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Precision Fire

A Strategic Assessment of Iran's Conventional Missile Program

SEPTEMBER 2016 BILAL Y. SAAB AND MICHAEL ELLEMAN

Preface by Zalmay Khalilzad

Dating back to the war of cities between Iraq and Iran, which terrorized civilians living in Baghdad and Tehran, the acquisition of more robust missile capabilities has been one of Iran's highest priorities. And it has been largely successful. Iran now has the ability to threaten cities and large military facilities across the Middle East with conventional munitions using its missiles as a delivery system. Iran's missile program, its proxies such as Hezbollah in Lebanon and the various Shia militias in Iraq and elsewhere, and its cyber capabilities are giving Tehran important advantages in its struggle with its regional rivals both in the sectarian conflict and in its efforts to achieve regional hegemony.

However, Iran is not satisfied with what it has achieved. It has ambitious plans for expanding the size, range, and accuracy of its missile capabilities. As Iran's forces grow, it will be in a position to threaten not only military targets in the region more effectively, but also countries beyond the Middle East, including those in Europe and eventually even the United States. Iran could use its medium-range missiles to deliver non-conventional warheads, including nuclear weapons, across the Middle East should it decide to do so. Many Iranian officials are expressing their unhappiness with the Joint Comprehensive Plan of Action. Tehran's abandonment of the nuclear agreement before it expires cannot be ruled out.

The Iranian missile program has been a source of significant concern for regional powers, including Israel, as well as Europe and the United States. The prospect for increased Iranian capabilities raises serious questions such as:

What should the United States, its partners, and others do to limit the growth of Iranian missile capabilities?

How will improved Iranian capability impact regional stability, as the range Iran can target with conventional or non-conventional warheads such as nuclear weapons increases?

Established in 2012 as a core practice area of the Brent Scowcroft Center on International Security at the Atlantic Council, the **Middle East Peace and Security Initiative** brings together thought leaders and experts from the policy, business, and civil society communities to design innovative strategies to tackle present and future challenges in the region.

How does Iran's missile program fit into its longer-term strategy for regional hegemony?

What risks do enhanced Iranian missile capabilities pose for US forces in the region and for the United States' commitment to the security of its regional partners?

What steps should regional powers threatened by the Iranian program take to defend themselves and, based on their inadequate response up to now, how likely is it that they would do so in the future?

"Precision Fire: A Strategic Assessment of Iran's Conventional Missile Program," written by Bilal Y. Saab and Michael Elleman, deals with these important questions. It is an excellent primer on Iran's conventional missile program.

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The Islamic Republic of Iran's conventional missile program has always been a source of concern for the United States and its European and Middle Eastern allies and partners. However, such concerns have not compelled Washington to treat this threat with a greater sense of urgency and come up with immediate policy responses.[1] Indeed, had Iran's conventional missiles been a strategic priority for the United States, US officials would have probably used the recent nuclear talks with their Iranian counterparts to try to work out a deal that would also curb Tehran's missile program (whether or not that would have succeeded is a different matter altogether, of course).

Instead, to the chagrin of several Middle Eastern partners, the White House decided not to overwhelm the nuclear negotiations, distinguish unconventional military challenges posed by Iran from conventional ones, and sign a separate nuclear accord. Three main factors help explain why Iran's conventional missile program has not caused US threat perception levels to rise considerably, yet:

First, the United States' forward-deployed presence in the Gulf is an enormously powerful deterrent against potential overt Iranian aggression, and is robust enough to neutralize any conventional threat posed by Iran. That Washington's Arab Gulf partners have considerable military and specifically missile defense capabilities of their own tilts the military balance and augments the deterrent against Iran even further.

