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THE IRANIAN NUCLEAR DILEMMA: ENERGY GOALS AND PROLIFERATION CONCERNS

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The Islamic Republic of Iran has long sought to leverage nuclear energy to augment its domestic power generation capabilities. The United States and other allied nations have expressed apprehension regarding the potential diversion of Iran's nuclear programme towards the development of nuclear weapons, which could result in the escalation of nuclear proliferation in the already unstable Middle East region. This article aims to examine the Iranian nuclear programme, taking into consideration the various facets of the issue. The study attempts to delve into Iran's pursuit of nuclear energy and the country's history in this domain. The article discusses the Nuclear Non-Proliferation Treaty concerning Iranian nuclear programme. Finally, the paper aims to address the potential proliferation of nuclear weapons in Iran and provide a nuanced understanding of the complexities surrounding Iran's nuclear programme and its implications for the international community.

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BACKGROUND

In 1945, the United States was the exclusive sovereign state to have successfully developed and conducted testing of nuclear armaments. The harrowing aftermath of the atomic bombing of Japan continues to be a poignant reminder in modern times. In 1946, the Truman Administration enacted the McMahon Act, which barred the dissemination of information related to atomic weapons. This act brought several advantages to the United States, among them, a monopoly on atomic weapons, rendering them unusable by hostile nations, and the capability to deter the Soviet Union through the possession of these weapons. As other countries, such as the Soviet Union, Britain, France, and China became part of the nuclear weapons club, it became imperative for the United States to halt the proliferation of dangerous nuclear technology to other nations.

In 1953, the Atoms for Peace Program was introduced by the United States with the aim of facilitating the establishment of autonomous civilian nuclear programmes among various nations. The objective of this initiative was to promote the peaceful use of nuclear energy and technology, while also addressing the concerns around the proliferation of nuclear weapons. This marked a significant milestone in the international community's efforts to regulate the development and spread of nuclear technology and helped to establish the framework for the peaceful use of nuclear energy. As part of this initiative, Iran received a nuclear reactor of 5 MW from the United States in 1967. This event represented a significant moment in the US-Iran relationship and in the history of nuclear energy development globally.

However, as Iran treaded the path of covert nuclear activities, it elicited concerns among the international community. This article aims to examine the Iranian nuclear programme through a tripartite lens: Iran's pursuit of nuclear energy; second, the ramifications of Iran's nuclear programme on the framework of the Non-Proliferation Treaty (NPT); and third, the concerns regarding proliferation of nuclear weapon technology.

Tracing Historical Roots: Iran's Evolving Nuclear Programme

Iran's pursuit of nuclear energy has an interesting history. During the reign of Reza Shah, Iran was committed to following a path of Westernisation. The relationship between the United States and Iran underwent a significant change following the coup against Prime Minister Mossadegh in 1953. The coup had a lasting impact on the relationship between Iran and the West, and is widely considered a turning point in Iranian history that sowed the seeds for the Islamic Revolution and the current tensions between Iran and the US.

It is widely recognised that Iran's nuclear programme was established with support from the United States through the Atoms for Peace Program, initiated by President Dwight Eisenhower in 1953.[1] This programme aimed to promote the peaceful use of nuclear technology by providing participating countries with resources and training to develop nuclear capabilities for electricity generation, agricultural and medical purposes, and other peaceful applications. The US was involved in transferring nuclear technology and training scientists in the field.

