

SECURING THE MIDDLE EAST: A NEW NUCLEAR BLUEPRINT

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Introduction

The Middle East is one of the most unstable regions in the world, prone to the spread of nuclear weapons. It features long-standing rivalries, fragile states, and countries that either have nuclear weapons or can develop them. In this setting, “nuclear security” means more than just controlling arms. It includes preventing the theft of nuclear materials, protecting civil nuclear facilities from sabotage and accidents, and managing dual-use technologies like uranium enrichment that can be used for civilian and military purposes. The main challenge has two parts. First, there has been a steady decline in institutions and diplomatic efforts that once helped manage the risks of nuclear proliferation. The failure of the Joint Comprehensive Plan of Action (JCPOA) and the inability to create a Middle East Nuclear Weapon-Free Zone (NWFZ) have increased strategic uncertainty. Second, the reactions among regional states are becoming more intense as they seek nuclear latency, which means being ready to make weapons to safeguard against perceived threats. This situation is creating a risky security dilemma that could lead to more nuclear proliferation and conflict.

This policy brief discusses the risks of proliferation and the weaknesses in institutions related to the fast growth of nuclear programs, both military and civilian, during increased regional conflict and the collapse of multiple agreements. It looks into how the changing nuclear situation in the Middle East threatens regional stability. It also suggests practical ways to improve nuclear security and stop weaponization.

The Nuclear Crucible: Proliferation and Instability in the Post-JCPOA Middle East

The collapse of the Joint Comprehensive Plan of Action (JCPOA) in 2018, along with ongoing regional tensions, especially between 2024 and 2025, has deepened the nuclear security crisis in the Middle East. This period marks a clear shift from the fragile stability provided by the original agreement. It has created a risky environment where nuclear readiness, security issues, and infrastructure weaknesses come together to increase the chances of conflict and regional proliferation. The dynamics of this new nuclear crucible involve strategic actions from important regional players, leading to a complicated and perilous situation for international non-proliferation efforts.

Nuclear Latency and the Breakout Challenge

The first and most pressing challenge comes from Iran's advancing nuclear program without strong international limits. Nuclear latency, or the ability to quickly acquire a nuclear weapon without having one, is Iran's main strategic safety net. After the US left the JCPOA, Iran began to systematically

violate the deal's restrictions. It increased its enrichment purity and stockpile. By 2024–2025, Iran's production of uranium enriched to 60% and the growth of advanced centrifuge cascades significantly shortened its "breakout time," which is the estimated time required to produce enough fissile material for one nuclear weapon.

In the past, the JCPOA, signed in 2015, extended Iran's breakout time to about one year by limiting enrichment to 3.67% and capping its stockpile. The goal of 60% enrichment, which is well above what is needed for peaceful civilian use, has a clear political and technical aim. Enrichment is an exponential process; progressing from 60% to weapons-grade 90% is technically much quicker than the initial jump from 3.67% to 20%. In the context of weaponization risk, the planned rebuilding of damaged and underground facilities, including the expansion at Taleghan-2 at Parchin and ongoing activities at Fordow, indicates a push to strengthen infrastructure against possible strikes. This drive for hidden or 'weaponized' latency raises the risk that Iran could quickly and secretly decide to pursue a weapon. Estimates in 2024 indicated that Iran had enough highly enriched uranium, if further refined, for potentially multiple nuclear explosive devices, bringing the world closer to a new nuclear weapons state.

Regional Hedging and the Security Dilemma

Iran's faster program has created a serious security issue in the Middle East. This situation is pushing other regional powers to adopt hedging strategies. These strategies could lead to a chain reaction of nuclear arms development. The Saudi Arabian nuclear program is an example for this situation. Concerned about a potentially nuclear-armed Iran, Riyadh has indicated its willingness to match Iranian capabilities. Crown Prince Mohammed bin Salman has publicly stated that if Iran develops a nuclear weapon, the Kingdom will do the same as soon as it can. One of the main issues in civil nuclear cooperation with Saudi Arabia is its insistence on keeping the right to a domestic nuclear fuel cycle, especially uranium enrichment and reprocessing (E&R). E&R capabilities are crucial because they allow a country to produce its own fissile material for weapons. The US and other allies have pushed for a "Gold Standard" agreement. This would require Riyadh to get enriched uranium from outside sources, avoiding domestic E&R. Saudi Arabia's refusal of this limitation clearly shows its aim to keep open the option of developing a nuclear weapon if its security situation worsens.

The Cascade Proliferation Threat is the most serious regional risk. If one country becomes nuclear, it could lead to a domino effect. Other countries that feel threatened, seeing a breakdown of US security guarantees or international non-proliferation efforts, might feel forced to pursue their own weapons. Historically, countries like Egypt and Turkey have shown interest in nuclear energy and could feel

pressured to respond, turning the region into a multi-state nuclear area and increasing instability throughout the Middle East.