Second, Iran's existing arsenal of missiles, though the largest in the Middle East, is technologically inferior and inaccurate. Its primary purpose has been to deter an Israeli attack against Iran, and possibly to intimidate neighbors and influence their defense spending and strategies, not necessarily to attack them. Iranian officials have been explicit about the role ballistic missiles play in their country's defense strategy, as recently specified by Brigadier General Hossein Dehqan, who stated that "Iran's missile capacity is defensive, conventional and deterrent."[2]

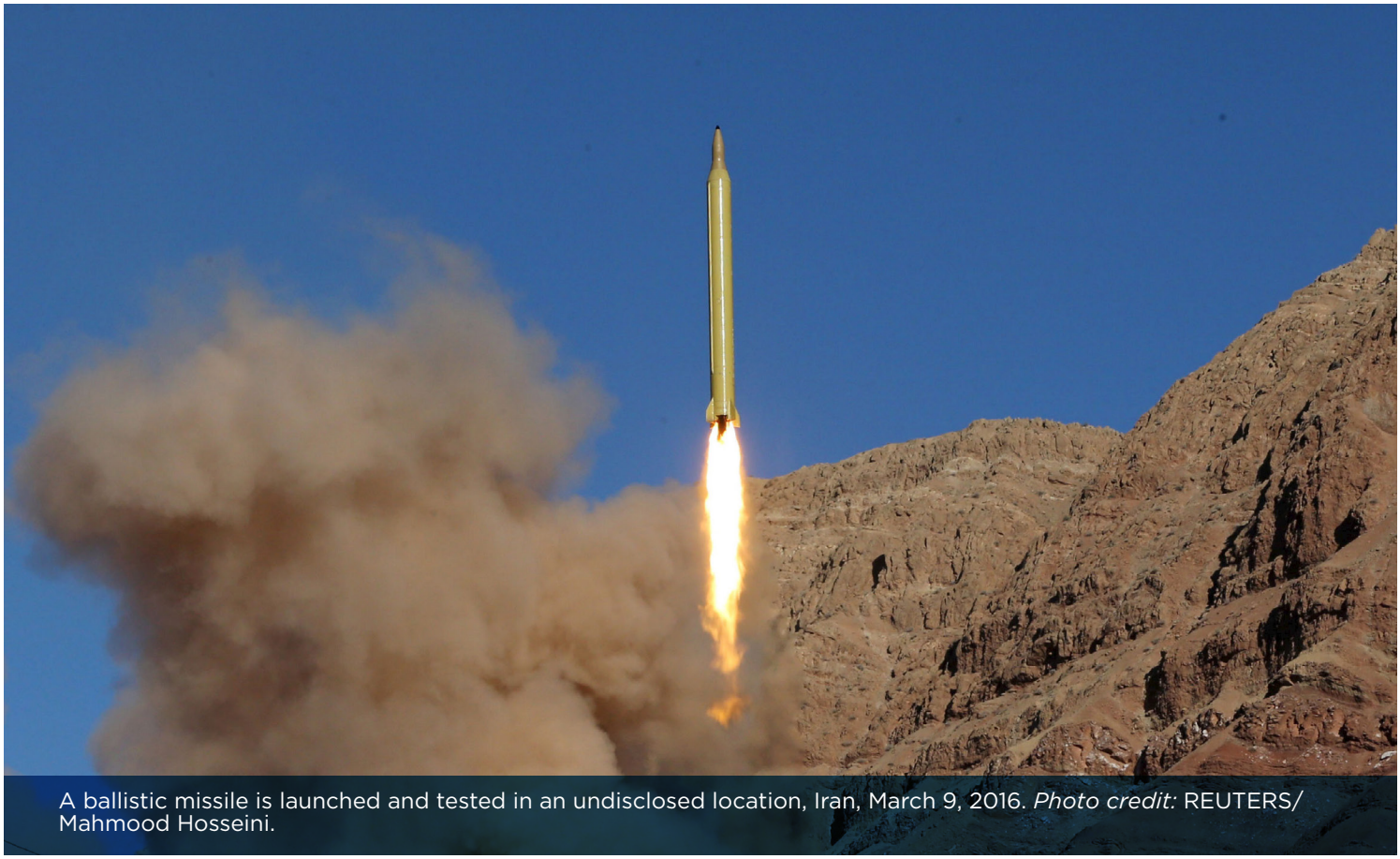
Third, these missiles, despite what some Iranian generals have claimed recently, cannot currently traverse continents and reach the US homeland. On February 9, 2016, Director of National Intelligence James R. Clapper warned the US Congress that Iran has the "means and motivation to develop longer-range missiles, including intercontinental ballistic missiles (ICBMs)."[3] However, whether that would happen in months, years, or a decade remains very much unclear. When asked by Chairman of the Subcommittee of Strategic Forces Mike Rogers in a hearing on March 19, 2015, about current estimates of Iran's ICBM capabilities, Adm. William Gortney, head of US Northern Command, replied: ". . . we assess Iran will not be able to deploy an operational ICBM until later this decade at the earliest."[4]

