



Testing the Limits: Iran’s Ballistic Missile Program, Sanctions, and the IRGC

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Iran has the largest missile force in the Middle East, consisting of thousands of short- and medium-range ballistic missiles, and possibly land-attack cruise missiles.¹ Although its missiles are conventionally armed, many could deliver a nuclear weapon if Iran were to ever acquire such a capability. While the nuclear accord with Iran—the Joint Comprehensive Plan of Action (JCPOA), which was given international legal force by UN Security Council Resolution 2231—will likely defer such an eventuality, it did not impose new constraints on Iran’s missile program. On the contrary, UNSCR 2231 loosened them—and included provisions for their lifting in eight years, if not sooner.²

At current production rates, Iran’s missile force could more than double in size by the time the major limits imposed by the nuclear deal are lifted at the fifteen year mark—in 2030. By then, Iran’s growing missile and cyber capabilities could pose major challenges to regional missile defenses, military and critical infrastructure targets, and civilian population centers. This could make preventive action by Israel or the United States, in the event of an attempted Iranian nuclear breakout, much more costly.

Finally, an Iranian nuclear missile force would be highly destabilizing. Short missile flight times between Iran and Israel, the lack of reliable crisis communication channels, and the impossibility of knowing whether incoming Iranian missiles are conventional or nuclear could someday spur Israel—and any additional regional nuclear states that might emerge in the interim—to adopt a launch-on-warning posture, undermining the prospects for a stable nuclear deterrent balance in the region.

DETERRENCE, WARFIGHTING, PROPAGANDA

The Iran-Iraq War (1980–88) convinced Tehran that a strong, capable missile force is critical to the country’s security.³ Missiles played an important role throughout that war, especially during the February–April 1988 “War of the Cities,” when Iraq was able to hit Tehran with extended-range missiles for the first time. Iranian morale was devastated: more than a quarter of Tehran’s population fled the city, contributing to the leadership’s decision to end the war.⁴

Since then, missiles have been central to Iran’s “way of war,” which emphasizes the need to avoid or deter conventional conflict while advancing an anti-status quo agenda via shaping activities—particularly propaganda, psychological warfare, and proxy operations. Iran’s deter-

rent/warfighting triad rests on its ability to: (1) threaten navigation through the Strait of Hormuz, (2) conduct unilateral and proxy direct action and terrorist attacks on multiple continents, and (3) launch long-range strikes using its own missiles, or by way of long-range rockets and short-range missiles in the hands of proxies such as Hezbollah.⁵ Iran's growing cyber capabilities may eventually become a fourth leg of this deterrent/warfighting triad, enabling it to strike at adversaries and to project power globally, instantaneously, and on a sustained basis, in ways it cannot in the physical domain.⁶

Each leg of the triad has distinct advantages and drawbacks. Efforts to close the strait could roil global financial markets but would be a last resort for Iran because nearly all of its imports and oil exports pass through this route. And even a temporary disruption of traffic through the strait would alienate countries in Europe and Asia that depend on Gulf oil. Moreover, Tehran's ability to wage terrorism has atrophied in recent years—as demonstrated by the ill-conceived plan to assassinate the Saudi ambassador to the United States (2011) and a series of bungled attacks on Israeli targets in Asia (2012). Iran cannot be sure that planned terrorist operations will succeed.⁷

Iran can mass missile fires against population centers to undermine enemy morale, though only a small number of its missiles currently have the accuracy to precisely strike military targets or critical infrastructure; these are largely short-range systems such as the Fateh-110 and its derivatives, and perhaps the longer-range Emad. Longer-range systems such as the Qiam, Shahab-3, and Ghadr (see Table 1) could disrupt enemy operations at much greater ranges, though they lack the accuracy to inflict significant damage on military or civilian installations. With increased accuracy, Iran could effectively target military facilities and critical infrastructure, and greatly stress enemy missile defenses—as nearly every incoming missile would pose a threat and would need to be intercepted.⁸ Increased accuracy may be important even if Iran eventually acquires nuclear weapons, given that first- and second-generation devices might provide relatively small yields.