In 1967, the United States initially provided Iran with a 5 MW light water reactor, marking the beginning of Tehran's nuclear programme. In order to further advance its programme, Iran established a research centre and the Atomic Energy Organisation of Iran in 1974. Faced with growing energy demands and limited resources, Iran sought to establish a robust civilian nuclear programme. In 1974, the Shah of Iran declared an ambitious goal of generating 23,000 MW of energy by 1994.[2]

The relationship between the United States and Iran reached its peak when President Nixon extended a "blank check" policy, granting the Shah of Iran the authority to select any military equipment from the US inventory. This decision was met with substantial criticism from within the country and posed considerable difficulties for succeeding Presidents, namely, Ford and Carter. The rising demands

1. Dwight D. Eisenhower, "Atoms For Peace", 1953, at https://www.eisenhowerlibrary.gov/research/online-documents/atoms-peace. Accessed on May 15, 2023.
2. US Department of State, "The Nuclear Vault: The Iranian Nuclear Program, 1974-1978", at https://nsarchive2.gwu.edu/nukevault/ebb268/doc14b.pdf. Accessed on February 7, 2023.

of Reza Shah sparked concerns as they feared that Iran might develop nuclear weapons.

It is important to recognise the significant contributions made by France and Germany in furthering Iran's nuclear programme. Both countries played a crucial role in expanding Iran's nuclear infrastructure and providing training opportunities for Iranian professionals and scientists. These contributions should be given due consideration in any discussions related to Iran's nuclear development. In 1974, Iran entered into an agreement with the French firm, Framatome, to construct two pressurised water reactors (PWRs) with a capacity of 950 MW each at the Kharun site. Despite initial preparations for the construction, the project was ultimately abandoned after the Iranian Revolution in 1979.[3] In 1975, Iran acquired a 10 per cent stake in Eurodif, a multinational joint venture in uranium enrichment with participation from France, Italy, Spain and Belgium. The agreement provided Iran with an estimated 270 tons of enriched uranium (U-235) to a level of 3 per cent.[4] Iran's share in this uranium enrichment plant located in the Tricastin region of France provided Tehran with enough enriched fuel for its nuclear programme.

In July 1976, Iran entered into an agreement with Germany that involved the construction of twin reactors by German company, Kraftwerk Union (KWU) in Bushehr, each housing 1,300 MW(e) Siemens reactors. Both nations pledged that the reactors would be utilised solely for peaceful purposes.[5] In addition to technology transfer cooperation, there was also a comprehensive training programme for Iranian nuclear scientists in Germany. This sparked debates when Germany deliberated on sharing any technology, including the sensitive process of uranium enrichment and spent fuel

3. Bráulio Amado, "France and Iran Sign $4□Billion Accord", *The New York Times*, June 28, 1974, at https://www.nytimes.com/1974/06/28/archives/france-and-iran-sign-4billion-accord-shah-will-receive-5-nuclear.html. Accessed on January 4, 2023.
4. "Business Briefs", *The New York Times*, January 3, 1975, at https://www.nytimes.com/1975/01/03/archives/business-briefs-iran-to-join-france-in-uranium-project-venezuela.html. Accessed on January 4, 2023.
5. "West Germany, Iran Sign Pacts on Atomic Plant", *The New York Times*, July 6, 1976, at https://www.nytimes.com/1976/07/06/archives/west-germany-iran-sign-pacts-on-atomic-plant.html. Accessed on January 7, 2023.

element reprocessing, which has the potential to extract plutonium. However, the trajectory of the Iranian nuclear programme underwent a significant shift with the advent of the Islamic Revolution in 1979. The new regime effectively put a halt to the ongoing nuclear initiatives, altering the direction and progression of the programme.

THE NPT AND THE CHALLENGES

The Nuclear Non-Proliferation Treaty (NPT) signed by 191 countries with the purpose of curbing the spread of nuclear weapons has become a highly relevant and pressing issue in today's world. The NPT serves as a cornerstone of the international community's efforts to promote peace and security, and its implementation and enforcement are critical in achieving this goal. The significance of the NPT cannot be overstated, as it is an essential tool in preventing the proliferation of nuclear weapons and maintaining a stable global security environment.