1 Though it has compelled the United States to push hard for the long-term goal of ballistic missile defense cooperation and integration in the Gulf.

2 Alalam, "Iran warns Israel of military deterrence, missile might," May 25, 2014, http://en.alalam.ir/news/1597338.

3 James R. Clapper, Director of National Intelligence, "Worldwide Threat Assessment of the US Intelligence Community," Statement for the Record, Senate Armed Services Committee, February 9, 2016, p. 8, http://www.armed-services.senate.gov/imo/media/doc/Clapper_02-09-16.pdf.

4 Hearing On "Fiscal Year 2016 National Defense Authorization Budget Request For Missile Defense Programs," March 19, 2015, p. 113, https://www.gpo.gov/fdsys/pkg/CHRG-114hhrg94227/pdf/CHRG-114hhrg94227.pdf.



A ballistic missile is launched and tested in an undisclosed location, Iran, March 9, 2016. *Photo credit:* REUTERS/ Mahmood Hosseini.

These three reassuring factors notwithstanding, the pace with which Iran's conventional missile program has been developing in recent years suggests that the country's missiles could become much more accurate, and thus deadly, within a few years, potentially providing Tehran with a new set of military options and a higher degree of operational flexibility. This would force (and most probably already has forced) the Pentagon to strategize and plan for a range of Iran-related military contingencies in the region like never before. As the utility of Iranian missiles expands beyond deterrence and possibly enters the realm of offense, the likelihood of military crises and kinetic flare ups in the Gulf rises.

Intentions Versus Capabilities

Intentions are as important as capabilities in world politics. Indeed, were Iran ruled by a more moderate and responsible leadership, its conventional missile program would have been less of an issue. Instead, Iran's regional policies since 1979 suggest that Tehran has revisionist tendencies. A large nation with a civilizational role and a proud history, Iran has aspirations that extend beyond its borders, and Tehran often harks back to memories of the Persian Empire to bolster support for these ambitions.

Even though Tehran has learned to live with US regional hegemony, refraining more often than not from crossing red lines, US military power in the Middle East is a source of frustration to the country's mullahs and generals, who often describe Washington's military footprint in the region as unwelcome and unnatural, supposedly designed to subjugate the Iranian nation and prevent it from achieving its full potential.

Although Iran's patience with the United States' regional presence is likely to endure, Tehran will continue to do everything in its power to divide and exploit weaknesses among the United States' Arab Gulf partners and indirectly increase the costs of the United States' operations in the Gulf until Washington leaves or shrinks its presence. Regional hegemony, pursued

pragmatically, gradually, and with the fewest costs, remains Iran's ultimate ambition in the Middle East.

It is through this prism that one should assess any military challenge that Iran's weapons pose to US interests and the regional order, including its improved missile capabilities. These missiles are, and have always been, part of a broader political strategy and military doctrine of Tehran, meant to protect the clerical regime and export the principles of the Islamic Revolution. Although, strictly speaking, they would be classified as conventional weapons, these missiles could equally be used to augment Iran's existing asymmetric capabilities.

Why Missiles?

Tehran's pursuit of missiles and long-range artillery rockets began soon after Iraq's invasion of Iran in 1980. During the war, Iraq repeatedly attacked Iranian cities, petroleum facilities, and other strategic assets with Soviet-supplied aircraft and *Scud*-B missiles. Lacking reliable access to the skilled technicians and spare parts needed to maintain and operate its Western-supplied aircraft, Tehran had limited capacity to respond to the increasing pace of Iraqi assaults on its population centers.