Although terrorist attacks afford Iran a degree of standoff and deniability, follow-on attacks might take weeks or months to plan, and could be difficult to implement against an alerted enemy. By contrast, missiles permit quick, flexible responses during rapidly moving crises. Missile salvos can also generate greater cumulative effects on enemy morale and staying power in a shorter period than can terrorist attacks. For these reasons, Iran's missile force constitutes the backbone of its strategic deterrent.

Iranian officials have often discussed their missile force using terms borrowed from classic deterrence theory. Thus, shortly after the first test launch of the Shahab-3 missile in July 1998, then defense minister Ali Shamkhani explained that to bolster Iran's deterrent capability,

we have prepared ourselves to absorb the first strike so that it inflicts the least damage on us. We have, however, prepared a second strike which can decisively avenge the first one while preventing a third strike against us.⁹

Iran has likewise threatened to respond to an American or Israeli attack on Iran with a “crushing response,”¹⁰ the destruction of the Israeli cities of Tel Aviv and Haifa,¹¹ and strikes against U.S. bases throughout the region.¹² Missiles would likely play a central role in any major military contingency that Iran is involved in, at least until its still-nascent offensive cyber capabilities mature, at which point cyber may augment missiles as the mainstay of Iran's strategic forces.¹³

Missiles are also ideally suited to Iran's “resistance doctrine,” which posits that victory comes through the demoralization of one's enemies by terrorizing their civilians, bleeding their armies, and denying them success on the battlefield.¹⁴ In this regard, the way in which proxies such as Hezbollah and partners such as Hamas used rockets in recent wars with Israel provides a useful template for understanding the role of conventionally armed missiles in Iran's warfighting doc-

trine.¹⁵ Moreover, as terror weapons, rockets and missiles are equally effective, given that civilians are indifferent to whether they are killed by unguided or guided systems.

Missiles are also Iran's most potent propaganda weapon. They are a central fixture of just about every regime military parade, where they are often dressed with banners calling for "death to America" and for Israel to be "wiped off the map."¹⁶ They are used as symbols of Iran's growing military power and reach, and as symbolic surrogates for the nuclear arsenal it has ostensibly foresworn. (Many observers will subliminally link missiles and nuclear weapons, since missiles are the delivery system of choice of every nuclear weapons state.) For Iran, missiles are a key psychological warfare prop, and play a central role in its emerging doctrine of nuclear ambiguity and possible long-term efforts to create a recessed or "virtual" nuclear deterrent.¹⁷

Finally, while most nuclear weapons states created missile forces years after testing their first nuclear weapon and joining the "nuclear club" (due to the significant R&D challenges involved in building missiles), Iran will have a sophisticated missile force and infrastructure in place if it eventually abandons its nuclear nonproliferation commitments. Thus, an Iranian nuclear breakout would produce a more rapid and dramatic transformation in its military capabilities than that typically experienced by new nuclear weapons states, potentially exacerbating the conflict-prone tendencies observed in many new proliferators.¹⁸

IRAN'S MISSILE INVENTORY

As previously noted, Iran has a large, diverse, highly capable missile force consisting of very accurate short-range solid fuel missiles, less accurate but longer-range liquid-fuel Shahab-type missiles, and land-attack cruise missiles. Its short-range ballistic missiles (SRBMs) are for use against near enemies in the Gulf and include the Fateh-110 (with a claimed range of 300 km), Shahab-1 (300 km), Shahab-2 (500 km), Fateh-313 (500 km), Zulfiqar (700 km), and Qiam (800 km). Its medium-range ballistic missiles (MRBMs) are for use against Israel and include the Shahab-3 (1,000 km), Ghadr (1,600 km), and Emad (1,700 km).¹⁹ (See Table 1 and Figure 1) These are believed to be conventionally armed with unitary high-explosive or submunition (cluster) warheads.²⁰ The aforementioned MRBMs have sufficient excess range to be launched against Israel and the Gulf states from the heart of Iran, where they would be less vulnerable to preemption, and some may have the ability to fly depressed or lofted trajectories, thereby complicating the task of missile defenses.