Safety, Security, and Transnational Vulnerabilities

The third focus area looks at the physical security and safety of nuclear facilities. This threat has increased due to military and covert strikes. The line between nuclear safety, which prevents accidents, and security, which stops intentional sabotage or theft, is becoming unclear. This creates a dangerous overlap between safety and security. Historically, this threat is real. The 1980 Iranian attack on Iraq's Osirak reactor and the 1981 Israeli strike on the same facility showed the willingness to use military force against nuclear programs. More recently, the ongoing conflict in Ukraine has exposed the risks of military operations near civil nuclear infrastructure. Russian attacks on Ukraine's energy grid have repeatedly put the external power supply of the Zaporizhzhia Nuclear Power Plant (ZNPP) at risk; this supply is critical for cooling the reactor and spent fuel.

The Contemporary Attacks on Nuclear Infrastructure. Between 2024 and 2025 there were ongoing sabotage and military strikes aimed at Iranian nuclear and military-industrial sites, providing an outlook on the vulnerabilities of the nuclear facilities. Israeli attacks focused on slowing Iran's progress. These incidents, which build on past events like the 2010 Stuxnet cyberattack that targeted Iranian centrifuges, represent a new type of conflict. More direct military strikes, such as those in 2025, raise the risk of a catastrophic release of radioactive material. The main risk of kinetic strikes on facilities like the Bushehr nuclear power plant or enrichment sites such as Natanz is not just stopping the program but also potentially causing an uncontrolled release of radioactive material. Bushehr is an operational power reactor located in a seismically active area. A strike or even a system failure worsened by a security breach could harm containment structures, spent fuel pools, or cooling systems. This could lead to an accident similar to Fukushima or Chernobyl, but on a regional scale.

Damage to a facility like Bushehr could create a radiological plume that affects neighboring countries in the Persian Gulf, regardless of their role in the conflict. This illustrates the core danger of the safety-security overlap. A deliberate act of security, like a military strike, could unintentionally lead to a disastrous safety failure with severe and widespread consequences.

The Imperative for Action

The current situation is marked by dangerously short breakout times related to Iran's program, the increasing risk of cascade proliferation from Saudi Arabia's strategic hedging, and the constant threat of a

radiological incident from attacks on crucial nuclear infrastructure. Ignoring these connected challenges now could trap the region in a state of ongoing vulnerability. Deterrence may become weak, and the fallout from any miscalculation could be disastrous.

We need to shift from just trying to restore an old agreement. Instead, we should focus on creating a lasting framework for regional stability.

Initially the Re-establishment of Credible Constraints on Latency which aims is to significantly increase the time and cost needed for any state in the region to obtain a nuclear weapon. Which consist of two major elements Intrusive verification and Cap and Rollback. Intrusive Verification as any future agreement with Iran must allow IAEA inspectors "anywhere, anytime" access to sites of concern. This access should cover the entire fuel cycle, especially advanced centrifuge research and production. This requirement goes beyond the original JCPOA's scope, addressing capabilities Iran has developed since 2018. While Cap and Rollback emphasizes on the Policy which focuses on reducing highly enriched uranium stockpiles, particularly material enriched to 60%. It should also aim to dismantle advanced centrifuge cascades. The goal is to extend the breakout window to at least one year, giving the international community enough time for diplomatic or security responses.

Secondly the De-escalation of the Security Dilemma via Regional Dialogue. To prevent further proliferation, the concerns of regional hedgers must be tackled through a parallel process that promotes security and builds trust. For instance Regional Security Architecture(RSA). Organize a forum, possibly under the guidance of the P5 or the UN Security Council, involving key regional players like Iran, Saudi Arabia, the UAE, Turkey, Egypt, Israel, and the Gulf Cooperation Council. This group should focus on non-proliferation and conventional arms control. The initial goal should be to negotiate a "Nuclear Non-Aggression Pact" that prevents the first use of conventional force against nuclear facilities. The Persistent Security Assurances Non-nuclear states such as Saudi Arabia must receive credible, internationally supported security guarantees in exchange for voluntarily accepting the IAEA's "Gold Standard" for nuclear cooperation. This standard involves giving up domestic uranium enrichment and reprocessing capabilities.

Finally the fortification of Nuclear Safety and Security Governance. Given the clear history of attacks, we must quickly address institutional weaknesses related to infrastructure vulnerability, like Universal Ratification of Treaties and establishment of technical task forces. Urge all regional states to ratify and fully implement the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities (CPPNM) and its 2005 Amendment. Later create a task force that is internationally supervised and linked

to the IAEA, with regional support. This task force should assess and reduce the vulnerabilities of facilities in high-risk areas, such as those near seismic threats like Bushehr. It would set minimum technical safety and security standards that all nuclear operators in the region must follow, specifically focusing on protecting facilities from military and cyber-attacks.

Conclusion

The mix of political instability, growing nuclear capabilities, and a lack of a clear regional security plan creates a serious policy challenge. This project aims to offer a practical, evidence-based plan to prevent nuclear weaponization and improve overall nuclear security in the Middle East. By tackling the connected issues of deterrence, latency, and weak institutions, this brief sets out a way forward that will help create a more stable and secure regional order while also supporting global non-proliferation goals. The time for scattered diplomacy is over; a complete, regional, and security-focused approach is the only way to protect the Middle East from a nuclear disaster.

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