

II. Implementation of the Joint Comprehensive Plan of Action on Iran's nuclear programme

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The Joint Comprehensive Plan of Action (JCPOA) is a landmark agreement concluded on 14 July 2015 by Iran on one side and, on the other, three European states—France, Germany and the United Kingdom (the E3)—and China, Russia and the United States. The agreement appeared to solve the crisis over Iran's nuclear programme that had begun in the early 2000s. The JCPOA, which was facilitated by the European Union (EU), was based on a compromise whereby Iran accepted limits and strict monitoring on its proliferation-sensitive activities in return for the lifting of international sanctions on its nuclear programme.¹

The JCPOA has been significantly weakened since US President Donald J. Trump withdrew the USA from the agreement in May 2018 and reimposed nuclear-related and other additional sanctions on Iran. As most of the reimposed US sanctions are secondary sanctions aimed at third parties, they also undermined the ability of other JCPOA participants to fulfil their commitments under the agreement. Iran responded by gradually reducing adherence to its commitments under the agreement in May 2019, and by January 2020 it had ceased to observe its operational limits.² Iran nevertheless remained a participant in the JCPOA—despite ever harsher US sanctions and growing domestic pressure—and continued to maintain that it would return to full compliance as soon as the other participants did the same.³

This section reviews developments related to the JCPOA in 2020. It focuses on Iran's nuclear activities, particularly those that exceeded the JCPOA limits, based on verification reports by the International Atomic Energy Agency (IAEA). It then describes US sanctions and other efforts related to the Trump administration's 'maximum pressure' policy on Iran, as well as the roles of the other JCPOA participants.

¹ Joint Comprehensive Plan of Action (JCPOA), 14 July 2015, Vienna, reproduced as annex A of UN Security Council Resolution 2231, 20 July 2015. For background see Rauf, T., 'Resolving concerns about Iran's nuclear programme', *SIPRI Yearbook 2016*, pp. 673–88; Rauf, T., 'Implementation of the Joint Comprehensive Plan of Action in Iran', *SIPRI Yearbook 2017*, pp. 505–10; Erästö, T., 'Implementation of the Joint Comprehensive Plan of Action in Iran', *SIPRI Yearbook 2018*, pp. 337–45; Erästö, T., 'Implementation of the Joint Comprehensive Plan of Action', *SIPRI Yearbook 2019*, pp. 378–86; and Erästö, T., 'Implementation of the Joint Comprehensive Plan of Action', *SIPRI Yearbook 2020*, pp. 418–26.

² See Erästö, *SIPRI Yearbook 2020* (note 1).

³ Islamic Republic News Agency (IRNA), 'Iran takes final step by abandoning JCPOA restrictions', 5 Jan. 2020.

Iran's compliance with its JCPOA commitments

The JCPOA sets limits on Iran's uranium enrichment activities, its stockpiles of enriched uranium, and its production of plutonium in order to prevent it from obtaining weapon-grade fissile materials—highly enriched uranium (HEU) and plutonium. Sensitive materials—excess stockpiles of enriched uranium and heavy water, as well as spent nuclear fuel—were to be shipped abroad under the agreement. Iran also agreed to provisionally apply the Additional Protocol to its Comprehensive Safeguards Agreement with the IAEA pending parliamentary ratification, which Iran would seek by 2023. This meant that Iran would accept additional inspections by the IAEA outside the declared nuclear facilities normally covered under the Safeguards Agreement.⁴

Iran had exceeded most JCPOA limits by January 2020, meaning that it was no longer observing key provisions of the agreement. According to Iran, its actions were in line with articles 26 and 36 of the JCPOA, which state that Iran can 'cease performing its commitments . . . in whole or in part' in response to a reimposition of nuclear-related sanctions.⁵ Iran argued that it would return to full compliance once other JCPOA participants did the same by meeting their respective commitments regarding the lifting of sanctions.⁶ At the same time, Iran's nuclear activities continued to be closely monitored and verified by the IAEA throughout the year, although there were some disagreements over access to undeclared locations.