Iran has also tested a two-stage solid fuel missile, the Sejjil-2, whose range of over 2,000 km would allow it to target southeastern Europe—though it is apparently still not operational.²¹ In June 2011, IRGC Aerospace Force commander Brig. Gen. Amir Ali Hajizadeh announced that Iran was capping the range of its missiles at 2,000 km (sufficient to reach Israel but not Western Europe). He stated that "there is no threat from any country to us other than the U.S. and the Zionist regime" and that "the range of our missiles has been designed on the basis of the distance to the Zionist regime and the U.S. bases in the Persian Gulf region." He added that while Iran "possesses the technology...we have no intention to produce such missiles," implicitly eschewing the development of intercontinental ballistic missiles (ICBMs) in a presumed bid to deflect U.S. and European concerns.²² However, Iranian defense minister Brig. Gen. Hossein Dehqan stated in August 2016 that "we don't have any limit for the range of liquid- or solid-fuel ballistic missiles," apparently indicating the lifting of the previous self-imposed limit.²³ Accordingly, Iran is reported to have recently tested, unsuccessfully, a version of the North Korean BM-25 Musudan intermediate-range ballistic missile (IRBM), which may have a maximum effective range of 2,500 km.²⁴

Table 1: SELECT IRANIAN ROCKETS AND MISSILES

This table demonstrates the degree to which Iran’s rocket and missile programs reflect a cautious, incremental approach to military innovation and R&D; the result is an operational rocket and missile force built around a small number of base systems and derivatives.

ROCKET/MISSILE	REPORTED RANGE (KM)	FUEL/PROPULSION	COMMENTS
Fajr-3/-5	45/75	Solid	Mid-range rocket—transferred to Hezbollah
Zelzal-1/-2/-3	125/210/300	Solid	Long-range rocket—transferred to Hezbollah
Fateh-110	300	Solid	Missile derived from Zelzal series rockets—Syria’s M-600 (a derivative) transferred to Hezbollah
Khalij-e Fars	300	Solid	Electro-optically guided antiship ballistic missile—derived from Fateh-110
Hormuz-1/-2	300	Solid	Antiradiation/antiship missiles—derived from Fateh-110
Shahab-1	300	Liquid	Derived from Russian Scud-B missile via North Korea
Shahab-2	500	Liquid	Derived from Russian Scud-C missile via North Korea
Fateh-313	500	Solid	Extended-range Fateh-110
Zulfiqar	700	Solid	Extended-range Fateh-313
Qiam	800	Liquid	Finless design derived from Shahab-2 missile
Shahab-3	1,000	Liquid	Derived from North Korean Nodong missile
Ghadr	1,600	Liquid	Derived from Shahab-3 missile
Emad	1,700	Liquid	Derived from Ghadr missile, reportedly has a maneuvering RV
Sejjil-2	2,000+	Solid	Multistage missile, test flown but not operational
BM-25	4,000	Liquid	North Korean design based on Russian R-27 submarine-launched ballistic missile, test flown?
Ya Ali	700	Turbojet	Air-launched land-attack cruise missile, operational status unknown
Soumar	2,500–3,000	Turbofan	Ground-launched land-attack cruise missile based on Russian Kh-55?

Sources: Michael Elleman, *Iran’s Ballistic Missile Capabilities: A Net Assessment*, IISS Strategic Dossier (London: International Institute for Strategic Studies, 2010); Michael Elleman, “Are Iran’s Missiles a Threat?” *The Iran Primer* (United States Institute of Peace, April 25, 2016), <http://iranprimer.usip.org/blog/2016/may/23/part-i-are-iran%E2%80%99s-missiles-threat>; Uzi Rubin, *The Global Reach of Iran’s Ballistic Missiles*, Memorandum 86 (Tel Aviv: Institute for National Security Studies, 2006), [http://www.inss.org.il/uploadimages/Import/\(FILE\)1188302022.pdf](http://www.inss.org.il/uploadimages/Import/(FILE)1188302022.pdf); Uzi Rubin, “Rockets and Missiles in the Middle East: Global Implications,” PowerPoint presentations, March 2014 and April 2016, <http://documents.mx/news-politics/uzi-rubin-global-threat-evolution-an-update.html>, and https://rusi.org/sites/default/files/uzi_rubin.pdf; Tal Inbar, “The Ballistic Axis: DPRK and Iran’s Cooperation in Missiles and Space—Strategic Implications,” PowerPoint presentation, April 21, 2016, <http://www.slideshare.net/TWIPubs/the-ballistic-axis-strategic-implications-of-dprk-and-irans-cooperation-in-missiles-and-space>.

