article 8.A of its statute, which calls upon all members to "make available such information as would, in the judgement of the member, be helpful to the Agency". The Agency also drew upon its own sources, including commercial satellite imagery and interviews conducted inside and outside Iran. The IAEA stresses that precisely this diversity of sources enabled it to correlate the sources and thus evaluate the information's credibility. As a result the Annex is the most comprehensive IAEA document to date describing possible efforts of a non-nuclear-weapon state to develop nuclear weapons.[19]

Tehran initially rejected the PMD report of November 2011 as "unprofessional and absolutely unfair, illegal and politicized",[20] but has in the end come to accept it as the basis for clarifying a possible military dimension. On 11 November 2013 the IAEA and Iran agreed a "Framework for Cooperation" to successively clarify twelve open questions on the basis of the PMD report.[21]

It is also open whether the IAEA will be able to confirm full Iranian cooperation in clarifying possible nuclear weapons development activities by the time of the putative conclusion of a long-term agreement with the E3+3. Should that not be the case, the E3+3 may find itself facing the difficult decision as to whether to make such clarification a precondition for signing a long-term agreement to resolve the nuclear dispute.

The largest remaining obstacle is that Iran still refuses to admit that activities to develop nuclear weapons have taken place at all. One face-saving solution could be to publish the basis and conclusions of a PMD investigation but to keep its precise details confidential.[22] Such a procedure would also reduce the danger of leakage of sensitive knowledge to third parties.

17 Mark Hibbs, "Deconstructing Sherman on PMD", *ArmsControlWonk*, 19 February 2014, http://hibbs.armscontrolwonk.com/archive/2527/deconstructing-sherman-on-pmd (accessed 25 September 2014).
18 James Acton and Carter Newman, *IAEA Verification of Military Research and Development*, Verification Matters 2006/5 (London: VERTIC, 2006), 20 f., http://www.vertic.org/media/assets/Publications/VM5.pdf (accessed 25 September 2014).
19 IAEA Board of Governors, "Implementation of the NPT Safeguards Agreement and relevant provisions" (see note 15).
20 IAEA Board of Governors, "Communication dated 8 December 2011 received from the Permanent Mission of the Islamic Republic of Iran to the Agency regarding the Report of the Director General on the Implementation of Safeguards in Iran", INFCIRC/833, Vienna, 2011, paragraph 4, http://www.iaea.org/Publications/Documents/Infcircs/2011/infcirc833.pdf (accessed 22 July 2014).
21 IAEA, "Joint Statement on Framework for Cooperation. International Atomic Energy Agency", Press Release 2013/21 (Vienna, 11 November 2013), http://www.iaea.org/newscenter/pressreleases/2013/prn201321.html (accessed 12 February 2014).
22 See for example Jeffrey Lewis, "We Don't Want to See Iran's Full Monty", *Foreign Policy*, 15 September 2014, http://www.foreignpolicy.com/articles/2014/09/15/we_don_t_want_to_see_iran_s_full_monty_nuclear_weapons_deal (accessed 25 September 2014).

Limiting Proliferation-Sensitive Activities

The biggest challenge on the road to a diplomatic solution is currently the question of a compromise on limiting Iran's uranium enrichment capacity. The objective here is to extend the amount of time Iran would require to produce a nuclear weapon, should it to decide to break all its treaty promises and launch a sprint for the atom bomb. This timespan is referred to as "breakout capacity".

Breakout capacity is generally equated with the time required to produce sufficient weapons-grade uranium or plutonium to build a nuclear warhead.[23] But in fact a series of other steps would be required before Tehran acquired the ability to use nuclear weapons. For example, highly enriched uranium must be converted from gaseous to solid state and processed into uranium metal. The metal then must be machined into a warhead pit and assembled with other warhead components including conventional explosives and detonator electronics. The completed warhead must then be mounted on a suitable delivery vehicle, such as a missile. Washington believes that Tehran would require up to a year for all these steps.[24] Finally, it must be assumed that Iran – like almost all other nuclear powers – would also wish to test any newly developed warhead.[25]

One reason why the search for a compromise on limiting Iran's enrichment capabilities is so difficult is because there are no binding international rules placing limits on the scope of civilian nuclear programmes. Article 4 states that nothing in the NPT

"shall be interpreted as affecting the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination and in conformity with Articles I and II of this Treaty".[26]

For non-nuclear-weapon states, unrestricted access to nuclear energy thus comes with the proviso that they keep their promises to refrain from developing nuclear weapons and to conclude comprehensive safeguards agreements with the IAEA. All attempts to come up with universal rules about the conditions under which members may enrich uranium or undertake other fuel cycle activities have to date failed.

