Weâ??ll Go No More Enriching

Description

The United States and Israel have struck Iranâ??s nuclear infrastructure twice in less than a year and have killed dozens of nuclear weapons scientists in what is the most comprehensive and deadly counterproliferation campaign in history. The International Atomic Energy Agencyâ??s (IAEA) Director General says the program has been â??rolled back considerably.â?• Iranâ??s own foreign minister admitted last November that the country could no longer enrich uranium. The machines and factories are damaged. The mountains are sealed. And yet, more than 400 kilograms of 60 percent enriched urani umâ??enough for ten to twelve weaponsâ??remains buried somewhere beneath Iranian soil, with no international monitors to account for it.

The debate in Washington still focuses on hardware: centrifuges destroyed, tunnels collapsed, enrichment capacity degraded. But Israel understands something others have missed. The most irreplaceable component of a nuclear weapons program is not infrastructure. It is the small circle of scientists who know how to turn enriched uranium into a functional weapon. Israeli intelligence concluded years ago that a number of individuals, possibly fewer than forty, held the integrated knowledge required to weaponize enriched uranium. It then built a targeting program around that assessment. Whether the current campaignâ??s devastation of Iranâ??s weaponization capacity translates into durable nonproliferation depends entirely on what irregular warfare approaches complement the kinetic campaign.

The Nuclear Kill Chain

The targeting of Iranâ??s nuclear scientists began in 2007 when Ardeshir Hosseinpour, a nuclear physicist working at the Isfahan uranium facility, died under mysterious circumstances. Between 2010 and 2012, four more scientists were killed and a fifth was wounded by motorcycle bombs and magnetic devices attributed to Israeli intelligence. These losses disrupted but did not cripple the program. Mohsen Fakhrizadehâ??s assassination on November 27, 2020, was categorically different. Mossad, the Israeli foreign intelligence service, allegedly used a remote-controlled, AI-assisted machine gun smuggled into Iran and operated from thousands of miles away to kill Fakhrizadeh with pinpoint accuracy as he was traveling in a car. Fakhrizadeh ran both the AMAD Plan, a Farsi project codename (not an acronym) for Iranâ??s pre-2003 clandestine nuclear weapons effort, and its successor organization SPND (Organization of Defensive Innovation and Research). He understood how every

component fit together. His death removed the programâ??s central node.

On June 13, 2025, Israel escalated from individual assassinations to industrial-scale elimination. Operation Narnia killed nine senior nuclear scientists simultaneously in their homes in Tehran. Israeli intelligence officials considered the scientists the most important targets because Iran could replace equipment far more easily than those men and the knowledge they possessed. Of the eleven IDF-confirmed targets, six held explosives or multipoint initiation expertise, at least three specialized in nuclear simulation, and four were neutron initiator experts. Subsequent operations brought the toll to approximately twenty. Israel simultaneously destroyed a copy of the Nuclear Archive at SPND headquarters and launched a psychological warfare campaign warning surviving scientists that their continued participation in Iranâ??s nuclear program meant death.

The February 2026 strikes extended the kill chain to Iranâ??s political and military leadership. Supreme Leader Khamenei, the IRGC commander, the armed forces chief of staff, and SPND head Hossein Jabal Amelian all died. The losses cut into the nuclear decision chain itself. Khamenei held final authority over weaponization policy, the IRGC provided physical and operational security for sensitive material and personnel, and Jabal Amelian directed the organization inside which surviving weaponization work was concentrated. Israel struck a compound near Tehran where scientists had reportedly relocated their weaponization work. The war dealt a severe blow to nuclear infrastructure and delayed progress by years, even without eliminating the 60 percent enriched stockpile.

What No Library Holds

Most public analysis focuses on breakout time, meaning how quickly Iran could enrich enough uranium for a weapon. But that metric answers the wrong question. Weaponization steps would take approximately a year independent of enrichment. There was also a more deadly arithmetic at play.

The average age of the dead scientists was sixty. Younger scientists, however talented, cannot simply step into roles their predecessors spent lifetimes growing into. Building a nuclear weapon requires integrated mastery of implosion physics, explosive lens configuration, neutron initiator development, yield simulation, and warhead-to-missile integration. These are not textbook skills. They demand decades of hands-on engineering within a specific programâ??s unique geometry. The dead scientists held this knowledge, and none of it survived them in written form as far as we know. One central finding was stark: in this compartmentalized program, full knowledge of how the parts worked together existed only in the heads of a few. Those heads are gone.