[TWIPubs/the-ballistic-axis-strategic-implications-of-dprk-and-irans-cooperation-in-missiles-and-space](http://www.slideshare.net/TWIPubs/the-ballistic-axis-strategic-implications-of-dprk-and-irans-cooperation-in-missiles-and-space).

Iran’s Safir space launch vehicle (SLV), which has put four satellites into orbit since 2009, could provide the experience and know-how needed to build an ICBM. Some assessments suggest that the Safir struggled to put a very small satellite into low-earth orbit and has therefore probably reached the outer limits of its performance envelope—and could not serve as an ICBM.²⁵ In 2010, Iran displayed a full-size mockup of a larger two-stage SLV, the Simorgh, which it first tested in April 2016.²⁶ It would seem that Iran is keeping its options open for developing an ICBM.²⁷ Indeed, U.S. intelligence reports indicate that Iran and North Korea are collaborating on the development of a large rocket motor suitable for use in an SLV or ICBM—which may have been the engine tested by North Korea in September 2016 and again in March 2017.²⁸

Tehran has also claimed an antiship ballistic missile capability for potential use against U.S. carrier strike groups: the Khalij-e Fars electro-optically guided missile, and its derivatives, the Hormuz-1 antiradiation missile and Hormuz-2 active radar homing missile, each with a claimed range

of 300 km. It is not clear that these systems are yet sufficiently accurate or effective to pose a serious threat to U.S. naval surface elements in the Gulf.²⁹

As for land-attack cruise missiles, Iran claims to have produced two: the 700-km range air-launched Ya Ali, and the 2,500–3,000 km range ground launched Soumar—which appears to be based on the Russian Raduga Kh-55 missiles obtained some years ago from Ukraine.³⁰ The Kh-55 was the Soviet air force’s primary nuclear-delivery system. It is not clear that either system is operational.

Iran also fields a very large number of rocket systems used by allies, such as Hezbollah, for strategic bombardment. These include the Fajr-3 and 5 (with claimed ranges of 45 and 75 km) and the Zelzal-3 (300 km). During the Iran-Iraq War, rockets played a major role in bombarding Iraqi cities along the border, and they are central to the “way of war” of Hezbollah and Hamas.

Hezbollah is believed to have received relatively small numbers of M-600, SS-21, and Scud-type SRBMs from Syrian stocks, and up to 150,000 short-range rockets from Syria and Iran. In a future war with Israel, Hezbollah could use its highly accurate M-600 missiles (Syrian versions of the Iranian Fateh-110) to hit strategic targets—e.g., military headquarters in Tel Aviv, power stations, Israel’s offshore natural gas production facilities, Ben Gurion International Airport, and its nuclear reactor at Dimona—and could attempt to suppress Israeli missile defenses with massive rocket and missile salvos from Lebanon to facilitate the penetration of its own SRBMs, or MRBMs launched by Iran.