Below the threshold of a UN Security Council resolution there is thus no possibility to force a state to restrict its nuclear activities.[27] In the case of Iran such a step initially appeared unnecessary because the country agreed to accept limits on its nuclear programme in the agreements of Tehran (October 2003) and Paris (November 2004). The Iranian leadership terminated this voluntary moratorium by resuming uranium conversion in August 2005. Then, after the IAEA Board of Governors resolution of 2 February 2006 referring the case to the Security Council, Iran began enriching uranium.[28]

The Board of Governors had also ruled that Tehran must cease all enrichment- and reprocessing-related activities for the sake of confidence-building. Finally, in Resolution 1696 of 31 July 2006, the Security Council replaced voluntary confidence-building measures with mandatory restrictions on the Iranian nuclear

23 The IAEA defines the relevant quantity as eight kilogrammes of plutonium or highly enriched uranium. In fact, modern warheads can be manufactured using smaller amounts of weapons-grade fissile material. Trevor Findlay, *Unleashing the Nuclear Watchdog: Strengthening and Reform of the IAEA* (Ontario: Centre for International Governance Innovation, 2012), 70.

24 Greg Thielmann and Robert Wright, "How a Widely Misunderstood Term Could Doom the Iran Nuclear Negotiations", *Slate*, 18 June 2014, http://www.slate.com/articles/news_and_politics/foreigners/2014/06/iran_u_s_nuclear_negotiations_in_vienna_why_it_s_critical_to_understand.html (accessed 25 September 2014).

25 As far as is known, apart from Israel and South Africa all states with nuclear weapons have declared their nuclear capability and demonstrated it by testing.

26 "The Treaty on the Non-Proliferation of Nuclear Weapons", Article 4, http://www.un.org/en/conf/npt/2005/npttreaty.html (accessed 5 November 2014).

27 Security Council resolutions have been used twice. Following the Gulf War of 1990/91 the Security Council's ceasefire resolution demanded that Iraq declare and decommission all weapons-capable nuclear materials and all facilities capable of producing them. In 2006, in response to North Korea's first nuclear test the Security Council demanded that Pyongyang "shall abandon all nuclear weapons and existing nuclear programmes in a complete, verifiable and irreversible manner". United Nations Security Council, "Resolution 1718 (2006)", *S/RES/1718*, New York, paragraph 6.

28 IAEA Board of Governors, "Implementation of the NPT Safeguards Agreement and relevant provisions" (see note 15).

programme. Acting under Chapter VII of the UN Charter it demanded: "Iran shall suspend all enrichment-related and reprocessing activities, including research and development, to be verified by the IAEA."[29]

Iran insists tenaciously that its *right* to close the nuclear fuel cycle must not be infringed. But it is willing to accept limited, temporary quantitative and qualitative restrictions on its nuclear programme and fissile materials.

Firstly, Iran has accepted limits on the qualitative development of its nuclear programme, and implemented these until 2006 and from November 2013. Under the Paris agreement, for example, Tehran agreed not to conduct any testing of uranium centrifuges or conversion equipment.[30] And under the JPOA of 2013 Iran is permitted to continue research to improve centrifuge performance, but may not use more efficient centrifuges for enrichment.

Efforts to institute long-term qualitative restrictions on enrichment, however, have scant chance of success. There are no precedents for restricting the development of "dual use" technologies in this way. And because the efficiency of gas ultracentrifuges is decisive for the economic competitiveness of commercial enrichment facilities, states are unwilling to accept such limits.[31]

Secondly, there is a question as to whether and how the operation of facilities suitable for producing weapons-grade fissile materials can be limited. As far as is known, Iran possesses no reprocessing facility,[32] and in the JPOA it renounced the capability to reprocess plutonium for the duration of the agreement. It has also agreed to refrain from the technology in the scope of a possible long-term agreement.[33] The future of the heavy water reactor at Arak is unclarified, but it appears that a technical modification could reduce the amount of plutonium it produces.[34]

The nuclear talks are therefore focussed on limiting uranium enrichment capacity. That objective can be achieved by limiting the number of centrifuges, their performance, the quantity of input and/or the quantity of enrichment product, or modifying the plant configuration. In the course of the talks with Iran these approaches have been pursued individually and in various combinations.

One relevant variable is Iran's current need for low-enriched uranium to operate its light water reactor at Bushehr and the Tehran research reactor (TRR). Future demand will depend on whether the country builds more reactors, whether it converts the Arak heavy water reactor to operate on low-enriched uranium and whether it intends to export nuclear fuel. The Iranian leadership has also raised the possibility of producing highly enriched uranium to power ships and submarines.[35]

The E3+3 emphasise that Iran will have little legitimate need for low-enriched uranium for the foreseeable future. The light water reactor built by Russia at Bushehr will continue to be supplied with Russian fuel until at least 2021. And Iran already possesses sufficient uranium enriched to 19.75 percent to operate the Tehran Research Reactor for ten to twenty years.[36]

29 United Nations Security Council, "Resolution 1696 (2006)", S/RES/1696, New York, 31 July 2010, http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N06/450/22/PDF/N0645022.pdf?OpenElement (accessed 5 November 2014).