In 2002, a dissident group revealed Iran's secret nuclear activities, leading to questions about whether Iran, as an original signatory to the NPT, had violated international law by failing to declare its nuclear pursuits to the relevant agency. Two critical factors are crucial for comprehending the scope and character of Iran's enrichment programme: (a) the source of uranium contamination discovered at multiple sites in Iran, and (b) the extent of Iran's attempts to import, produce, and employ P-1 and P-2 design centrifuges. Subsequently, Iran acknowledged in its communications with the International Atomic Energy Agency (IAEA) that it had conducted experiments with materials relevant to uranium conversion at the Tehran and Esfahan Nuclear Research Centres between 1981 and 1993, without reporting them to the IAEA. These experiments involved the production of nearly all the significant materials in laboratory and bench-scale settings. Additionally, Iran admitted its intention to domestically enrich UF6, up to 5 per cent U-235, for Pilot Fuel Enrichment Plant (PFEP) and the Fuel Enrichment Plant (FEP).[6]

6. Board of Governors, IAEA, "Implementation of the NPT Safeguards Agreement", GOV/2004/83, November 15, 2004, at https://www.iaea.org/sites/default/files/gov2004-83.pdf. Accessed on February 1, 2023.

As a confidence-building measure, the Board of Governors adopted a resolution in 2003, stating that Iran must suspend all activities related to enrichment and reprocessing, and to demonstrate full transparency regarding its nuclear activities and cooperate with the IAEA.[7] According to Article IV of the NPT, Tehran holds the belief that it is entitled to the enrichment of uranium and considers it an inherent right. But Article IV of the Treaty also underlines the requirement to demonstrate the peaceful intentions behind nuclear activities. However, IAEA has not been able to certify the peaceful nature of Iran's nuclear programme.

The NPT faces additional difficulties due to nuclear weapons in the possession of Israel, which operates outside the bounds of the NPT and remains the sole country in the Middle East with such armaments. As Arab nations actively advocate for a nuclear weapons-free Middle East, there is a potential for other nations, such as Iran, Saudi Arabia, and the United Arab Emirates, to pursue similar ambitions and acquire their own nuclear weapons.

An additional aspect that underscores the apprehensions surrounding Iran's nuclear program is Article X of the NPT, which asserts that every member state has the authority to withdraw from the Treaty if it determines that exceptional circumstances have jeopardised its paramount national interests. Given the recent reinstatement of sanctions by the United States and the accelerated rate of enrichment by Iran, there exists a likelihood that Iran may opt to disengage from its obligations under the NPT.

THE PROLIFERATION CONCERNS AND THE JCPOA

The Iranian Revolution (1979) marked a significant turning point in the history of modern-day Iran, which not only sparked deterioration of its relations with the West but also resulted in a halt of its nuclear programme. The newly instated regime, under the leadership of Ayatollah Khomeini, altered the modernisation policies established by Reza Shah and evinced reservations about the nuclear programme, deeming it a Western concept at odds with Islamic beliefs. Iran not

7. Board of Governors, IAEA, "Implementation of the NPT Safeguards Agreement", GOV/2003/69, 2003, at https://www.iaea.org/sites/default/files/gov2003-69.pdf. Accessed on February 1, 2023.

only terminated a majority of agreements signed by the Shah with the US and other nations, but also abandoned several civilian initiatives such as the construction of four nuclear power plants. In 1980, Iraq launched an attack on Iran while it was still facing economic challenges due to the transition period.

Tehran's pursuit of a nuclear programme rekindled in the mid-1980s under then President and the present supreme leader, Ayatollah Ali Khamenei. The Iranian regime approached foreign scientists for developing research reactors and mastering uranium enrichment technology. In 1986, a visit by President Khamenei to Pakistan paved the way for greater economic and technical collaboration between the two nations. Subsequently, the respective heads of the Pakistani and Iranian atomic energy commissions formalised an agreement on peaceful nuclear cooperation in the following year. Pursuant to this agreement, 39 Iranian nuclear scientists and technicians were slated to enhance their expertise through training at Pakistani nuclear facilities, reactors, and laboratories. Simultaneously, Iran entered into an accord with the Government of Argentina for training Iranian scientists and supplying 20 per cent enriched uranium. Furthermore, during 1988-1989, it is reported that Iran acquired substantial quantities of yellowcake from South Africa, presumably intended for enrichment in either Iran or Pakistan.[8]

