

The Iran Nuclear Deal: The End of Nonproliferation?

October 18, 2015 was “Adoption Day” for the Iran nuclear deal (the Joint Comprehensive Plan of Action, JCPOA) meaning that the JCPOA has formally taken effect. Iran has yet to begin to implement the JCPOA, saying that it first wants a resolution of the International Atomic Energy Agency’s (IAEA) investigation into its past nuclear weapons program. Since Iran continues to counterfactually claim that it never had such a program, a satisfactory resolution should be difficult. However, it is expected that by December 2015 the IAEA, in order to allow the JCPOA to move forward, will say that it is satisfied by Iran’s false statements and let the matter drop.

The JCPOA has been characterized as a big win for nonproliferation but in fact it has left U.S. nonproliferation policy in shambles. In the quest to get a nuclear deal with Iran at any cost, the JCPOA has legitimized Iran’s illicit centrifuge enrichment program, granting Iran the “right to enrich” and allowing it an unrestricted enrichment program after 15 years. Though Iranian reprocessing was banned under the preliminary November 2013 nuclear deal with Iran (the Joint Plan of Action, JPOA), the JCPOA has also granted Iran the right to reprocess after 15 years. Given these major concessions to Iran it is not clear how the U.S. will be able to prevent the acquisition of nuclear weapons by any country that desires them.

Efforts to prevent the spread of nuclear weapons including IAEA safeguards have focused on attempting to control the nuclear material required for such weapons. Natural uranium consists principally of two types of atoms (isotopes). Most of uranium is U-238 (99.3%) and the remainder is U-235 (0.7%). Only U-235 can be directly used to produce nuclear weapons but to do so its concentration must be increased (enriched) from 0.7% to 80% or more.

A variety of technologies can be used to enrich uranium. The dominant technology in use today is centrifuge enrichment. Commercial nuclear power reactors use uranium that has been enriched to only 3% to 5% so a centrifuge enrichment plant which was designed to produce only such low enriched uranium would seem to be safe but that is not the case. Indeed, even if a centrifuge enrichment plant had the capacity to produce only enough low enriched uranium for just one large nuclear power plant, it could be used to produce enough highly enriched uranium (HEU) for a nuclear weapon in just one week by passing the low enriched uranium back through the plant multiple times (batch recycling).²

It is also possible to use natural uranium to fuel a nuclear reactor using either graphite or heavy water as the moderator. Neutrons produced by the reactor’s operation are captured in the U-238

¹ This paper is the product of the author’s personal research and the analysis and views contained in it are solely his responsibility. Though the author is also a part-time adjunct staff member at the RAND Corporation, this paper is not related to any RAND project and therefore RAND should not be mentioned in relation to this paper. I can be reached at GregJones@proliferationmatters.com

² Gregory S. Jones, “Facing the Reality of Iran as a De Facto Nuclear State: Centrifuge Enrichment and the IAEA February 24, 2012 Safeguards Update,” March 22, 2012, Appendix 2, http://www.npolicy.org/article_file/Facing_the_Reality_of_Iran_as_a_De_Facto_Nuclear_State.pdf

which is converted into plutonium. Once the plutonium has built up to the desired concentration the fuel is discharged. After some months to allow some of the radioactivity to decay the fuel is chemically processed (reprocessed) to extract the plutonium which can be used to manufacture nuclear weapons. Iran's Arak reactor was intended to be such a reactor. Reactors using low enriched uranium, such as commercial power reactors or Iran's Arak reactor as modified by the JCPOA, also produce plutonium which can be used for nuclear weapons.

To prevent countries from acquiring HEU and/or plutonium for nuclear weapons it is necessary to prohibit nonnuclear weapon states from possessing centrifuge enrichment and reprocessing. The U.S. has followed such a policy intermittently and inconsistently. On the one hand, it has prohibited South Korea from reprocessing the spent fuel from its nuclear power reactors and forced Taiwan to shut down a small natural uranium fueled heavy water reactor. Taiwan was required to export the plutonium-containing fuel to the U.S. The U.S. has also signed a nuclear cooperation agreement with the United Arab Emirates prohibiting it from having enrichment and reprocessing (the so-called gold standard).

On the other hand, the U.S. has allowed Japan to reprocess the spent fuel from its nuclear power reactors and amass a nearly 11 metric ton plutonium stockpile. The U.S. has not attempted to shut down Brazil's centrifuge enrichment program even though it is too small to provide sufficient enriched uranium fuel for its power reactors and the little fuel that it does produce is far more costly than what can be purchased commercially. However, Brazil's centrifuge enrichment program is just the right size to provide HEU for nuclear weapons.