30 IAEA, "Communication dated 26 November 2004 received from the Permanent Representatives of France, Germany, the Islamic Republic of Iran and the United Kingdom concerning the agreement signed in Paris on 15 November 2004", INFCIRC/637, Vienna, 26 November 2004, http://www.iaea.org/Publications/Documents/Infcircs/2004/infcirc637.pdf (accessed 25 September 2014).

31 Enrichment facilities producing nuclear fuel for the international market exist in France, Germany, the Netherlands, Russia, the United Kingdom, and the United States.

32 Although Iran did conduct reprocessing experiments between 1988 and 1993, in which about 100 milligrammes of plutonium were extracted from fuel rods irradiated in the Tehran Research Reactor (TRR). Nuclear Threat Initiative, "Tehran Nuclear Research Center (TNRC)", website article, 21 August 2013, http://www.nti.org/facilities/265 (accessed 25 September 2014).

33 IAEA, "Joint Plan of Action: Communication dated 28 November 2013 received from the Permanent Mission of the Islamic Republic of Iran to the Agency concerning the text of the Joint Plan of Action", INFCIRC/856, Vienna, 29 November 2013, http://www.iaea.org/Publications/Documents/Infcircs/2013/infcirc856.pdf (accessed 25 September 2014).

34 Ali Ahmad, Frank von Hippel and Zia Mian, "A Win-Win Solution for Iran's Arak Reactor", *Arms Control Today* 4 (2014): 8–13.

35 "Iran to Enrich Uranium to 50% if Nuclear-powered Vessels Needed – Official", *Trends News Agency*, 13 April 2013, http://http://en.trend.az/regions/iran/2139956.html (accessed 4 July 2014).

36 Institute for Science and International Security, "Tehran Research Reactor Fuel Requirements", website article, http://www.isisnuclearіran.org/static/444 (accessed 25 September 2014); IAEA Board of Governors, "Status of Iran's Nuclear Programme in relation to the Joint Plan of Action: Report by the Director General", GOV/INF/2014/16, Vienna, 20 July 2014, http://www.isis-online.org/uploads/isis-reports/documents/JPOA_IAEA_update_20Jul2014_1.pdf (accessed 25 September 2014).

Iran's negotiating partners therefore wish to restrict the number of centrifuges at the enrichment facilities at Natanz and Fordow, while at least Washington also insists on dismantling a substantial part of the existing capacity. Iran, on the other hand, argues that it intends to meet its own future fuel demand and must therefore expand its existing capacity.

The attempt to link enrichment capacity to economic need has little prospect of success because such demand is not objectively identifiable. A country like Brazil can justify expanding its enrichment facilities with the objective of exporting nuclear fuel.[37] Or one can, like Iran, point to plans to expand domestic nuclear power programmes in order to legitimise the expansion of enrichment capability. Both arguments lead to highly subjective assessments of nuclear fuel needs.

Thirdly, the nuclear talks are about limiting the quantity and quality of fissile materials kept within Iran. The time required to produce a significant quantity of weapons grade fissile material depends on the quantity and quality of enriched U235 stocks.

The focus on limiting enrichment capacities can partly explained by domestic factors. Several members of the US Congress have declared a substantial reduction in Iranian enrichment capacity to be the most important yardstick of American success in the talks. Iranian leaders in turn have declared any reduction in existing capacity to be a "red line". There is a danger that this fight will obscure the question of effective monitoring, which is more important from the non-proliferation perspective.

37 Oliver Thränert and Sascha Albrecht, *Die Multilateralisierung des nuklearen Brennstoffkreislaufs: Wie kann die aufstrebende Regionalmacht Brasilien konstruktiv eingebunden werden?* SWP-Aktuell 31/2010 (Berlin: Stiftung Wissenschaft und Politik, April 2010).

Supply Guarantees as a Non-Proliferation Instrument

Over the course of the nuclear conflict many attempts have been made to persuade Tehran to cease particular fuel cycle activities in return for nuclear fuel supply guarantees. This occurred in the context of a general debate about multilateral initiatives to control the fuel cycle.[38]

Between 2006 and 2009 for example – against the backdrop of the nuclear dispute – various different states introduced about a dozen different proposals for multilateralisation.[39] But only the idea of guaranteeing the supply of nuclear fuel still plays a role today as an element of a possible political solution to the nuclear conflict with Iran. The goal is to reduce Iran's need for domestic enrichment capacities.

Iran justifies its plans to expand enrichment with the wish for greater energy autarky. Tehran has reportedly already asked to Russia to amend the existing supply contract to permit Iran to produce its own fuel for the reactor already operating at Bushehr. It is unclear whether Iran would be technically capable of producing fuel elements for Iranian reactors of Russian design, as it lacks the technical infrastructure to produce nuclear fuel on such a large scale. Moreover, the technical specifications of fuel elements are normally patented trade secrets that manufacturers guard precisely to protect their long-term supply contracts. Russia has also stated that its liability for safe operation of Bushehr would end should Iran use fuel elements produced indigenously.[40]

Tehran and Moscow are planning to build more reactors in Iran, which Iran intends to supply with its own nuclear fuel.[41] Supreme Leader Ali Khamenei said in July 2014 that Iran would need about 190,000 separative work units (SWU) to supply its future nuclear power stations with fuel.[42] At that point the operational Iranian enrichment facilities had a capacity of no more than around 10,000 SWU.

