

Research Briefing

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By,

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Status of the Iran nuclear deal

It has been over three months since the election of hardline Iranian President, Ebrahim Raisi, and the last round of talks on the Joint Comprehensive Plan of Action (the Iran nuclear deal).

Despite hopes that talks could quickly resume under the new President, Iran has not yet returned to the negotiating table and continues to escalate its nuclear activities, in violation of the deal. The US has indicated that its patience for talks to resume is time limited.

While many view Iran's actions as an attempt to gain leverage in any future discussions, there are concerns that, on its current trajectory, Iran will soon acquire irreversible nuclear knowledge that renders the JCPOA meaningless.

1

What was agreed under the JCPOA?

In 2015 Iran [agreed a deal](#) with China, France, Germany, Russia, the UK and the US (the P5+1) to limit the Iranian nuclear programme in exchange for sanctions relief. In July 2015 the deal was endorsed by [UN Security Council Resolution 2231](#).

The deal was intended to prevent Iran from developing a nuclear weapons programme. It did not include measures on Iranian foreign policy or its ballistic missile programme.

Under the deal:

- Iran agreed to reduce its stockpile of [low-enriched uranium](#) by 98 per cent to 300kg, for a period of 15 years.
- Iran's [centrifuges](#) would only enrich to 3.67 per cent, which was considered enough for civilian nuclear power and research, but well below weapons grade enrichment (90 per cent).¹ That limit on enrichment would be maintained for 15 years.
- The number of centrifuges in operation would be reduced by two thirds.² The Fordow facility would be prohibited from enriching uranium for 15 years and the facility repurposed into a research facility, with Russian assistance. Only limited enrichment would take place at the facility at Natanz. Iran would not build any new enrichment facilities for 15 years. The heavy water reactor at Arak which was capable of producing weapons grade plutonium, would be redesigned so that it could not produce spent fuel.
- Iran agreed to provisionally implement the Additional Protocol to its Safeguard Agreement with the International Atomic Energy Agency (IAEA).³

In exchange, all nuclear-related sanctions would be lifted. Under the agreement, however, non-compliance could see sanctions automatically reintroduced (the snapback provisions).

The deal is overseen by a Joint Commission comprising the signatories of the agreement and the EU. The Commission is chaired by EU High Representative Josep Borrell. Iran's compliance with the JCPOA is monitored and verified by the [International Atomic Energy Agency](#) (IAEA).

During his 2016 Presidential campaign Donald Trump made it clear that withdrawing the US from the deal would be one of his top foreign policy priorities. Despite Iran's verified compliance with the agreement by the IAEA, [the US withdrew from the deal](#) in 2018 and reimposed all US sanctions. The remaining signatories to the JCPOA did not follow suit.

¹ Uranium enriched to 20 per cent can be used in research reactors. Further enrichment to 90 per cent produces weapons grade uranium. The enrichment process to get from 0.7 per cent to 20 per cent takes much more technological effort than the process to get from 20 per cent to 90 per cent.

² From 19,000 to 6,104. Only 5,060 of the remaining centrifuges would be allowed to enrich uranium over the next ten years. Excess centrifuges would be dismantled and stored under IAEA monitoring.

³ The Additional Protocol gives the IAEA the right to make short notice inspections to sites not previously declared as nuclear, including military sites.

2

Iranian non-compliance with the deal

Since May 2019 Iran has incrementally violated the terms of the agreement. The Iranian Government has linked those violations to the failure of the deal to deliver sanctions relief, and by default the US decision to withdraw and reimpose sanctions.

At the beginning of January 2020, the Iranian Government went one step further and announced that it would no longer abide by any of its commitments under the JCPOA. As a result, there would be no restrictions on Iran's uranium stockpile or enrichment programme going forward and its nuclear programme would "be developed solely based on its technical needs".⁴ The announcement fell short of a total withdrawal from the deal, however, as Iran confirmed that it would continue its co-operation with the IAEA and allow IAEA inspectors access to its sites. It also stated that it would return to its obligations under the JCPOA if sanctions were lifted.

On 14 January 2020 the E3 (UK, France and Germany) referred the matter to the Joint Commission of the JCPOA.

2.1

Iran's new nuclear laws

In December 2020 the Iranian Parliament and Guardian Council [passed legislation](#) requiring the Government to speed up its resumption of nuclear activities if sanctions relief was not forthcoming by 21 February 2021. Specifically, it mandated:

- The production of up to 120kg of uranium, enriched to 20 per cent, per year.
- An increase in the monthly rate of production of enriched uranium (at varying levels of enrichment), by a minimum of 500kg.
- The installation of at least 1,000 advanced centrifuges by the end of March 2021.
- The operation of a metallic uranium factory at Isfahan by May 2021.
- Renewal of the heavy water reactor at Arak.