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Iran's post-revolution regime was therefore driven to acquire missiles and rockets from willing suppliers for its counter-strike capabilities. In 1985, in response to yet another barrage of Iraqi missiles, Iran retaliated with *Scud*-B attacks, which shocked the Iraqi regime and large portions of its populace. Then-Iraqi leader Saddam Hussein promptly agreed to suspend missile launches against Iranian cities, if Tehran demonstrated similar restraint. Although the ceasefire did not last, the Iranian regime reasoned that its *Scud*-Bs had fundamentally altered Saddam's strategic calculus, and that ballistic missiles are a powerful deterrent and vital to the defense of the Islamic Republic. This view remains today, with missiles a cornerstone of Iran's deterrence and defense posture.

After the war, missile acquisition remained a regime priority, with Tehran turning primarily to North Korea for its more immediate needs, and to China to support its longer-term requirement of greater self-sufficiency. Iran purchased two to three hundred *Scud*-B and -C missiles, with the latter having the range needed to threaten the Arab Gulf monarchies and US forces stationed in the region. In the mid-to-late 1990s, Tehran began purchasing medium-range *Nodongs* from Pyongyang to fulfill the perceived need to target Israel, Turkey, and western Saudi Arabia. The *Shahab*-3/*Nodong*'s range was increased from about one thousand to sixteen hundred kilometers in the 2000s by modifying the airframe and incorporating other minor improvements, resulting in the *Ghadr*. By roughly 2005, Iran could threaten, intimidate, deter, and retaliate against any of its regional foes.

Iran also operates an ambitious space program, which has to date attempted to loft a series of small satellites into orbit using the two-stage *Safir* rocket. At least eight launches were conducted, with only three or possibly four successes. A second-generation launcher, the *Simorgh*, will likely be used to boost larger satellites into space. The *Safir* and *Simorgh* could, in principle, be modified for use as ballistic missiles, though no country has converted a satellite launcher into a missile.

Iran, however, is not capable of independently producing the liquid-fueled *Scud* and *Nodong* missiles. Instead, it must import liquid-propellant engines to support extraterritorial strikes. Creating an indigenous missile-production capacity has been a long-term aim of the Islamic Republic, which drove Tehran to secure the industrial infrastructure and technical know-how from China for the manufacture of solid-propellant artillery rockets. Iran leveraged the experience accrued producing heavy rockets to develop and manufacture larger solid-propellant rocket motors. In 2008, Iran began flight testing a two-stage, medium-range ballistic missile based on solid-fuel. The *Sajjil*-2 missile remains under development, though its existence animates Iran's resolve to become less reliant on imported technologies for its key strategic capabilities.

Poor Accuracy, for Now

The military utility of Iran's current missile stockpile is severely limited by the poor accuracy of its most

Table 1. Iran's Current Missile Arsenal

Missile	Translation	Fuel	Range (kilometers)	Payload (kilograms)	Note
Zelzal-1	Earthquake	Solid	125	600	Unguided
Zelzal-2	Earthquake	Solid	200	600	Unguided
Fateh-110	Victorious	Solid	200–225	500	Semi-guided
Khalij Fars	Persian Gulf	Solid	200–225	450	Anti-ship Ballistic Missile
Hormuz-1/-2	–	Solid	200–225	450	Anti-radar
Fateh-313	Victorious	Solid	300–325	350?	Guided
Sajjil-2	Baked Clay	Solid	2,000	700	Testing
Shahab-1	Meteor	Liquid	300	1,000	Scud-B
Shahab-2	Meteor	Liquid	500	730	Scud-C
Qiam	Rising	Liquid	700	700	
Shahab-3	Meteor	Liquid	800–1,000	1,000	Nodong
Ghadr	Powerful	Liquid	1,600	700	Deployed
Emad	Pillar	Liquid	<1,600	600	Precision-Guided Munition? Testing
Ya-Ali	Oh Ali!	Land Attack Cruise Missile (LACM)	700?	?	Testing?
Soumar	Soumar	LACM	2,500?	?	Kh-55