However, Iran cannot assert any urgent need for its own nuclear fuel, because Russia has to date fulfilled all its supply obligations to Iran and to all other countries with which it maintains nuclear energy cooperation agreements.[43] It is regarded as unlikely that Russia would depart from that policy, because to do so would cause lasting harm to its reputation as a reliable partner in the international nuclear business.

Two concrete projects aiming to strengthen international supply guarantees are currently being implemented. In November 2009 the IAEA approved a plan to establish an international nuclear fuel reserve at Angarsk in Russia,[44] while an international con-

38 A useful summary is provided by Mark Fitzpatrick, "Containing the Iranian Nuclear Crisis: The Useful Precedent of a Fuel Swap", *Perceptions* 16, no. 2 (2011): 27–42.

39 Some of these proposals were based on the report of a commission of experts established by Mohamed ElBaradei. IAEA, *Multilateral Approaches to the Nuclear Fuel Cycle: Expert Group Report to the Director General of the IAEA* (Vienna, 2005), http://www-pub.iaea.org/MTCD/publications/PDF/mna-2005_web.pdf (accessed 25 September 2014). An overview of the proposals is found in IAEA, "Revisiting the Nuclear Fuel Cycle: Multilateral Approaches to the Fuel Cycle", http://iaea.org/newscenter/focus/fuelcycle/index.shtml (accessed 29 July 2014).

40 George Perkovich, "Ensuring Nuclear Fuel for Iran Could Put the Country in a Box", *Washington Post*, 10 July 2014, http://www.washingtonpost.com/opinions/a-nuclear-deal-with-iran-should-focus-on-stockpiling-fuel-for-research-not-a-bomb/2014/07/10/1389ae36-06e2-11e4-bbf1-cc51275e7f8f_story.html (accessed 25 September 2014).

41 "Russia May Build Eight Nuclear Reactors for Iran", *Reuters*, 22 May 2014, http://www.todayszaman.com/business_russia-may-build-eight-nuclear-reactors-for-iran_348496.html (accessed 25 September 2014).

42 Michelle Moghtader and Fredrik Dahl, "Iran's Supreme Leader Calls for More Enrichment Capacity", *Reuters*, 8 July 2014, http://mobile.reuters.com/article/idUSKBN0FD0MY20140708?irpc=932 (accessed 25 September 2014). A "separative work unit" (SWU) denotes the energy required to separate uranium isotopes, and thus the efficiency of gas centrifuges.

43 Even after the 2014 Crimea crisis Moscow avoided calling into question its deliveries of nuclear fuel to Ukraine. Kiev would naturally like to diversify the fuel supply for its fifteen reactors, most of which are type VVER-1000 like Bushehr. So far, however, attempts to produce fuel elements for the Russian-built reactors jointly with the US company Westinghouse have failed for technical reasons. "More Westinghouse Fuel for Ukraine", *World Nuclear News*, 11 April 2014, http://www.world-nuclear-news.org/enf-more-westinghouse-fuel-for-ukraine-1104144.html (accessed 16 July 2014).

44 Cole J. Harvey, "The Low-Enriched Uranium Fuel Reserve at Angarsk", *Nuclear Threat Initiative*, 19 January 2010, http://www.nti.org/analysis/articles/uranium-fuel-reserve-angarsk (accessed 25 September 2014); Jonas Schneider and Oliver Thränert, "*Dual Use*": *Der schwierige Umgang mit Urananreicherung*,

sortium intends to establish a fuel bank of low-enriched uranium in Kazakhstan. The idea: If the supply of nuclear fuel to a NPT member is interrupted for political reasons, the shortfall can be made up from this stock. Sufficient funding to realise the project became available in 2011, when a private foundation and several IAEA members provided $150 million. But bureaucratic obstacles still stand in the way of realisation, and in June 2014 the IAEA and Kazakhstan were still at odds over the legal modalities of this "fuel bank".[45] Even the prospect of the fuel bank serving to underpin a nuclear deal with Iran has not accelerated the process.[46]

It is debatable whether Iran would even be eligible to receive nuclear fuel from an internationally operated fuel bank. In order to prevent violators from exploiting such a mechanism for nefarious purposes, all proposals for multilateralisation of fuel cycle activities rest on the principle that only states that observe their obligations under the NPT and the safeguards agreements may be eligible for participation. In the United States there are therefore demands that Tehran be excluded until further notice from multilateral initiatives.[47] On the other hand, applying weaker standards to Iran than other states would risk watering down the principles on which the multinational fuel guarantee models are based.