Activities related to heavy water and reprocessing

Iran is constructing a new heavy water reactor at Arak, western Iran. As part of the JCPOA, Iran agreed to redesign this reactor to minimize the amount of plutonium in the spent nuclear fuel that it would produce, and to keep its stock of heavy water below 130 tonnes (reduced to 90 tonnes after commissioning).⁷ It also agreed not to reprocess spent fuel from any of its reactors, with the sole exception of producing medical and industrial radioisotopes.⁸ As in previous years, in 2020 the IAEA reported that Iran had neither pursued the construction of the Arak reactor based on its original design nor carried out activities related to reprocessing at the Tehran

⁴ Arms Control Association, 'IAEA safeguards agreements at a glance', Fact sheet, June 2020.

⁵ JCPOA (note 1), articles 26, 36.

⁶ Islamic Republic News Agency (note 3).

⁷ JCPOA (note 1), annex I.

⁸ JCPOA (note 1), annex I.

Research Reactor (TRR).⁹ However, Iran slightly exceeded the heavy water stock limit in February and May, as it had done in November 2019.¹⁰

Activities related to enrichment and fuel

Under the JCPOA, Iran agreed not to enrich uranium beyond 3.67 per cent of the isotope uranium-235—the minimum level needed for civilian power production. For military use, uranium would need to be enriched up to about 90 per cent.¹¹ It also agreed to maintain its enriched uranium stockpiles below 300 kilograms and to conduct enrichment activities only at the Fuel Enrichment Plant (FEP) at Natanz, Isfahan province, until 2030. In addition, Iran agreed to keep the number of its operating IR-1 centrifuges at the Natanz FEP below 5060 until 2025, while all non-operational centrifuges would remain in storage. The Fordow Fuel Enrichment Plant (FFEP) at Fordow, Qom province, was to be converted into a nuclear, physics and technology centre.¹²

In 2020 the IAEA reported that Iran continued to enrich uranium up to 4.5 per cent, as it had done since July 2019, and that enrichment activities continued at the FFEP, as had been the case since November 2019.¹³ Iran's low enriched uranium stockpile kept growing, from about 1000 kg in February to almost 2500 kg in November.¹⁴

The number of operating IR-1 centrifuges at the FEP remained below 5060 during 2020. However, from March the IAEA reported that an additional 1057 IR-1 centrifuges had been installed at Fordow, with most of them enriching uranium.¹⁵ In October the IAEA also verified the instalment of the more advanced IR-2 and IR-4 centrifuges at Natanz. In November the agency reported that Iran was using the IR-2 centrifuges to enrich uranium, alongside the IR-1 centrifuges permitted by the JCPOA.¹⁶

Centrifuge research and development, manufacturing and inventory

While the JCPOA only permits Iran to operationally enrich uranium using first-generation, IR-1 centrifuges, it nevertheless allows limited research

⁹ IAEA, Board of Governors, 'Verification and monitoring in the Islamic Republic of Iran in light of United Nations Security Council Resolution 2231 (2015)', Report by the Director General, GOV/2020/5, 3 Mar. 2020; GOV/2020/26, 5 June 2020; GOV/2020/41, 4 Sep. 2020; and GOV/2020/51, 11 Nov. 2020.

¹⁰ IAEA, GOV/2020/5 (note 9); and IAEA, GOV/2020/26 (note 9).

¹¹ On enrichment of uranium and reprocessing of plutonium see chapter 10, section X, in this volume.

¹² JCPOA (note 1), annex I.

¹³ IAEA, GOV/2020/5 (note 9); and IAEA, GOV/2020/26 (note 9).

¹⁴ IAEA, GOV/2020/5 (note 9); and IAEA, GOV/2020/51 (note 9).