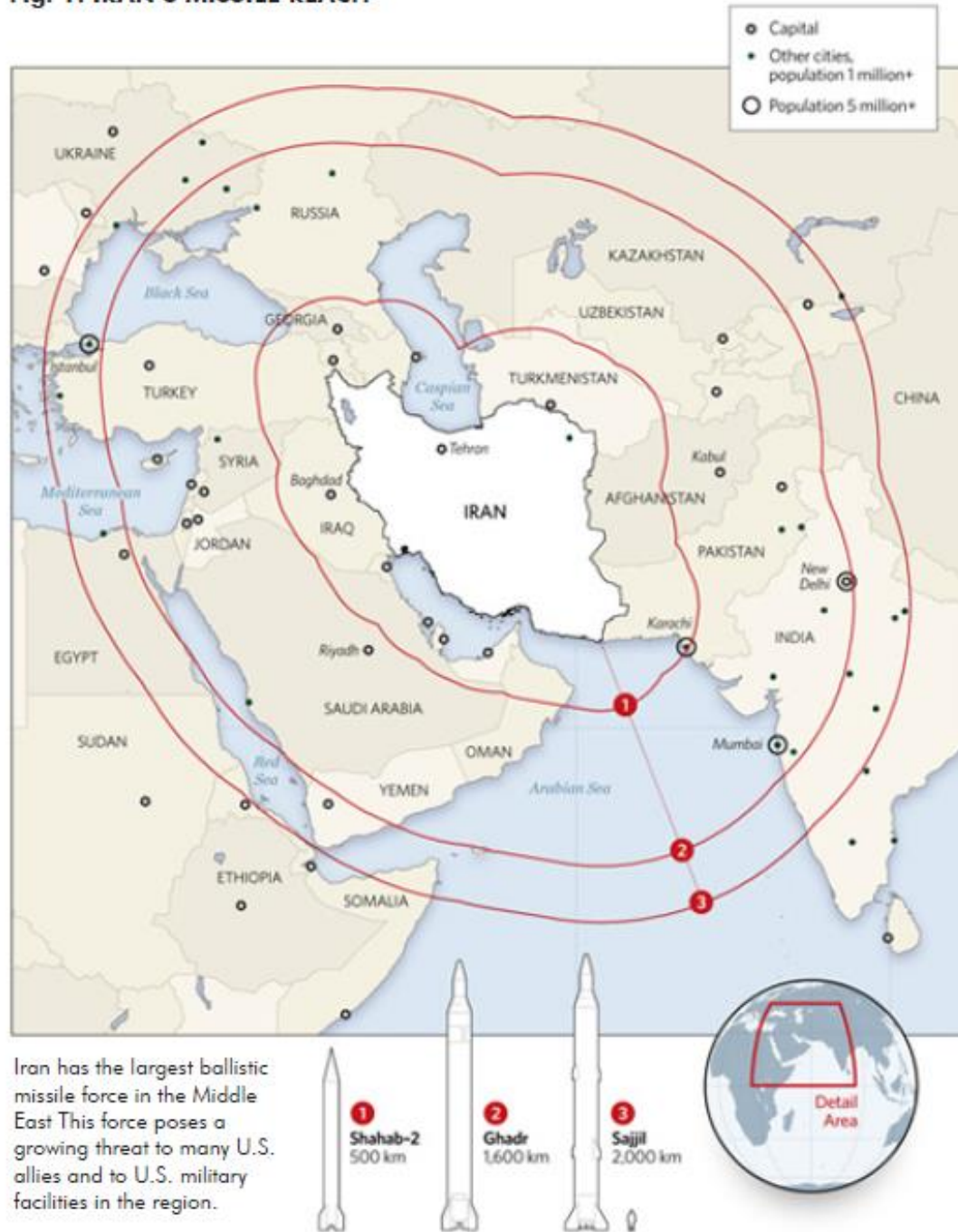
While many of Iran’s missiles are mounted on mobile launchers (some of which are configured to look like civilian vehicles), others are deployed in large numbers of austere “onetime-use” silos³¹ and massive underground launch complexes.³² These launch complexes consist of tunnel systems that service underground missile halls built under mountains as well as pre-surveyed launch sites adjacent to these mountains. Most of Iran’s silo fields and launch complexes are located in the country’s northwest, toward the frontier with Iraq, and in the vicinity of the Persian Gulf.³³ The use of mobile launchers and underground facilities would greatly complicate preventive or preemptive targeting of its missile force. It would enable Iran to undertake prolonged pre-launch preparations for liquid-fuel missiles and to conduct mass fires from protected positions without fear of interdiction or disruption by the enemy. The use of underground facilities could also shield preparations for a surprise strike.³⁴

Iran will likely continue producing SRBMs and MRBMs and may introduce IRBMs in the coming years. UNSCR Resolution 2231, which “called upon [Iran] not to undertake any activity related to ballistic missiles designed to be capable of delivering nuclear weapon,” has not proved a hindrance in this regard, and at any rate, Iran has pledged to ignore it.³⁵ Assuming Iran continues its current production rate of fifty-plus MRBMs a year,³⁶ in fifteen to twenty years, when most of the restrictions imposed by the nuclear accord are lifted, it will have more than doubled its missile inventory. This will further stress regional missile defenses and dramatically increase the potential weight of Iranian missile strikes in a future conflict.