A similar problem could arise if a long-term agreement contained arrangements for future cooperation in the civilian nuclear sector, without Tehran permanently ceasing uranium enrichment and reprocessing. The United States has been working for some time to anchor non-proliferation standards in bilateral nuclear trade agreements with non-nuclear-weapon states. The George W. Bush Administration already made the export of American civilian nuclear technology conditional on the recipient foregoing enrichment and reprocessing. Washington concluded the first agreement containing this gold standard with the United Arab Emirates in 2009. The Obama Administration is using a more flexible approach, but is still pursuing the goal of writing the renunciation of uranium enrichment and reprocessing into bilateral agreements.[48]

The JPOA already provides for comprehensive civil nuclear cooperation with Tehran during the implementation of a long-term agreement. That would include the possibility to supply light water reactors to Iran without seeking a complete end to Iranian uranium enrichment.[49] Members of Congress therefore accuse the Obama Administration of watering down its own gold standard.[50] From the non-proliferation perspective it would certainly be desirable for potential supplier states to impose the strictest standards on nuclear trade with Iran.

CSS Analysen zur Sicherheitspolitik 151 (Zurich: Center for Security Studies, ETH Zurich, April 2014), http://www.css.ethz.ch/publications/pdfs/CSSAnalyse151-DE.pdf (accessed 11 July 2104).

45 One reason for delays is that the IAEA has not been able to confirm the geological suitability of the planned facility. "U.N. Agency, Kazakhstan Seen Close to Deal on Nuclear Fuel Bank", *Global Security Newswire*, 19 June 2014, http://www.nti.org/gsn/article/un-agency-kazakhstan-close-deal-nuclear-fuel-bank (accessed 8 July 2014).

46 Sam Nunn, "Open a Nuclear Fuel Bank", *New York Times*, 11 July 2014, http://www.nytimes.com/2014/07/12/opinion/open-a-nuclear-fuel-bank.html?_r=0 (accessed 25 September 2014).

47 GAO, "Nuclear Nonproliferation" (see note 12), 39.

48 Schneider and Thränert, *"Dual Use"* (see note 44).

49 The cooperation is to include the possibility for Iran to purchase modern light water and research reactors, supply of nuclear fuel, and cooperation on research and development.

50 Elaine M. Grossman, "Royce: White House in 'Dramatic Retreat' from Security Norms in Nuclear Trade", *Global Security Newswire*, 10 July 2014, http://www.nti.org/gsn/article/royce-white-house-dramatic-retreat-security-norms-nuclear-trade (accessed 25 September 2014).

Outlook

The Geneva Plan of Action of 24 November 2013 states that a long-term agreement with Iran should "reflect the rights and obligations of parties to the NPT and IAEA Safeguards Agreements".[51] And after it expires the Iranian nuclear programme will be treated no differently than the nuclear programme of any other NPT non-nuclear-weapon state. That would end the special treatment of Tehran.

The outcome of the E3+3 talks – and if an agreement is reached, also the success or failure of a Joint Comprehensive Plan of Action – will also have a decisive influence on broader efforts to control and reduce nuclear weapons. If the negotiations fail on 24 November 2014, there is little hope of strengthening the non-proliferation regime. If twelve years of talks cannot bring Iran back into the multilateral fold, that would be a body-blow for the NPT as a whole. After North Korea's withdrawal in 2003 this would be the second failure to resolve a major proliferation crisis on the basis of international norms, rules and procedures. International pressure would probably lead Iran to become a "spoiler" in the non-proliferation regime once again.[52] Under such circumstances the next NPT review conference in 2015 would probably become largely a damage-limitation exercise concerned with reducing Tehran's influence and avoiding a repeat of the 2005 failure to produce a final document.

If, on the other hand, the negotiations are extended beyond 24 November 2014, that could play a role in making Iran more cooperative than at the last two review conferences. That would still apply if the E3+3 and Iran agreed on certain elements but continued to talk on points of controversy. In that case the NPT members should highlight and confirm the progress already achieved.

A long-term agreement resolving the nuclear conflict would be the best precondition for a successful review conference and for all efforts to strengthen the non-proliferation regime. Such an outcome would demonstrate that the existing mechanisms possess the potential to resolve important and complex non-proliferation crises.

In that event, there would be no reason why Iran could not act as a responsible non-nuclear-weapon state. In fact, in order to avoid being "singled out" or appearing to make one-sided concessions, it might even be interested in generalising a number of the special obligations imposed upon it. Despite radical rhetoric, Tehran has in the past occasionally cooperated in promoting arms control regimes. For Tehran, the role of a "fundamentalist norm renovator" could offer a way out of the legitimacy dilemma that looms if it continues to express fundamental criticism of double standards in the non-proliferation regime yet at the same time accepts certain aspects of that regime when implementing a long-term agreement.[53]

The signing of a comprehensive agreement would also be a confirmation of the European and German policies, which have always upheld the objective of a diplomatic solution.[54] The chances of strengthening cooperative non-proliferation efforts and thus effective multilateralism would be greatest if Iran were willing to support such efforts – or at least not stand in their way.

A long-term agreement would probably be implemented over several years. Building on the Geneva Plan of Action it would in all likelihood include temporary restrictions on the Iranian nuclear programme, special transparency measures and procedures for gradually relaxing sanctions.