The law also provided for Iran to suspend implementation of the Additional Protocol and to reduce cooperation with the IAEA beyond what is in Iran's Safeguards Agreement.

On 23 February Iran subsequently suspended implementation of the Additional Protocol. The IAEA and the Atomic Energy Organisation of Iran

⁴ [Statement of the Atomic Energy Organisation of Iran](#), 5 January 2020

“Since 23 February 2021, the Agency’s verification and monitoring activities have been seriously undermined as a result of Iran’s decision to stop the implementation of its nuclear-related commitments under the JCPOA, including the Additional Protocol”.

IAEA Director General, 7 September 2021

(AEOI) did reach a [temporary technical agreement](#) that would allow for the IAEA to continue its monitoring activities for up to three months. The agreement was [subsequently extended](#) until 24 June 2021.

However, that agreement has now expired, and no further technical discussions have been held. The Iranian Ambassador to the IAEA had said that Iran was [“not required to comply”](#) with any IAEA requests relating to renewal of the agreement.

Concern over the lack of verification of Iran’s activities, and the ability to maintain [“continuity of knowledge”](#) has seen a renewed diplomatic push by the Director General of the IAEA. In [a Joint Statement](#) on 12 September 2021, the IAEA and AEOI subsequently agreed to allow IAEA inspectors to service monitoring equipment and replace data storage, although it did not go so far as to resume inspections. The IAEA will also only be able to access any data collected once the JCPOA is restored. The Head of the IAEA, Rafael Grossi, called developments with Iran [“constructive”](#). However, only two weeks after the agreement was reached [the IAEA issued a report of non-cooperation by the Iranian government](#). In response the E3 (the UK, France and Germany) called on Iran to make [“tangible and rapid progress”](#) and have said they will consult with partners over any appropriate action.⁵

1 Timeline of Iranian breaches

May 2019 – Iran lifts limits on its stockpile of enriched uranium and heavy water. The IAEA verifies that it surpassed those limits on 1 July 2019.

July 2019 – Begins enriching uranium to 4.5 per cent, beyond the 3.67 per cent cap.

September 2019 – Lifts limits on the research and development of centrifuge technology and begins to install more advanced centrifuges at Natanz.

November 2019 – Resumes enrichment at the Fordow nuclear facility.

January 2020 – Lifts limits on the number of centrifuges in operation, the last operational restriction on the development of its nuclear programme.

December 2020 – Iran informs the IAEA of its intention to continue research and development into the production of uranium metal. Reportedly for the Tehran Research Reactor which produces medical isotopes, uranium metal is widely considered to have limited civilian use but is applicable to nuclear weapons development.

⁵ [E3 statement on IAEA verification and monitoring in Iran](#), September 2021

January 2021 – Following the passing of [Iran’s new nuclear laws](#) in December 2020, Iran starts enriching uranium to 20 per cent.

23 February 2021 – [Iran suspends implementation of the Additional protocol](#) to Iran’s safeguards agreement and reduces cooperation with the IAEA.

April 2021 – Iran informs the IAEA it will begin [enriching uranium to 60 per cent](#), following an [attack on the Natanz nuclear facility](#) where Iran has been installing new advanced centrifuges.

August 2021 – [The IAEA verifies that Iran has produced a small quantity of uranium metal](#), enriched to 20 per cent, which it concludes is not suitable for medical research purposes.

How close is Iran to getting a nuclear weapon?

Iran is no longer observing any restrictions on either its production and stockpile of enriched uranium, or the level to which it will enrich uranium. Both these limits were designed to lengthen the time it would take Iran to produce enough fissile material (weapons grade uranium) for a nuclear warhead.⁶

Disregarding those limits significantly reduces Iran’s “breakout” time. This is particularly relevant to Iran’s efforts to build a sufficient stockpile of uranium enriched to 20 per cent, which then requires a significantly lower amount of separative work to reach weapons grade. As an article in Foreign Policy in July 2021 observed: “20 percent enrichment represents nine-tenths of the effort to achieve weapons-grade purity”.⁷ Iran’s move toward attaining 60 per cent enrichment has [no feasible civilian purpose](#).

Under the terms of the JCPOA Iran’s breakout time had been [estimated at one year](#). The time it could take Iran to produce enough fissile material for nuclear weapons is now [estimated at a few months](#).