To attain self-sufficiency in centrifuge production, Iran discerned that the acquisition of designs and assembly of components would prove to be more cost-effective than purchasing a complete facility. In 1994, Iran received two containers of used centrifuge units from Pakistan for approximately $3 million.[9] In 2003, Iran notified the IAEA that while the centrifuges in its possession had been domestically manufactured from components sourced from Pakistan, they contained traces of highly enriched uranium (HEU) particles due to the latter's own enrichment activities.

8. M. Kibaroglu, "Good for the Shah, Banned for the Mullahs", *Middle East Journal*, 60(2), 207-32, Spring 2006, at https://www.jstor.org/stable/4330247. Accessed on May 17, 2023.
9. Peter Griffin, Press Release by Inspector-General of Police in Relation to Investigation on the Alleged Production of Components for Libya's UR, 2004, Institute for Science and International Security, February 20, 2004, at https://isis-online.org/uploads/iaea-reports/documents/Malaysian_Police_Report.pdf. Accessed on January 20, 2023.

When the United States created the atomic bomb, it did not anticipate that other nations would readily acquire the same technology and expertise. Currently, while many states have the capability to develop nuclear weapons, some choose not to. However, given the rapidly evolving geopolitical landscape, particularly in light of the Russo-Ukraine conflict, there is a possibility that countries such as South Korea, Saudi Arabia, and the United Arab Emirates may pursue nuclear weapons in response to the threat posed by the neighbouring nations that possess such weapons.

Despite ongoing debates on whether Iran has nuclear weapons, the country had deliberately pursued a nuclear programme until 2003, which goes against its commitments under the NPT. Ever since the US backed out of the historic agreement in 2018, it has resulted in higher proliferation concerns. The Joint Comprehensive Plan of Action (JCPOA) accord was reached in 2015 following extensive negotiations between the world powers (China, France, Russia, the UK, the US and Germany) and Iran. As part of the deal, Iran agreed to limit its nuclear programme, leading to the lifting of certain economic sanctions imposed on the country. However, former US President Donald Trump withdrew from the JCPOA citing the deal's failure to address the Iranian missile programme concerns and absence of robust inspection and verification mechanism.[10]

Following its withdrawal from the nuclear agreement, the United States reinstated sanctions, eliciting negative responses from its European partners. After Biden assumed office in 2021, expectations for renewed joint efforts towards the reinvigoration of the JCPOA emerged. In April of that year, Iran initiated indirect negotiations with the United States aimed at restoring the agreement; however, by August 2022, these discussions had reached a stalemate. Despite the passage of two years under President Biden's leadership, the status quo of the JCPOA remains unchanged and there is no progress in the dialogues between the two parties.

10. National Archives and Records Administration, The White House, "President Trump is Ending United States Participation in an Unacceptable Iran Deal", 2018, at https://trumpwhitehouse.archives.gov/briefings-statements/president-donald-j-trump-ending-united-states-participation-unacceptable-iran-deal/. Accessed on February 7, 2023.

Rafael Grossi, Director General of the IAEA, expressed concern over recent unauthorised changes at Iran's Fardow nuclear facility. The changes, which involved the interconnection between two uranium-enriching machines, were not reported to the IAEA. Recent denials of access to inspectors have made it difficult to assess Iran's nuclear infrastructure.[11] Iran's recent actions, including the cessation of its transparency and verification commitments under the JCPOA, are a cause for concern. The country has failed to implement its Additional Protocol and has not provided credible answers to the IAEA's questions over nuclear particles found at three undisclosed sites.