¹⁵ IAEA, GOV/2020/5 (note 9); IAEA, GOV/2020/26 (note 9); IAEA, GOV/2020/41 (note 9); and IAEA, GOV/2020/51 (note 9).

¹⁶ IAEA, 'Verification and monitoring in the Islamic Republic of Iran in light of United Nations Security Council Resolution 2231 (2015)', Report by the Director General, 17 Nov. 2020, GOV/INF/2020/16.

and development (R&D) activities on more advanced (IR-4, IR-5, IR-6 and IR-8) centrifuges. However, no enriched uranium may be accumulated from these activities. The agreement also allows mechanical testing (typically not involving uranium) on up to two single centrifuges of other types.¹⁷ The limits on centrifuge R&D were intended to be in place until 2025.

In all four quarterly reports of 2020, the IAEA noted that Iran continued to accumulate enriched uranium at the Pilot Fuel Enrichment Plant (PFEP) at Natanz, as it had done since September 2019, using IR-2m, IR-4, IR-5 and IR-6, IR-6s and IR-s centrifuges.¹⁸ The new centrifuge types are more effective than the IR-1 model, which Iran had previously planned to replace only after the expiry of JCPOA limits.¹⁹

On 2 July a centrifuge-assembly workshop at the Natanz nuclear facility caught fire in what Iranian authorities believed to be an act of sabotage.²⁰ The incident hindered Iran's ability to produce new centrifuges and prompted the construction of a new underground assembly facility at Natanz.²¹ While this development was not discussed in the IAEA reports on implementation of the JCPOA, in a November press briefing the agency's director general, Rafael Grossi, confirmed that Iran had begun operating centrifuges at a new location in Natanz.²²

Transparency, the Additional Protocol and other issues

The IAEA's quarterly reports reconfirmed that Iran continued to facilitate inspection and monitoring and to apply the Additional Protocol, and that the agency continued to evaluate Iran's declarations under the protocol.²³

The reports also referred to ongoing interactions related to particles of natural uranium detected in February 2019 at a location that Iran had not formally declared to the IAEA as being associated with its nuclear programme.²⁴ Separate IAEA reports on Iran's Safeguards Agreement and Additional Protocol shed light on the contentious nature of this issue, which was related to Iran's past nuclear activities and was thus not directly connected with the JCPOA. According to the reports, in July and August 2019

¹⁷ See JCPOA (note 1), annex I.

¹⁸ IAEA, GOV/2020/5 (note 9); IAEA, GOV/2020/26 (note 9); IAEA, GOV/2020/41 (note 9); and IAEA, GOV/2020/51 (note 9).

¹⁹ Atomic Energy Organization of Iran (AEOI), 'AEOI deputy elaborates on the JCPOA commitment reduction, third step details', Iran Watch, 21 Sep. 2019; and Hafezi, P., 'Iran launches more advanced machines to speed up nuclear enrichment—official', Reuters, 4 Nov. 2019.

²⁰ 'Iran nuclear: Fire at Natanz plant "caused by sabotage"', BBC News, 23 Aug. 2020.

²¹ 'New building started "in the heart of the mountain" near uranium-enrichment facility in Iran', Radio Free Europe/Radio Liberty, 8 Sep. 2020.

²² 'IAEA confirms reports that Iran has been operating nuclear centrifuges', Voice of America, 18 Nov. 2020.

²³ IAEA, GOV/2020/5 (note 9); IAEA, GOV/2020/26 (note 9); IAEA, GOV/2020/41 (note 9); and IAEA, GOV/2020/51 (note 9).