The United States and its Israeli and Gulf Arab allies have been investing significant resources in missile defense in recent decades—while Israel has been investing in rocket defenses as well. America and its Gulf partners, however, still face major challenges: insufficient numbers of interceptors to deal with Iranian saturation tactics, gaps in the coverage of currently deployed missile defenses, and the lack of an integrated missile defense architecture in the Gulf.³⁷ The continued growth in size and accuracy of Iran’s missile force ensures its ability to saturate and overwhelm missile defenses in the Gulf and Israel. Moreover, the improving accuracy of its missile force, in tandem with its growing offensive cyber capabilities, will enable it to target enemy critical infrastructure and missile defenses with a powerful one-two punch in the physical and virtual do-

mains. This will likely render an American or Israeli preventive strike much more costly, and hence less likely, should Iran attempt a nuclear breakout.

Fig. 1: IRAN'S MISSILE REACH



Source: International Institute for Strategic Studies, *The Military Balance 2014* (London: Routledge, 2014). heritage.org

NUCLEAR LINKAGES—POLICY IMPLICATIONS

The International Atomic Energy Agency's "final assessment" of outstanding issues regarding Iran's nuclear program, published in December 2015, confirmed the existence of a number of activities dating to 2002–3 "related to the development of a nuclear payload for a missile," including the integration of a spherical payload (presumably a nuclear implosion device) into a

Shahab-3 reentry vehicle (RV) and a fusing, arming, and firing system for the spherical payload to ensure it remained safe until the RV reached its designated target.³⁸

Moreover, in 2004, Iran began deploying triconic, or “baby bottle,” RVs—a design almost exclusively associated with nuclear-armed missiles—on its Shahab variants (e.g., the Qiam and Ghadr). Some analysts believe that Iran may have deployed the triconic RV to enhance the accuracy of its conventional warheads and achieve higher terminal velocities to defeat missile defenses.³⁹ But Iran’s experience in designing, testing, and operating triconic RVs could also expedite deployment of a miniaturized nuclear device. The discovery that members of the A. Q. Khan nuclear smuggling network possessed plans for smaller, more advanced nuclear weapon designs that might have found their way to Iran, have strengthened these concerns.⁴⁰

As mentioned previously, the ability to place a first generation nuclear device atop a missile—an achievement that took a decade for most nuclear weapons states—could magnify the destabilizing impact of an Iranian nuclear breakout. Moreover, short flight times and the absence of crisis hot-lines might cause Israel—and any other regional nuclear states that emerge in the interim—to eventually respond to an Iranian nuclear breakout by adopting nuclear force postures that include launch-on-warning or pre-delegation of missile launch authority to military commanders. Such measures could increase the risks of accidental or unauthorized use of nuclear weapons.⁴¹ These potential outcomes may increase the incentive for prevention or proliferation by regional states able to do so.

Iran’s creation of a hybrid missile force capable of delivering conventional or nuclear warheads would add another destabilizing element to the mix. In a crisis or war, for instance, Israel might not be able to discern whether incoming Iranian missiles are conventional or nuclear, confronting it with the dilemma of absorbing what might be a devastating nuclear first strike—as some missiles will almost certainly get through its defenses—or launching a nuclear counterstrike in response to what might be a conventional attack.⁴² In such circumstances, Israel’s nuclear forces might be kept on hair-trigger alert. Reckless Iranian rhetoric, moreover, including ritual calls for Israel’s destruction, might incline Israeli decisionmakers to interpret Iranian actions in the darkest possible light.⁴³