As of 30 August 2021, the IAEA estimated Iran’s total enriched uranium stockpile to be 2441.3 kg. Of that stockpile:

- 503.8kg enriched to 2 per cent (- 864.1kg from the [previous quarterly report in May 2021](#))⁸
- 1774.8kg enriched to 5 per cent (+ 1.6kg)
- 84.3kg enriched to 20 per cent (+21.5kg)

Iran’s breakout estimate: 2-3 months

Jane’s Intelligence Briefing, 11 February 2021

⁶ Estimates vary, but a first-generation warhead is generally thought to require approximately 15kg of HEU or 5-6kg of plutonium ([International Panel on Fissile Materials](#)).

⁷ “[Is Iran bluffing about its enriched uranium stockpile?](#)”, Foreign Policy, 28 July 2021

⁸ A decrease due to the amount of uranium at 2 per cent that has been used to enrich to 5 per cent (para.54)

- 10kg enriched to 60 per cent (+7.6kg).⁹

However, as analysts at Jane's have pointed out, an estimate of breakout time does not account for the technological capability and time required to build a deliverable nuclear warhead:

The Breakout Estimate is not intended to say when Iran will actually field a nuclear bomb. It is used merely to state how long it would take Tehran to acquire enough WGU for a single nuclear weapon. Once Iran has enough Weapons Grade Uranium for a nuclear bomb there are many other factors that the country will need to address before it actually builds one. First, there are the technical issues of actually weaponizing the WGU into a warhead that will perform reliably, as well as then mating it to a strategic delivery vehicle like the Shahab-3 ballistic missile.¹⁰

Any breakout estimate is also considered a “technical estimate” and does not address the political will to proceed toward weaponisation, or the potential impact of likely pre-emptive actions by an external actor such as Israel.¹¹

Iran still maintains that its nuclear programme is for peaceful purposes¹² and that all activities initiated in the last two years are reversible if sanctions are lifted.

The majority of Iran's JCPOA violations can be reversed, with centrifuges disassembled and facilities closed down or repurposed. Uranium stocks could also be shipped out or blended down. However, it is widely acknowledged that the technical knowledge Iran has acquired, particularly in respect to advanced centrifuge operation and the production of uranium metal cannot be undone and that elements of Iran's nuclear programme are now in fact irreversible.

3 Status of talks

After President Biden indicated his willingness to re-join the JCPOA in early 2021, negotiators held six rounds of talks aimed at restoring the agreement. Progress was considered to have been made under the previous administration of Hassan Rouhani, despite [significant challenges remaining](#), specifically in relation to Iran's recent nuclear advancements, its missile programme and its [regional foreign policies](#).

⁹ IAEA Report of the Director General, [Verification and Monitoring in the Islamic Republic of Iran in light of UN Security Council Resolution 2231](#), 7 September 2021, Para. 55

¹⁰ [Jane's Intelligence Briefing: Iran's Nuclear Programme](#), 11 February 2021

¹¹ Ibid. Israel has, in the past been accused of pre-emptive attacks on Iranian nuclear facilities in order to disrupt their alleged nuclear weapons programme.

¹² [Inauguration speech of President Raisi](#), 3 August 2021

However, a deal was not concluded before Rouhani left office in August 2021. While there was hope that negotiations could resume quickly under the new President, Ebrahim Raisi, to date no further rounds of talks have been held.

President Raisi and Supreme Leader Ayatollah Khamanei, who has the ultimate say on reengagement with the JCPOA, have previously indicated support for the renewal of the nuclear deal, particularly as a means of [easing economic hardship in Iran](#).

However, Raisi has also made clear that the deal must serve “[Iran’s national interests](#)” and as a conservative hardliner, was always expected to adopt a much tougher stance toward the West than his reformist predecessor. He has called for all sanctions to be verifiably lifted prior to Iran returning to compliance and said that [Iran’s ballistic missile programme](#) and regional activities, which are of concern to the West, would not be part of any negotiations. Initially talks had progressed on the basis of incremental, mutual, steps towards compliance and sanctions relief, by both the US and Iran. The Iranian government has also demanded that any return to the deal must include guarantees that a future US administration will not withdraw from the agreement and reinstate sanctions, a position that the US is thought unlikely to accept.¹³

In his address to the UN General Assembly in September 2021 President Raisi reiterated his call for the lifting of all sanctions but did not rule out a return to negotiations.¹⁴ At a meeting on the margins of the UNGA Iranian Foreign Minister, Hossein Amir-Abdollahian, relayed to the EU High Representative and Chair of the JCPOA Commission, Josep Borrell, that Iran was willing to “resume negotiations at an early date”.¹⁵

More recently, however, the Iranian government has demanded that the US release \$10 billion of frozen Iranian funds if it wants Tehran to resume talks.¹⁶