51 IAEA, "Communication [...] concerning the text of the Joint Plan of Action" (see note 9).

52 Yvonne Yew, *Diplomacy and Nuclear Non-Proliferation: Navigating the Non-Aligned Movement*, Discussion Paper 2011–7 (Cambridge, MA: Belfer Center for Science and International Affairs, June 2011).

53 Carmen Wunderlich, Andrea Hellmann, Daniel Müller, Judith Reuter and Hans-Joachim Schmidt, "Non-aligned Reformers and Revolutionaries: Egypt, South Africa, Iran and North Korea", in *Norm Dynamics in Multilateral Arms Control*, ed. Müller and Wunderlich (see note 1), 246–295 (271 f.).

54 Oliver Meier, *European Efforts to Solve the Conflict over Iran's Nuclear Programme: How Has the European Union Performed?* Non-Proliferation Papers 27 (N.p.: Non-Proliferation Consortium, February 2013), http://www.nonproliferation.eu/documents/nonproliferationpapers/olivermeier51191b5bdb350.pdf (accessed 25 September 2014).

Ahead of the Ninth NPT Review Conference

An agreement in the nuclear dispute would lend momentum to the upcoming review conference in New York in April/May 2015. That is urgently needed in view of the difficult environment for the four-week meeting. The diplomats will face two main tasks: to assess progress in implementation of the treaty goals, and to agree further measures to strengthen the regime.

The last review conference in 2010 agreed sixty-four measures to strengthen the non-proliferation regime, but little progress has been made on their implementation. The nuclear weapons states have reached no new agreements on reducing the 16,300 nuclear weapons in existence across the world. Russia and the United States, which between them own more than 90 percent, have held no more new disarmament talks since signing the New Strategic Arms Reduction Treaty (New START) in April 2010. The Ukraine crisis further diminished the prospects for treaty-based reductions of US and Russian nuclear arsenals. At the same time, all the nuclear weapons states are investing in the modernisation of their nuclear arsenals, and China is even building more nuclear weapons. At the conference many non-nuclear-weapon states are likely to again sharply criticise this breach of the disarmament promise in Article 6 of the NPT.

Nor have the states parties implemented the decision of the last review conference to hold a conference on a Middle East nuclear- and WMD-free zone by 2012. While the destruction of Syria's chemical weapons represented a step in that direction, civil war in Syria and violence and political instability across other states in the region means there is little prospect of a successful regional dialogue on biological, chemical and nuclear weapons disarmament. In 2013 Egypt walked out of the preparatory committee for the review conference in protest over the lack of progress.[55] At the review conference itself many Middle Eastern states will criticise the omission of Israel's nuclear potential from the agenda.

Iran's neighbours will play an important role at the review conference. Much will depend on how they assess the progress of the nuclear talks. If regional rivals like Saudi Arabia conclude that an agreement fails to offer adequate protections against an Iranian nuclear bomb they are also liable to remain more critical towards a general strengthening of the non-proliferation regime.[56] But if the talks fail and Iran's nuclear programme expands unchecked they are much more likely to turn their backs on the non-proliferation regime.

Strengthening the Non-Proliferation Regime

The talks on Tehran's nuclear programme have highlighted certain areas of non-proliferation where there is particular need for action and others where the prospects for initiatives to strengthen the non-proliferation regime are best.

The Additional Protocol stands at the heart of efforts to improve the IAEA's verification capabilities. The crisis over Iran's nuclear programme has again underlined the value of this instrument. As long as the country refused to implement its Additional Protocol, the IAEA lacked important means to search for undeclared facilities. The additional reporting requirements and access rights anchored in the Protocol were points of reference in the talks with Tehran.

The EU member-states and other Western countries have worked – to date unsuccessfully – to make the Additional Protocol the verification standard for all non-nuclear-weapon states.[57] They should not abandon this objective. Today 124 IAEA members implement an Additional Protocol, but a number of states with significant nuclear facilities – like Argentina, Brazil, Egypt, North Korea and Syria – still do not, and refuse to make it the new verification standard.[58] The reasons for this stance have nothing to do with the Iranian nuclear programme. Argentina and Brazil, for example, link acceptance of stricter verification rules to progress on nuclear disarmament, while Egypt insists

55 Elaine M. Grossman, "Egypt Stages Walkout over Failure to Convene Mideast WMD Summit", *Global Security Newswire*, 30 April 2013, http://www.nti.org/gsn/article/egypt-stages-walkout-over-failure-convene-mideast-wmd-summit (accessed 28 July 2014).

56 Yuval Steinitz, "Iran Deal Could Encourage, Rather than Limit, Nuclear Activity", *Washington Post*, 1 March 2014, http://www.washingtonpost.com/opinions/iran-deal-could-encourage-rather-than-limit-nuclear-activity/2014/02/28/74cc36ee-9d71-11e3-9ba6-800d1192d08b_story.html.