Israel’s missile defenses reduce the risk posed by this scenario by ensuring the survival of the country’s nuclear second-strike capability⁴⁴ (consisting of strike aircraft, and land- and sea-based missiles) and its ability to unleash a devastating counterstrike against Iran.⁴⁵ But should Iran continue to build large numbers of increasingly accurate missiles and start employing penetration aids and countermeasures (simple decoys, a modest terminal-phase maneuver capability, chaff, or low-power electronic countermeasures), the efficacy of Israel’s missile defenses could come into question, with negative implications for its margin of security and the potential for miscalculation during a crisis.⁴⁶ Risk, however, cuts both ways, and Tehran has to consider the potential for such a catastrophic miscalculation, which could jeopardize Iran’s very survival. This should be a major theme of Washington’s quiet and public diplomacy to shape the Islamic Republic’s future nuclear choices.

Finally, while there is no evidence that Iran’s leaders adhere to a “messianic, apocalyptic” ideology or that they view mutual assured destruction as “an inducement” and “not a constraint,” in the words of Middle East historian Bernard Lewis,⁴⁷ neither should much credence be given to facile claims that because deterrence worked during the Cold War, it would also work with Iran.⁴⁸ Such claims are based on a superficial and selective reading of the Islamic Republic’s strategic conduct.⁴⁹ For while Iran’s leadership has shown that it is “rational” and generally risk averse, it is also occasionally prone to reckless behavior and to overreach—tendencies that its grandiose ambitions tend to amplify. (Examples of such behavior include the Beirut Marine barracks bomb-

ing in 1983, the Khobar Towers bombing in 1996, and the plot to assassinate the Saudi ambassador to the United States in 2011.)⁵⁰

Indeed, Tehran’s resistance doctrine raises the possibility that under certain circumstances, Iranian decisionmakers might follow a path that could inadvertently lead to a conflict with Israel or the United States, or that they might welcome a limited conflict to achieve certain policy objectives.⁵¹ Indeed, the resistance doctrine has already propelled Hezbollah and Hamas into four destructive wars with Israel (one involving Hezbollah, three involving Hamas). And Iran has responded to its perceived “victory” in its nuclear negotiations by testing to see what kinds of activities it can get away with without jeopardizing sanctions relief and foreign investment. Thus, it has continued with the covert procurement of technology for its missile programs,⁵² engaged in aggressive behavior in the Persian Gulf,⁵³ increased the pace of missile tests and exercises in defiance of UNSCR 2231 (holding one missile launch “event” in the 20 months prior to the announcement of the interim Joint Plan of Action in November 2013, one missile launch event in the 20 months during which the JCPOA was negotiated, and eight missile launch events in the 20 months since the conclusion of the JCPOA in July 2015),⁵⁴ and transferred arms to proxies and allies in Syria, Iraq, and Yemen,⁵⁵ in violation of the spirit, if not the letter, of the nuclear accord and UN Security Council Resolution 2231.

Table 2: Iranian Missile Launch Events by Year

1998	2	
1999	0	
2000	2	
2001	0	
2002	2	
2003	1	
2004	2	
2005	0	
2006	4	
2007	1	
2008	3	
2009	4	
2010	1	
2011	3	
2012	1	
2013	0	
2014	1	
2015	2	
2016	5	
2017	1	(includes only the first three months of the year)

Methodology: This table tallies the number of days in which *publicized* MRBM tests or launches occurred, and may include individual or multiple launches on the same day. MRBMs include the Shahab-3 and its variants (Qiam, Ghadr, and Emad) and the Sejvil. It is worth noting that Iran publicized one missile launch event in the 20 months prior to the announcement of the interim Joint Plan of Action in November 2013, one launch event in the 20 months during which the JCPOA was negotiated, and eight launch events in the 20 months since the conclusion of the JCPOA in July 2015.

Sources: Greg Thielmann, *Iranian Missiles and the Comprehensive Nuclear Deal*, Arms Control Association Iran Nuclear Brief, May 7, 2014, https://www.armscontrol.org/files/Iran_Brief_Iranian_Missiles_Comprehensive_Nuclear_Deal.pdf; Behnam Ben Taleblu, *Iranian Ballistic Missile Tests Since the Nuclear Deal*, Foundation for Defense of Democracies, February 9, 2017, http://www.defenddemocracy.org/content/uploads/documents/20917_Behnam_Ballistic_Missile.pdf; Iranian and foreign media reports.