Table compiled by Michael Elleman, relying on *Iran's Ballistic Missile Capabilities: A Net Assessment*, International Institute for Strategic Studies, 2010.

advanced systems. For instance, Iran's *Shahab*-1 missiles (*Scud*-Bs) carry one-ton, high-explosive warheads and have an estimated accuracy on the order of eight hundred to one thousand meters circular error probable, or CEP. CEP is defined as the radius of a circle, within which one-half of the warheads are expected to land. For the *Shahab*-1, this translates to a probability of mission success between one-in-one-hundred and one-in-one-thousand for a soft target, such as unprotected humans or exposed aircraft. For hardened targets, the probability drops to as low as one-in-ten-thousand.[5] From the perspective of military planners, to destroy with moderate confidence a single, fixed-point military target, Iran would have to allocate a very significant percentage, if not all, of its missile inventory to just one mission.

Pursuit of Greater Precision

Iranian decision makers seem to understand that deterring attack by threatening to punish potential adversaries and their supporters may not be sufficient. The acquisition of missile defenses by neighboring Gulf states has probably amplified Tehran's worries. Consequently, Iran has spent the past decade refocusing its missile development efforts *away from increasing range to enhancing the precision and lethality of its missiles*.

5 *Iran's Ballistic Missile Capabilities: A Net Assessment*, International Institute for Strategic Studies, 2010.

Fateh-110 missiles on display at the Iranian armed forces parade in 2012. *Photo credit:* Wikipedia.

Iran's pursuit of greater precision is best evidenced by the evolution of the *Zelzal* (*Earthquake*) artillery rocket. The first-generation *Zelzal* is unguided and terribly inaccurate, with half of the rockets missing the intended target by more than three kilometers. Improvements in *Zelzal* accuracy were achieved by spin-stabilizing the rocket, though this measure produced modest results.

About a dozen years ago, Iran began developing the *Fateh*-110, a semi-guided rocket. The designers appear to have incorporated a simple navigation and guidance system, and four aerodynamic control surfaces mounted just below the rocket's warhead section. The navigation unit, which senses deviations in the rocket's pitch and yaw, are likely used to maintain a pre-programmed orientation (i.e., angle of attack) during the boost and ascent phases of flight. If implemented effectively, the flight stabilization system should significantly reduce the *Fateh*-110's lateral dispersion; range dispersion, while improved, is still affected by inconsistencies in the rocket motor's performance. While a significant improvement in accuracy, the first generation of the *Fateh*-110 still lacks the precision needed to reliably strike military targets.

In principle, Iranian engineers could enhance the navigation, guidance, and control system of the *Fateh*-110 so that it continuously corrects deviations along its full trajectory, including final approach to the target. The missile would necessarily have to fly within the atmosphere to maintain positive aerodynamic control over its entire path to the target. Thus, the *Fateh*-110, like other missiles of this type, including Russia's *Tochka* (SS-21) and the United States' *ATACMS* systems, cannot exceed an altitude of roughly thirty-five to forty kilometers if they are to achieve high levels of accuracy, a constraint that limits the achievable range to roughly 200 to 250 kilometers. Only Kuwait, portions of Iraq, and the eastern emirates of the United Arab Emirates (UAE) are within the *Fateh*-110's range. Iran's development of the *Fateh*-313, with a maximum range of about three hundred kilometers, cannot reach most targets in Bahrain, Qatar, Saudi Arabia, and

western UAE, including Dubai and Abu Dhabi, unless launched from islands in the Gulf.