All of Iran’s actions in the last few months would indicate a new Government that is attempting to gain leverage in any future negotiations. However, as has been noted many times, the US’ patience for talks to resume is not limitless and the advances in nuclear knowledge that Iran is acquiring while talks are stalled, will at some point render the benefits of returning to the JCPOA meaningless. Speaking after the UN General Assembly meeting US Secretary of State, Antony Blinken, reiterated:

We have been very sincere and very steadfast in pursuing a path of meaningful diplomacy to get back to mutual compliance with the JCPOA, and also to address the full range of concerns that we and many other countries have with Iran. We continue to believe that a return to mutual compliance with the agreement is in our interest. It’s the best available

¹³ Dr Tobias Borck, “[The E3’s post-JCPOA role on Iran](#)”, RUSI Commentary, 23 September 2021

¹⁴ “[Iran’s President slams US in first speech to UN as leader](#)”, Associated Press, 22 September 2021

¹⁵ [EU External Action Service press release](#), 22 September 2021

¹⁶ “[Iran told US to unblock \\$10 billion to start nuclear talks](#)”, Bloomberg, 3 October 2021

option to restrict Iran’s nuclear program and to provide a platform to address its other destabilizing activities.

But as I’ve said on a few occasions recently, that possibility of getting back to mutual compliance is not indefinite. And the challenge right now is that with every passing day, as Iran continues to take actions that are not in compliance with the agreement – particularly building larger stockpiles of highly enriched uranium to 20 percent, even to 60 percent, and spinning faster centrifuges – we will get to a point at some point in the future at which simply returning to mutual compliance with the JCPOA will not recapture the benefits of the agreement because Iran will have made too much progress in its program that would not be reversed simply by returning to the terms of JCPOA.¹⁷

The US has not given any indication of when that threshold might be crossed, but several observers fear that while Raisi “may believe he is building leverage”, if Iran’s nuclear activities continue on their current path “he risks overplaying Iran’s hand”.¹⁸

If the deal is to survive then compromise on both sides will be required. If diplomacy fails, however, the return of international sanctions, a rapid expansion of Iranian nuclear activity and a heightened risk of military tension in the region are considered likely outcomes.

3.1 UK position on the JCPOA negotiations

The Government’s priority is to find “a diplomatic way forward” and to bring all sides back into compliance with their JCPOA commitments.¹⁹ However, the Government has repeatedly stressed that “time is on no one’s side.”²⁰

In a speech to the UN Security Council at the end of June 2021, the UK’s Ambassador to the UN, Barbara Woodward, expressed concern over Iran’s continued violations of the JCPOA “including the escalatory steps taken since January 2021”. She suggested that such steps collectively “present a significant nuclear proliferation risk” and have “irreversible consequences for Iran’s nuclear capabilities”, thereby undermining the benefits of the nuclear deal. As such, she could not guarantee that “the same terms for a deal will be on offer later in the year”.²¹

A statement by the E3 in August 2021 expressed concern that:

¹⁷ [Remarks by Secretary Antony Blinken at a press briefing during UNGA76](#), 23 September 2021

¹⁸ [“IAEA report raises serious concerns about monitoring”](#), Arms Control Association Blog, 8 September 2021

¹⁹ PQ21899, [Iran: nuclear power](#), 29 June 2021

²⁰ [IAEA report on Iran producing enriched uranium metal: E3 statement](#), 6 July 2021

²¹ [Foreign, Commonwealth and Development Office press release](#), 30 June 2021

While refusing to negotiate, Iran is instead establishing facts on the ground which make a return to the JCPOA more complicated.²²

In September 2021 the Foreign Secretary, Liz Truss, met with her Iranian counterpart, Hossein Amir-Abdollahian, and urged Iran to “return rapidly to the JCPOA negotiations in Vienna with a view to all sides coming back into compliance and reducing tensions over Iran’s nuclear programme”.²³

2 Suggested reading

- [“Preparing for Plan B with Iran”](#), RUSI Commentary, 6 October 2021
- [“Alternatives to failed nuclear diplomacy with Iran”](#), RUSI Newsbrief, 24 September 2021
- [“The E3’s post-JCPOA role on Iran”](#), RUSI Commentary, 23 September 2021
- [“Iran and US still far apart on reviving the JCPOA”](#), IISS Analysis, 23 August 2021
- Anthony Cordesman, [Iran and US strategy: looking beyond the JCPOA](#), 20 July 2021
- [“Can a credible nuclear breakout time with Iran be restored?”](#), Carnegie Endowment for International Peace, 24 June 2021
- [“Where’s Europe on the Iran nuclear deal?”](#), Carnegie Europe, 16 February 2021

²² [E3 statement on the JCPOA](#), 19 August 2021

²³ [Foreign, Commonwealth and Development Office press release](#), 22 September 2021

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