Iran's centrifuge enrichment technology was developed as part of Iran's nuclear weapons program and involved violations of IAEA safeguards. Yet the JCPOA has legitimized Iranian centrifuge enrichment by granting Iran the right to enrich. If Iran, which has violated its IAEA safeguards by conducting clandestine centrifuge enrichment and defied multiple U.N. Security Council resolutions demanding that it halt centrifuge enrichment, has been allowed to retain this capability, on what basis can any country that has abided by its IAEA safeguards obligations be denied centrifuge enrichment? Similarly, if Iran is going to be permitted to reprocess 15 years from now, how can a country such as South Korea be denied?³

More importantly if the U.S. can no longer credibly oppose the spread of centrifuge enrichment and reprocessing to non-nuclear weapon states, where does this leave U.S. nonproliferation policy? Some supporters of the JCPOA have suggested various types of regional initiatives to attempt to rein in Iran's nuclear program but these do not seem very plausible. Iran's interest in acquiring nuclear weapons is motivated as much by its opposition to the U.S. as it is by any regional adversary. It is hard to see how any regional initiative will get Iran to give up the easy access to the nuclear material required for nuclear weapons granted to it by the JCPOA.

Further, these proposed initiatives would require Israel to give up its nuclear weapons. Given the major concessions to Iran embodied in the JCPOA which give Iran easy access to the fissile material for nuclear weapons, the JCPOA has made Israeli nuclear disarmament far less likely. Further it would be hard to reconcile a policy that demanded Israeli nuclear disarmament when

³ Soo Kim, "Proliferation Fallout from the Iran Deal: The South Korean Case Study," Foundation for Defense of Democracies, October 2015.

the U.S. was not attempting to disarm the far more dangerous Pakistan. Indeed, the U.S. was recently reported to have offered Pakistan access to nuclear technology in exchange for simply reducing certain types of nuclear weapons.

Some of the specifics of these proposed regional initiatives, though said to build on the JCPOA, are actually attempts to fix its defects. One proposal is for a regional ban on reprocessing. But the preliminary JPOA already had banned any Iranian reprocessing and the April 2, 2015 White House fact sheet which outlined the terms of the JCPOA claimed that “Iran has committed indefinitely not to conduct reprocessing.” It was therefore an unpleasant surprise that the terms of the actual JCPOA grant Iran the right to reprocess after 15 years. Such a concession makes it far less likely that any regional reprocessing ban can be enacted.

One proposal to restrict centrifuge enrichment entails limiting the level of enrichment to just 5% to 7%. This proposal reflects a fundamental misunderstanding of the dangers of centrifuge enrichment. Such a restriction would make only a slight difference in the time required to produce the HEU required for a nuclear weapon. As was discussed above, an enrichment plant producing 4% enriched uranium sufficient for just one large nuclear power plant can be used to produce enough HEU for a nuclear weapon in just one week.⁴

A more radical proposal is for members of the P5+1⁵ to purchase a share of Iran’s centrifuge enrichment facilities. It is hoped that such a purchase would allow foreign access and control of Iran’s enrichment facilities. It is quite unlikely that Iran would agree to such a purchase, as it would allow U.S. personnel unlimited access to Iran’s enrichment facilities. Even if Iran did agree, the purchase would provide Iran funds to help improve and eventually expand its enrichment facilities. Further, since the enrichment facilities are located in Iran, the ultimate control over these facilities would always belong to Iran regardless of nominal ownership.

Bottom line, the concessions to Iran in the JCPOA regarding both centrifuge enrichment and reprocessing make it difficult for the U.S. to pursue a coherent nuclear nonproliferation policy. That the first post-JCPOA nonproliferation initiative by the Obama Administration involved suggesting that Pakistan, which has done more than any other country in the past two decades to further the spread of nuclear weapons, be given increased access to nuclear technology does not bode well for the future of nonproliferation.

⁴ Nor am I the only analyst to have produced such calculations. Kemp and Glaser have calculated that a centrifuge enrichment plant with one-half the capacity used in my calculations can produce sufficient HEU for a nuclear weapon in two weeks. See: R. Scott Kemp and Alexander Glaser, “The Gas Centrifuge and the Nonproliferation of Nuclear Weapons,” *Proceedings of the Ninth International Workshop on Separation Phenomena in Liquids and Gases (SPLG)*, September 18-21, 2006, Beijing, China, Tshinghua University Press, 2007, pp. 88-95.

⁵ China, France, Germany, Russia, the UK and the U.S.