Despite working for a dozen years to improve *Fateh*-110's accuracy, progress has been limited. During the *Great Prophet*-7 war games in 2012, for example, Iranian forces launched more than a dozen rockets and missiles toward a mock airfield. Most of the missiles were *Fateh*-110s, though a few *Shahab*-1 (*Scud*-B) missiles were also fired. Iranian television aired video showing the warheads impacting the intended target. A few months later, *Jane's Defence Weekly* published a report that included satellite imagery of craters distributed throughout a mock airfield and outside its imaginary boundaries.6 The location of some of the craters seen in the satellite imagery corresponds with the impacts shown in the televised video, suggesting that the *Jane's* information accurately reflects events during the war game. Assuming the airfield's center was the aim point for the *Fateh*-110s fired, the spatial distribution of the impacts indicates a CEP of between 800 to 1,100 meters, depending on the calculation method employed, assuming an aim point at another location within the airfield boundaries does not improve the calculated CEP estimate. Not surprisingly, perhaps, the CEP value for the *Fateh*-110 is reasonably consistent with the theoretical predictions based on manufacturing deviations and other contributors to inaccuracy.

The *Fateh*-110's CEP of eight hundred to one thousand meters is on par with that for the *Shahab*-1 missile. Because the lethal effects of a missile warhead weighing between five hundred and one thousand kilograms is limited to about fifty meters, it is easy to understand why the missile is not expected to land close enough to kill or destroy a specific target. As with the *Shahab*-1, the *Fateh*-110 is unlikely to succeed unless the target is very large, like an airfield or military base. Iran will likely need many more years, and scores of flight tests, to reduce the CEP to below two hundred meters. A militarily effective short-range missile will not be available before 2020, and probably much later.

Nonetheless, development of the *Fateh*-110 family of missiles, including the optically guided, anti-ship *Khalij Fars* and the anti-radar *Hormuz* systems, as well as the *Fateh*-313, suggests that Iran seeks to produce and field highly accurate missiles capable of shaping the outcome of future military conflicts. In principle, Iran could improve the accuracy of its larger missiles by incorporating Global Positioning Satellite receivers into the guidance systems of its current arsenal. However, such modifications would improve accuracy by only 20-25 percent, not enough to alter their military utility. Substantial improvements require post-boost phase control systems, or terminal steering to the target. The test launch of the medium-range *Emad* missile in 2015 suggests that Iran holds ambitions to enhance missile accuracy of its medium-range missiles. The *Emad* appears to be a *Ghadr* missile, with a separating warhead capable of steering itself toward a target after it re-enters the atmosphere. It is in its first phase of development. It will require very different technologies relative to the *Fateh*-110 to achieve the design objectives. Based on the time required for other countries to develop an accurate ballistic missile with a range of more than three hundred kilometers, Iran will not possess an arsenal of accurate medium-range missiles before 2025, perhaps longer. Extensive foreign assistance from China or Russia could shorten the timeline, however.

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A Shift in Military Doctrine?

If the pattern to prioritize improved precision over increases in missile range continues, it would mark a discernable shift in Iran's missile doctrine, from one that relies solely on punishing would-be attackers by striking highly valued targets, such as cities, to a strategy that aims also to deny potential foes their military objectives and possibly even launch limited attacks against them.

The doctrinal evolution, if it is real, is consistent with Iran's overarching military strategy, which is primarily defensive, but with precision-guided missiles, could

6 Jeremy Binnie and Andy Dinville, "Satellite imagery shows accuracy of Iran's ballistic missiles," *Jane's Defence Weekly*, October 31, 2012.

entertain offensive tactics. The "mosaic defense" strategy, authored by General Mohammad Ali Jafari, commander of the Iranian Revolutionary Guards Corps, establishes three asymmetric, operational tactics to impede conventional military advances by an attacker. Proxies provide a forward-based fighting force, guerrilla warfare at sea threatens enemies and impedes a navy-supported invasion, and the implicit threat of extraterritorial attacks with ballistic missiles deters adversaries. An arsenal of accurate, highly lethal ballistic missiles supports all three elements of Iran's asymmetric approach to warfare. Heavy-artillery rockets and short-range missiles, if they can deliver ordnance precisely, are capable of substantially raising the costs of enemy access to territory along Iran's borders.