²⁴ IAEA, GOV/2020/41 (note 9). See also Erästö, *SIPRI Yearbook 2020* (note 1), p. 422.

the IAEA had first requested clarification on three undeclared locations in Iran suspected of having hosted nuclear material and activities prior to 2003.²⁵ From January 2020 the agency had also requested access to two of those locations to take environmental samples.²⁶ The IAEA viewed Iran's initial refusal to grant access as 'adversely affecting' the agency's ability to resolve the relevant questions. This prompted the IAEA Board of Governors to adopt an E3-sponsored resolution on 19 June that called on Iran to 'fully cooperate with the Agency and satisfy the Agency's requests without any further delay'.²⁷

Following a high-level meeting between the IAEA and Iranian officials in August, the agency was able to visit the two sites.²⁸ However, the IAEA found the additional information and explanations provided by Iran in October and November regarding the uranium particles to be 'not technically credible'. In its November report, it argued that 'the presence of multiple uranium particles ... at a location not declared to the Agency still needs to be fully and promptly explained by Iran'.²⁹

The US sanctions on Iran

In 2020 the Trump administration continued to increase sanctions on Iran as part of the 'maximum pressure' policy adopted after the US withdrawal from the JCPOA. The stated objective of the policy was to force Iran to accept a new agreement, with the goal of ending all uranium enrichment in the country and limiting its missile programme and regional activities.³⁰

As in 2019, some of the new US sanctions measures directly targeted international nuclear cooperation under the JCPOA. On 29 May 2020 the USA announced that it would revoke the remaining JCPOA-related sanctions waivers, which had enabled international cooperation on redesigning the Arak reactor, the supply of fuel for the TRR, and the export of spent and scrap fuel from that reactor. Two officials of the Atomic Energy Organization of Iran (AEOI) were also added to the Specially Designated Nationals and Blocked Persons List (SDN List) maintained by the US Department of the Treasury.³¹

²⁵ IAEA, GOV/2020/5 (note 9); and IAEA, GOV/2020/26 (note 9).

²⁶ IAEA, GOV/2020/5 (note 9).

²⁷ IAEA, Board of Governors, 'NPT safeguards agreement with the Islamic Republic of Iran', Resolution, GOV/2020/34, 19 June 2020, para. 4.

²⁸ IAEA, 'NPT safeguards agreement with the Islamic Republic of Iran', Report by the Director General, GOV/2020/47, 4 Sep. 2020.

²⁹ IAEA, GOV/2020/51 (note 9), para. 38.

³⁰ Erästö, *SIPRI Yearbook 2020* (note 1).

³¹ US Department of State, Office of the Spokesperson, 'This week in Iran policy', Fact sheet, 29 May 2020.

Two elements related to UN sanctions on Iran came into play later in the year. UN Security Council resolution 2231, which endorsed the JCPOA and terminated previous UN sanctions related to Iran's nuclear programme, mandated that the conventional arms embargo on Iran would expire on 18 October 2020.³² In line with the JCPOA, Resolution 2231 also allowed any participant in the agreement, following good-faith efforts to address its compliance concerns, to demand a UN Security Council vote on whether the termination of sanctions on Iran should continue. Given their veto right, in practice this 'snapback clause' meant that any of the five permanent members of the Security Council—China, France, Russia, the UK and the USA (the P5)—could trigger the reimposition of all of the UN sanctions on Iran.³³ In August the Security Council first rejected a resolution drafted by the USA that would have extended the conventional arms embargo on Iran beyond 18 October.³⁴ In response, on 20 August the USA announced that it would trigger the JCPOA snapback mechanism and claimed that it entered into force one month later, on 20 September.³⁵

Reflecting an unprecedented legal controversy within the Security Council, all but one of its other members (the exception being the Dominican Republic) rejected the validity of the US claim on the basis that the snapback mechanism could only be triggered by a JCPOA participant.³⁶ In a joint statement on 20 September, the E3 argued that the snapback mechanism was 'incapable of having legal effect' as the USA had ceased to be a participant in the JCPOA in 2018.³⁷ Russia, too, argued that the US measures 'cannot have any effect in terms of international law', stressing that 'Resolution 2231 remains in force, unaltered'.³⁸ China, for its part, characterized the US claim regarding the sanctions snapback as 'nothing but a political show' that 'receives no support of the Security Council members and no acknowledgment of the international community'.³⁹ The firm positions of the other JCPOA members arguably contributed to Iran's decision not to respond to

³² Statement by China, France, Germany, Russia, the UK, the USA and the EU, 16 July 2015, annex B of UN Security Council Resolution 2231 (note 1), para. 5. On the arms embargo see also chapter 14, section II, in this volume.