57 The final document of the 2010 review conference therefore merely notes that many states regard an Additional Protocol as an integral component of the safeguards system, and calls upon states to implement existing legal requirements. "Final Document of the 2010 Review Conference" (see note 5), paragraph 17 f.

58 The current status of implementation of the Additional Protocol can be found at http://www.iaea.org/safeguards/documents/AP_status_list.pdf (accessed 25 September 2014).

that Israel first join the NPT. So progress is not to be expected here even if the Iranian nuclear conflict is resolved. And were Iran to ratify and implement its Additional Protocol, it might at least have to revise its stance that the instrument is discriminatory.

It would be sensible for the review conference (as in 2010) to call upon those states that have signed but not yet ratified an Additional Protocol to apply the instrument provisionally. Here the Iranian example can have a positive effect.[59] Also in relation to the state-specific approach and a sharper focussing of IAEA verification activities, the Iran story can contribute to improving the prospects for reform initiatives.

The review conference should also reiterate that a comprehensive safeguards agreement provides the IAEA with a mandate to search for undeclared nuclear facilities and materials.[60] Moreover, the states parties could underline the importance of transparency measures for effective monitoring of civilian nuclear programmes. The review conference should also note that early notification of plans to construct new nuclear facilities is a central precondition for effective verification, and confirm that safeguards agreements and subsidiary arrangements apply permanently and cannot be revised unilaterally by the implementing state. The IAEA's expanded powers to investigate possible military dimensions of nuclear programmes in non-nuclear-weapon states should be acknowledged and further action proposed to establish and expand corresponding capabilities.

The nuclear talks with Iran concentrate on measures to limit proliferation-sensitive activities. But the NPT framework offers very few starting points for anchoring such steps multilaterally. A long-term or even permanent renunciation of plutonium reprocessing by Tehran – as proposed in the JPOA – would send an important message: a country with a significant nuclear programme ceasing proliferation-sensitive activities for the sake of confidence-building. In their national statements the states parties should therefore acknowledge cases where NPT members have restricted their nuclear programmes in order to reduce the risk of military misuse. In this connection the review conference could also call for potentially weapons-grade fissile materials to be converted as quickly and comprehensively as possible into less proliferation-sensitive forms.[61] One model would be the Iranian promise to convert uranium hexafluoride into uranium oxide (fuel rods).

The discussion over international nuclear fuel supply guarantees as one element of a solution for the nuclear dispute with Iran has confirmed that pragmatic approaches are the most promising. Yet the linkage of Iran-specific models with a general initiative for creating multinational guarantees has not had any positive impact on the non-proliferation regime – although multinational initiatives to assure Iran's supply of nuclear fuel are still being discussed as part of a package solution.[62] In this connection the review conference should note that a fuel bank administered by the IAEA could contribute to providing non-nuclear-weapon states with a reliable supply of nuclear fuel.

To prevent a watering down non-proliferation standards, the NPT members should emphasise that multinational mechanisms are open only to states that have answered all the IAEA's outstanding questions about their nuclear programmes. But introducing additional conditions for participation would not be helpful, as they would be perceived as paternalism.[63]

Recommendations for German Policy

The actions of the European Union, the E3 and Germany in the nuclear conflict with Tehran are a success story. Europe's early and assertive intervention played a major role in keeping the idea of military strikes against Iran's nuclear facilities off the table internationally. At the same time, German and European influence are also responsible for the debate about monitoring and limiting the Iranian nuclear programme being conducted on the basis of the non-proliferation regime. It is yet to be seen whether this success story will have a happy ending.

One major German contribution should be to place the non-proliferation lessons of the nuclear conflict in the context of an effective multilateralism. It is natural that initiatives to bring Iran back into the internation-

59 "Final Document of the 2010 Review Conference" (see note 5), "Action 28", 25.

60 The final documents of earlier review conferences already contained corrsponding statements; for example "Final Document of the 2010 Review Conference" (see note 5).

61 Such a move could affect the German FRM-II research reactor at Garching, which is operated with highly enriched uranium.

62 Nunn, "Open a Nuclear Fuel Bank" (see note 46).

63 Harald Müller, *Die Stabilität des nuklearen Nichtverbreitungsregimes: Stand und Optionen*, HSFK-Report 11/2009 (Frankfurt: HSFK, 2009), 24.

al system concentrate on measures to verify and limit the country's nuclear programme. But for most NPT states, obligations to strengthen non-proliferation, which apply above all to the non-nuclear-weapon states, are only one side of the deal laid out in the treaty. They therefore also call for progress in nuclear disarmament and for the nuclear weapons states to be more transparent.