Short- and medium-range ballistic missiles threaten key ports that service the navies of the Arab Gulf states and external powers, including the United States, the United Kingdom, and France, and anti-ship cruise missiles can harass ships deployed within Gulf waters. Ballistic missiles striking air fields with precision could disrupt the sortie generation rate, so vital to US and Arab Gulf fighting strategies. Finally, missiles that reliably avoid potential collateral damage caused by inaccuracies could be used to strike key military and civilian infrastructure with less risk of backlash for the international community. These capabilities assume Iran succeeds in developing highly accurate missiles.

Evidence to date suggests Iran is improving the precision of its missiles, but not enough to generate its desired military outcomes. This will undoubtedly change as Tehran continues to master the necessary techniques needed to achieve greater missile accuracy, as well as the critical enabling technologies, such as real-time targeting and damage assessment capabilities. While Iran is at least five years away from establishing an arsenal of increasingly accurate and lethal missiles, the United States and its Gulf partners must now begin identifying and developing military strategies to mitigate their impact.

Military Contingencies

Existing, US-led deterrence structures in the Gulf against Iran would neither weaken considerably nor become obsolete should Iran acquire precision-guided ballistic missiles. Overwhelming US, British, and French firepower in the region (assuming these countries do not drastically draw down or totally pull out from the region in the future) would still cause Iran to think twice before attacking any of its neighbors.

But with potentially more accurate missiles, Iran could plan *limited* attacks to achieve *strategic* objectives, without inviting massive and swift retribution by Washington. Planning for such potential contingencies and understanding what Iranian objectives they might serve is important to get ahead of Tehran and deny it any strategic opportunities. So how could Iran take advantage of its potentially enhanced missile capabilities while averting direct war with Washington?

Iran might seek to create policy conundrums for Washington by attempting to strike specific targets in the Gulf over which the United States might not retaliate. Consider this: if Tehran ever launched an attack against any US military asset in the region, Washington would strike back forcefully (where and how might depend on what the Iranians hit in the first place). But would a similar outcome ensue if Tehran struck an Arab Gulf city or value target, such as oil installations or water desalinations plants? The Arab Gulf states would certainly hope that the United States would intervene immediately and teach Iran a very painful lesson, but US military involvement might not be so automatic, and would depend on various factors including the risk of escalation, the extent of the initial damage Iran had caused, and the very nature of the circumstances that led Tehran to attack in the first place. When direct US interests are not harmed, it is never easy or straightforward for the United States to decide to use lethal force and possibly go to war against a foreign nation on behalf of partners with whom it does not have a formal alliance or defense pact.

An even more complicated scenario is if Tehran were to fire a couple of precise shots (whenever it does acquire more accurate missiles) against, for example, military radar installations in Riyadh or Abu Dhabi, and as a result, cause serious damage to either country's missile defense system. Would Washington lash out against Tehran then? Perhaps, but again, not necessarily, and compared with the previous scenario one could make the argument that the likelihood of US intervention would be even lower. In this contingency, Washington would definitely pause and think harder about risk-reward calculations, in the interest of, once again, avoiding escalation and preserving regional stability. However, in these second and third scenarios, Washington would face the daunting task of trying to reassure and coordinate with anxious and threatened regional partners who might (and most probably will) decide to retaliate and go on their own if they perceive any American hesitancy or lack of commitment. It is

The United Arab Emirates offload a BMP3 Tank with "Namut" thermal sight, at a Kuwaiti port facility, from its Elbahia L62 landing craft in 2003. *Photo credit:* Wikipedia.

those potential differences in interest, strategy, and tactics between the United States and its regional partners that Tehran would seek to manipulate, and it is those gray zones that it would most likely focus on in potential limited war plans.

Again, the purpose of such surgical strikes for Iran would not be to degrade the military capabilities of its Arab Gulf adversaries, but would be, more importantly, to test the resolve or threshold levels of Washington, the coherence of the Gulf Cooperation Council (GCC), and the unity of the US-Gulf partnership. Another potential goal would be to politically destabilize the intended target and cause enough panic and chaos domestically to allow Iranian proxies already operating in the country to make a serious move by either launching a coup or facilitating a popular insurrection against the government. In other words, in the first few critical moments of the crisis following missile launch, Iran would immediately seek to create new and favorable facts on the ground that would serve its long-term interests, and that Washington would find extremely difficult to reverse.