³³ JCPOA (note 1), articles 36–37; and UN Security Council Resolution 2231 (note 1), paras 11–12.

³⁴ Schwirtz, M., 'UN Security Council rejects US proposal to extend arms embargo on Iran', *New York Times*, 14 Aug. 2020.

³⁵ Pompeo, M. R., US Secretary of State, 'The return of UN sanctions on the Islamic Republic of Iran', Press statement, US Department of State, 19 Sep. 2020.

³⁶ 'UN Security Council rejects US demand to "snapback" sanctions on Iran', *Deutsche Welle*, 26 Aug. 2020.

³⁷ French Ministry for Europe and Foreign Affairs, 'Iran—JCPOA—Joint statement by the foreign ministers of France, Germany and the United Kingdom', 20 Sep. 2020.

³⁸ Russian Ministry of Foreign Affairs, 'Foreign Ministry statement on the misleading assertions by the United States on the return of the previously terminated UN Security Council sanctions on Iran', 20 Sep. 2020.

³⁹ Chinese Permanent Mission to the UN, 'Spokesperson's comment on US demand for snapback on Iran in the Security Council', 20 Aug. 2020.

the US measures. Instead, thanking the other Security Council members for ‘supporting Iran’, Iran argued that ‘the maximum US pressure against the Iranian nation’ had ‘turned into the maximum isolation of the United States’.⁴⁰

In October the USA imposed sanctions on the remaining 18 Iranian banks which had not previously been so targeted. This prompted European criticism that these measures would further complicate humanitarian trade, which was supposed to be outside the scope of US sanctions.⁴¹

The role of other JCPOA participants

In 2019 the E3 states established the Instrument in Support of Trade Exchanges (INSTEX) as part of their efforts to save the JCPOA.⁴² Its initial objective was to counter US sanctions on Iran’s oil exports, but the focus was subsequently reduced to humanitarian trade (e.g. in food and medicine). In principle, humanitarian trade is not covered by US sanctions, but it has nonetheless been affected by them. INSTEX conducted its first pilot transaction in March 2020 but was unable to process further transactions during the year due to US financial sanctions.⁴³

While still acknowledging the negative impact of US sanctions on the JCPOA, in 2020 the focus of the E3 increasingly shifted to condemning Iran’s breaches of its nuclear commitments. On 14 January the E3 announced that they would trigger the JCPOA dispute resolution mechanism (DRM) in response to Iran’s reduced compliance, rejecting the Iranian argument that its actions were in line with the agreement.⁴⁴ In July Iran also sought to address through the DRM what it regarded as the E3’s failure to implement their JCPOA commitments.⁴⁵ Both of these moves were largely symbolic, as the DRM process could ultimately result in the issue being referred to the UN Security Council—an outcome that neither the E3 nor Iran desired since it could have led to a snapback of UN sanctions on Iran.⁴⁶ As Russia argued, the DRM ‘was created for entirely different purposes’, and ‘The reasons that led to complications during the implementation of the JCPOA are well-

⁴⁰ President of Iran, ‘President at the cabinet meeting: US’ definite defeat in imposing UNSC sanctions made Sep. 20 a memorable day in Iran’s diplomacy history’, 20 Sep. 2020.

⁴¹ Hudson, J., ‘Trump administration imposes crushing sanctions on Iran in defiance of European humanitarian concerns’, *Washington Post*, 8 Oct. 2020.

⁴² Erästö, *SIPRI Yearbook 2020* (note 1), p. 423.