Here Germany possesses great credibility, for it has long and consistently pushed for global nuclear disarmament and for greater transparency over existing arsenals. As well as the general actions described above, a number of specific recommendations for German non-proliferation policy can also be derived:

- Germany should argue for the negotiations over a long-term agreement with Tehran to be used also to strengthen *arms control instruments*. Berlin should insist that all participants in the talks between the E3+3 and Iran ratify the Comprehensive Nuclear-Test-Ban Treaty (CTBT). China, Iran and the United States have signed the treaty but not ratified it. All NPT resolutions call for entry into force of this treaty as the most important disarmament measure. Such a step would therefore also contribute to anchoring an agreement with Iran within the NPT.
- The treatment of the Iranian nuclear programme has led to improvements in non-proliferation rules and procedures. In certain cases these could also have the character of precedents. It is therefore important that Iran receives *no special rights or privileges* in the context of a possible long-term solution. This applies in particular to the supply of nuclear technology. Germany has an interest in minimising the number of states acquiring their own enrichment or reprocessing capacities. This can only be achieved on the basis of multilateral rules and if no new double standards are created.
- Germany, as the only non-nuclear-weapon state in the E3+3, bears a special responsibility for *investigation of possible military activities* being comprehensive and sufficiently transparent. The non-nuclear-weapon states in the NPT have a right to hear what progress Iran has made towards the construction of nuclear weapons, who assisted it, and what will happen to the technologies it developed. Germany should push for these questions to be answered after implementation of a possible agreement in such a way that all NPT members can make their own judgement about the outcome of the IAEA investigation.
- Germany should increase its financial support to the IAEA, which has not been exempted from Berlin's general "zero real growth" policy, which rejects growth in the net budgets of international organisations.[64] It should be remembered that fulfilling additional verification responsibilities in Iran under the JPOA costs about €6.5 million for ten months.[65] While it can be assumed that donors with relevant interests will always come forward to fund such one-off tasks, it would make sense to increase the regular budget to a point where the Agency can afford such activities without extra-budgetary contributions. This would also help to defuse accusations that particular members are using instrumentalising the Agency for their own ends.[66]
- Germany should also support strengthening the IAEA's ability to investigate military research. To date it has always created such capacities ad hoc when there was a concrete need. These capacities should be consolidated, especially with an eye to later investigation of cases such as Syria or North Korea. This would deflect the accusation that the IAEA is only called to resolve non-proliferation crises when this appears opportune to the most powerful states.[67]

These steps could also encourage opportunities to strengthen the non-proliferation regime growing out of the Iranian nuclear crisis. Whether it proves possible to make use of these possibilities will depend largely on Tehran. Regardless of the outcome of the nuclear talks, however, one should already be think-

64 In the IAEA's 2013 budget negotiations Berlin did not oppose real growth of 0.3 percent. Between 2011 and 2013 Germany voluntary provided the IAEA with an additional sum of almost €12 million. Stefan Kapferer, "Germany – National Statement: 57th Session of the IAEA General Conference", Vienna, 17 September 2013, http://www.iaea.org/About/Policy/GC/GC57/Statements/germany.pdf (accessed 8 October 2014).

65 Frederik Dahl, "IAEA Says Needs More Money to Monitor Iran Nuclear Deal Extension – Document", *Reuters*, 25 July 2014.

66 Jessica C. Varnum, "Responsible for Verifying Iran Nuclear Deal, IAEA Lacks Reliable Support", *World Politics Review*, 29 January 2014, http://www.worldpoliticsreview.com/articles/13534/responsible-for-verifying-iran-nuclear-deal-iaea-lacks-reliable-support (accessed 30 July 2014).

67 Friedrich Gröning and Wolfgang Rudischhauser, "Die Organe der IAEO und ihr Umgang mit dem Iran und anderen aktuellen Krisen", in *50 Jahre Internationale Atomenergie-Organisation IAEO. Ein Wirken für Frieden und Sicherheit im nuklearen Zeitalter*, ed. Dirk Schriefer, Walter Sandtner and Wolfgang Rudischhauser (Baden-Baden, 2007), 32–57 (45).

ing about measures by which nuclear weapons can be more effectively controlled. The experience with Iran could supply valuable lessons.

Abbreviations

CRS	Congressional Research Service
CSA	Comprehensive safeguards agreement
CSS	Center for Security Studies (Zurich)
CTBT	Comprehensive Nuclear Test Ban Treaty
E3	France, Germany, United Kingdom
E3+3	France, Germany, United Kingdom + China, Russia, United States
FRM II	Forschungsreaktor München II (German research reactor, Garching, Munich)
GAO	U.S. Government Accountability Office
HSFK	Hessische Stiftung Friedens- und Konfliktforschung (Frankfurt am Main)
IAEA	International Atomic Energy Agency (Vienna)
INMM	Institute of Nuclear Materials Management
JPOA	Joint Plan of Action (24 November 2013)
LEU	Low-enriched uranium
NAM	Non-Aligned Movement
NPDI	Non-Proliferation and Disarmament Initiative
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
PMD	Possible military dimension
SWU	Separative work unit
TRR	Tehran Research Reactor
UF6	Uranium hexafluoride
UNMOVIC	United Nations Monitoring, Verification and Inspection Commission
UNSCOM	United Nations Special Commission
VERTIC	Verification Research, Training and Information Centre (London)
WMD	Weapon(s) of mass destruction