Missile Defense Integration

This is why missile defense in the Gulf, and particularly the goal of integrating this capability, is so critical. That the Arab Gulf states have considerable missile defense capabilities reduces the likelihood of Iran achieving any of its previously mentioned aims (at least not in the very beginning of the crisis) by increasing the raid size required for an attack to penetrate, which would allow these states to "hold the line" until the United States (possibly) steps in militarily. While Arab Gulf missile defense is not foolproof and extremely unlikely in the foreseeable future to negate the potential advantage of offensive Iranian precision-guided ballistic missiles, it does provide flexibility to Riyadh and Abu Dhabi, for example, in terms of military and diplomatic strategy. It also buys them time, reduces their vulnerability, and puts the burden of escalation in an emerging crisis on Iran.

However, Arab Gulf missile defense integration will remain an illusion without greater trust and closer political relations among the United States' regional partners.[7] Even if Washington overhauls its export control regime, adopts a more strategic approach to foreign military sales, and provides all the software and hardware needed to develop its Gulf partners' capabilities, Arab Gulf politics will continue to obstruct missile defense integration. Effective missile defense in the Gulf requires first and foremost a fully integrated intelligence, surveillance, and reconnaissance system and a shared early-warning system. But GCC nations do not agree on what such a system should look like and they do not share nearly enough information. Imagine this hypothetical scenario: Iran fires a missile at any target in Saudi Arabia and the first Gulf country to intercept it is Qatar. Given the rivalry and recent tensions between the two, would the Qataris "take the shot"? It is not entirely clear.

Missile defense integration requires serious political commitment on the part of the Arab Gulf states to conducting cooperative exercises, including high-level, tabletop, scenario-dependent gaming exercises involving the senior military leadership of each GCC member, and preferably in partnership with the United States. The Arab Gulf states would also benefit from thinking collectively about concepts of operations, tactics, techniques, and procedures.

But such efforts are not happening on a consistent or periodic basis, whether in Washington or in the region (with the notable exception of a senior-level exercise held by Kuwait on May 23-25 of this year), and it is not just because there are organizational and institutional challenges or intellectual and analytical shortcomings among Gulf military leadership and staff. In addition to mistrust, the real issue is that GCC members do not even perceive the Iranian threat in the same way. Nobody expects the Arab Gulf states to unite or agree on all issues. The ship of GCC unity sailed a long time ago. But there is a big difference between disagreement and mistrust, and this is a clear case of the latter.

It will already be extremely difficult for the Arab Gulf states' missile defense systems to keep up with the increasing accuracy of Iran's missiles. Cementing Iran's advantage in the future even further is the absence of an integrated missile defense structure in the Gulf, perhaps calling into question the strategic premise of Arab Gulf missile defense altogether, given its exorbitant financial costs and uncertain overall contribution to national security.

Conclusion

Conventional wisdom suggests that in the presence of a major US, British, and French military deterrent in the Gulf, there is little reason to worry about any conventional weapon Iran might acquire. Iran is neither careless nor irrational, and therefore is less likely to pick a fight with a much more powerful set of adversaries. However, the profound socio-political changes that are sweeping across the Gulf and the broader Middle East have introduced a degree of unpredictability that could challenge future regional security. This could be enabled by a reduced US desire to get involved militarily in the Middle East, the growing political and military involvement of major powers such as Russia and China, and far-reaching political and generational changes in the Arab Gulf countries that are likely to impact future security and defense policies.

In a post-nuclear-deal era, Iran might be emboldened to test Washington's informal security commitments to its Gulf partners as it has never done before. Although it will most probably continue to avoid clashing militarily with the United States and its regional partners, it might exploit its potentially superior missile capabilities to experiment with contingencies that would create tough policy dilemmas for Washington.

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7 Bilal Y. Saab, "Why the Persian Gulf Isn't Ready for Joint Security," *Defense One,* June 19, 2014, http://www.defenseone.com/ideas/2014/06/why-persian-gulf-isnt-ready-joint-security/86800/?oref=d-river.

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