France, Germany, the United Kingdom, and the United States issued a statement concerning Iran's unauthorised alterations made to the centrifuges located at the Fordow Enrichment Plant. The centrifuges, which produce 60 per cent high-enriched uranium, were altered without prior notification, violating Iran's NPT safeguards agreement. The change undermines the IAEA's ability to monitor Iran's nuclear facilities and highlights the importance of Iran fulfilling all reporting requirements and agreeing to essential safeguards monitoring. The production of near-weapons-grade uranium at Fordow carries significant proliferation risks and lacks credible civilian justification.[12] Grossi suggests that an alternative agreement to the Iran deal could potentially break the current deadlock in the negotiations between Iran and global powers. He also emphasised the importance of having necessary measures to prevent nuclear proliferation and ensure the nuclear programme stays within acceptable limits.[13]

11. Patrick Wintour, "Tensions brew between Tehran and the IAEA over nuclear plant", *The Guardian*, February 7, 2023, at https://www.theguardian.com/world/2023/feb/07/tensions-brew-between-tehran-and-the-iaea-over-nuclear-plant. Accessed on February 7, 2023.
12. US Department of State, "Statement by France, Germany, the United Kingdom, and the United States on the IAEA's Latest Report on Iran's Nuclear Program", 2023, at https://www.state.gov/statement-by-france-germany-the-united-kingdom-and-the-united-states-on-the-iaeas-latest-report-on-irans-nuclear-program/. Accessed on February 7, 2023.
13. L. O'Callaghan, "IAEA chief touts alternative to Iran nuclear deal to break impasse", *The National*, July 2, 2023, at https://www.thenationalnews.com/world/uk-news/2023/02/07/iaea-chief-touts-alternative-to-iran-nuclear-deal-to-break-impasse/. Accessed on May 18, 2023.

CONCLUSION

The Iranian nuclear dilemma presents a complex issue that revolves around Iran's pursuit of civilian nuclear energy and the concerns raised by Western nations regarding covert nuclear weapons development and the potential escalation of proliferation in the Middle East region. Through an analysis, it becomes evident that both sides of the debate have legitimate concerns and interests that need to be addressed in a constructive manner.

The pursuit of nuclear energy in Iran has a long-standing history, with even Reza Shah striving to achieve nuclear capabilities in order to preserve fossil fuel resources for exportation. During this period, the United States provided support to Iran in attaining this objective. However, as the United States became aware of the potential diversion of Iran's nuclear efforts towards weaponisation, their backing for the Shah's nuclear energy goals diminished. To advance his aspirations, the Shah turned to France and Germany, engaging in contractual agreements to meet Iran's nuclear energy needs. Subsequently, concerns regarding proliferation emerged when covert nuclear operations were uncovered in 2002 under the existing Islamic regime.

Iran's enrichment activities beyond the scope necessary for a civilian nuclear programme drive the possibility of nuclear proliferation in the already volatile Middle East region and pose a grave concern for Western powers, particularly the US. The fear is that Iran's acquisition of nuclear weapons would trigger a nuclear arms race in the region, with rival countries feeling compelled to develop their own nuclear capabilities for self-preservation. This could undermine the balance of power and increase the risk of nuclear conflict in the Middle East.

The Iranian nuclear dilemma has significant implications for India as well. The international sanctions imposed on Iran impacted India's trade relations with Iran, including oil imports and other economic activities. These sanctions limit India's ability to engage in trade and investment with Iran, affecting bilateral ties and potentially causing economic losses for Indian businesses. India has traditionally maintained friendly relations with Iran while also strengthening strategic ties with the United States and Israel. Balancing these relationships amidst tensions related to Iran's nuclear programme

poses a diplomatic challenge for India. Instability resulting from the Iranian nuclear dilemma could also have repercussions on India's security and regional interests.

A balanced approach is required to resolve the Iranian nuclear issue that addresses both Iran's energy goals and the concerns of the international community. The establishment of confidence-building measures, such as enhanced transparency and more rigorous inspections, holds the potential to strengthen trust between Iran and the international community. Additionally, diplomatic endeavours should address the fundamental geopolitical tensions and rivalries in the region that contribute to concerns surrounding proliferation.