What Survives

The counterarguments deserve serious engagement. The legal and moral objections to scientist targeting are real, and a campaign of this kind sets precedents that adversary states will eventually invoke against American and Israeli scientists in turnâ??but that is an argument about the future cost of the operation, not about what irregular warfare must do once the operation has happened. Iran still possesses a deep scientific base, and killing personnel cannot permanently erase decades of accumulated, institutional knowledge. Over time, it reconstitutes through survivors, migrates across borders with foreign partners, and reassembles in new programs and experiments. While this counterargument carries weight for general physics, it weakens when applied in the near term to the combined knowledge Iran possessed particular to its nuclear program. That specific knowledge lived in perhaps a dozen minds, and its reconstruction will take years.

More concerning is Iranâ??s potential to develop a crude device as an alternative. A gun-type fission weaponâ??essentially a cannon that fires one subcritical mass of uranium into anotherâ??requires dramatically simpler engineering than an implosion device. Iran could dash to produce such a device, deliverable by ship or truck. This pathway is also least affected by personnel losses. Iran likely retains enough material and equipment for several crude bombs.

Here is where the material problem looms. The IAEA lost continuity of information on centrifuge production in 2021. Inspectors have not visited since summer 2025. Pickaxe Mountain, a centrifuge assembly site potentially deeper than Fordow, has not been struck. The same IRGC construction arm that bored Iranâ??s underground missile cities also built the tunnel complexes and hardened bunkers where this material now sits. Whether those cylinders can be recovered by inspection, negotiation, or force remains a question. Two military campaigns have degraded monitoring without eliminating the program, signaling to every government in the region that force alone cannot close the nuclear file.

Counterproliferation: An Irregular Warfare Imperative

Kinetic strikes bought time. They did not buy a solution. What follows must be a sustained irregular warfare campaign designed to make reconstitution permanently unattractive and structurally difficult.

Intelligence services should prioritize detecting and disrupting any transfer of weaponization expertise to Iran from Russia, China, North Korea, or Pakistani networks. Detection alone is a reactive posture. Active interference through sabotage, interdiction, and supply-chain tampering is the work that keeps the window open, and Israel has already demonstrated its competency in these areas for more than a decade. Russia signed a $25 billion reactor agreement with Iran in September 2025. The external assistance pathway demands sustained human intelligence and signals collection that outlasts the kinetic campaign.

The United States should explore inducing defections among Iranâ??s surviving nuclear scientists. The post-Soviet Cooperative Threat Reduction model, which redirected thousands of weapons scientists into civilian employment, offers a proven template. Scientists hiding in safe houses, hunted and aware their predecessors died in their beds, represent a population uniquely susceptible to carefully designed off-ramps. Identifying individuals under duress and offering them a way out is a classic intelligence technique with considerable benefits for an irregular warfare campaign.

Cyber and sabotage operations against reconstitution efforts should continue and expand. Stuxnet demonstrated that covert disruption can impose costs and delays without the political consequences of kinetic strikes. A sustained campaign targeting procurement networks, equipment suppliers, and covert enrichment activity can keep Iran on the defensive without the diminishing returns of repeated military action. The broader gray-zone logic that processing and procurement, not extraction, are the decisive front in modern economic warfare has been developed elsewhere in this journal. Special operations forces retain a role in direct-action options against undeclared enrichment sites and material recovery. Itâ??s a mission the Pentagon has already studied and rehearsed, but the intelligence architecture to identify those targets must come first.

The material accountability gap at Esfahan and Fordow will ultimately require an inspection-based resolution, but the conditions for that resolution must be created through pressure that only an integrated irregular warfare approach can sustain.

Keeping the Window Open

Iranâ??s weaponization capability has taken a blow from which recovery will require years, not months. The old guard is dead. The institutional infrastructure is shattered. The surviving scientists are hiding, hunted, and aware of what happened to those who worked on the same programs.

Previous interventions in Iranâ??s nuclear trajectory were opportunities squandered. The United States and Israel never built an irregular warfare strategy that could sustain the opening. Iranâ??s determination to reconstitute was never met with tools designed to make reconstitution permanently unviable. Operation Epic Fury has created another such window, likely larger than any before. Only a sustained, integrated campaign of intelligence, inducement, sabotage, and coercive diplomacy can keep it open.

The question is not whether Iran can rebuild. Given enough time and sufficient external help, it can. The question is whether American and Israeli policymakers will deploy the right irregular warfare tools required to ensure that â??enough timeâ?• never arrives.

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