⁴³ Norman, L., ‘EU ramps up trade system with Iran despite US threats’, *Wall Street Journal*, 31 Mar. 2020.

⁴⁴ British Government, ‘E3 foreign ministers’ statement on the JCPOA’, Press release, 14 Jan. 2020.

⁴⁵ Tasnim News Agency, ‘Russia blasts E3 for seeking to launch DRM in Iran deal’, 4 July 2020; and Schaart, E., ‘EU says Iran has triggered nuclear deal dispute mechanism’, *Politico*, 4 July 2020.

⁴⁶ Erästö, T. and Cronberg, T., ‘Will Europe’s latest move lead to the demise of the Iran nuclear deal?’, *SIPRI WritePeace Blog*, 21 Jan. 2020.

known and are not linked with Iran'.⁴⁷ Russia condemned the E3's decisions both to trigger the DRM and to push for the IAEA resolution of 19 June as aggravating the situation.⁴⁸ China also criticized these moves by the E3.⁴⁹ It stressed that 'the unilateral and bullying practices' of the USA was the root cause of the problem.⁵⁰

In a statement issued on 7 December, the E3 described Iran's plans to install more advanced centrifuges at the Natanz FEP as 'contrary to the JCPOA'.⁵¹ They also expressed concern about a law passed by the Iranian Parliament on 1 December. This law called for further, immediate expansion of Iran's nuclear programme, notably enriching uranium up to 20 per cent, and an end to the implementation of the Additional Protocol within two months if sanctions relief were not provided by then.⁵² The legislation had been prompted by the assassination on 27 November of Mohsen Fakhrizadeh, an Iranian nuclear scientist who allegedly played a key role in the country's past nuclear weapon programme.⁵³

Looking ahead

The stated intention of the new US president, Joe Biden, to rejoin the JCPOA raised the prospect that the ailing nuclear agreement could still be revived in 2021.⁵⁴ The stakes were raised further by growing pressures within Iran to step up its nuclear programme and, more generally, to abandon the moderate policies of Iranian President Hassan Rouhani, which had failed to deliver on promises of sanctions being lifted under the JCPOA. Given the strict deadlines for sanctions relief set by the Iranian Parliament and the Iranian presidential elections scheduled for June 2021, at the end of 2020 there seemed to be only a narrow window of opportunity for Iran and the USA to stop an escalating nuclear crisis by agreeing on the terms for returning to their respective JCPOA commitments.

⁴⁷ Russian Ministry of Foreign Affairs, 'Comment by the Information and Press Department on the decision of the United Kingdom, Germany and France to formalize the dispute resolution mechanism under the Joint Comprehensive Plan of Action on the Iranian nuclear programme', 14 Jan. 2020.

⁴⁸ Davenport, K., 'IAEA Board presses Iran', *Arms Control Today*, vol. 50, no. 6 (July/Aug. 2020).

⁴⁹ 'China regrets Britain, France, Germany's decision to trigger Iran deal dispute mechanism', *Global Times*, 15 Jan. 2020.

⁵⁰ Davenport (note 48).

⁵¹ Germany Federal Foreign Office, 'E3 statement on the JCPoA: Response to Iranian plans to expand its nuclear programme and restrict access of IAEA monitoring', Press release, 7 Dec. 2020.

⁵² Masterson, J. and Davenport, K., 'Iran passes nuclear law', *Arms Control Now* blog, Arms Control Association, 10 Dec. 2020; and 'Iran will expel UN nuclear inspectors unless sanctions are lifted: Lawmaker', *Reuters*, 9 Jan. 2021.

⁵³ Motamedi, M., 'Iran parliament demands end of nuclear inspections after murder', *Al Jazeera*, 29 Nov. 2020.

⁵⁴ 'Iran Parliament wants nuclear stance hardened after scientist killed', *Radio Free Europe/Radio Liberty*, 1 Dec. 2020.