A country's leaders do not have to be irrational to take irresponsible risks with potentially catastrophic consequences. By reducing the margin of error for regional decisionmakers, Iran's growing missile force could increase the potential for miscalculation and complicate efforts to create a stable deterrent balance with a potential nuclear Iran. The failure to effectively address Iran's missile program was therefore a major shortcoming of the nuclear deal and Security Resolution 2231. Iran's missile program should be an integral part of any future efforts to renegotiate aspects of the nuclear deal⁵⁶ in order to rectify its shortcomings and defuse a potential crisis should the Islamic Republic: (1) withdraw from the JCPOA because its high expectations were not met; (2) restart clandestine nuclear activities in the JCPOA's out-years, when many of its intrusive monitoring provisions disappear; or (3) opt to build an industrial-scale nuclear infrastructure, as permitted by the JCPOA, once limits on the size of its program are lifted fifteen years from now, potentially reducing its breakout time to a matter of weeks.⁵⁷

In the meantime, Washington should do what it can to strengthen the enforcement of export controls by allies, partners, and others—especially states that have joined the Missile Technology Control Regime (MTCR)—to prevent Iran from acquiring equipment and special materials needed for its missile program. It should likewise do what it can to devalue the utility of the missile component of Tehran's deterrence/warfighting triad, into which Iran has invested billions of dollars and massive human and material resources, by strengthening America's ability to deter by denial, as well as punishment.⁵⁸ Thus, the United States should continue to build up coalition missile defenses and efforts to create an integrated missile defense architecture in the Middle East; after all, Iran's missile force is a problem to which there is a viable solution—albeit an extremely costly one. It should also continue to strengthen U.S. and partner nation forces capable of delivering long-range precision fires and conducting aerial strikes against Iranian missile bases and launchers, to attrite Iran's missile force on the ground and thereby reduce the burden on coalition missile defenses.⁵⁹ These forces also provide the United States and its partners with an ability to respond in-kind to Iranian missile strikes, should they desire to do so.

Finally, the United States should ensure that coalition missile defenses are hardened against cyberattacks by Iran and its proxies. It should encourage its Gulf Arab partners to improve their civil defenses (Israel's capabilities in this area are already fairly robust). And it should counter Iranian missile propaganda and psychological warfare with a strategic communication campaign that highlights the extremely capable missile defenses of the United States and its allies, and emphasizes that Iranian missile strikes would prompt an overwhelming response in-kind by coalition air and missile forces.

BEYOND MISSILES: THE NEED FOR A COMPREHENSIVE IRAN STRATEGY

Finally, the U.S. response to Iran's growing missile capabilities needs to be nested in a comprehensive policy toward Iran that pushes back against destabilizing Iranian regional activities, strengthens the JCPOA, and in the long run—deters Iran from building an industrial scale nuclear infrastructure or attempting a nuclear breakout. To succeed in all these areas, however, the United States needs to restore American credibility. Iran has learned that it can seize embassies and violate other diplomatic norms, wage proxy warfare against the United States and other enemies, and

violate its non-proliferation commitments by building covert nuclear facilities, without incurring excessive risk of a military response. To reverse this trend, the U.S. must demonstrate—by word and deed—that it is no longer willing to accept what it accepted in the past. To this end, it should push back against destabilizing Iranian activities by:

- Responding in a more assertive fashion to Iranian harassment of U.S. naval forces in the Persian Gulf;⁶⁰
- Interdicting more vigorously Iranian arms transfers to its partners and proxies and supporting the activities of allies (such as Israel and the UAE) engaged in such activities;⁶¹
- Ramping-up support for non-Salafist rebel groups in Syria (but only after the defeat of Islamic State forces in Iraq, so as not to complicate the counter-IS campaign there). Support for non-Salafist opposition groups might help consolidate cease-fires in some places and reduce refugee flows from these areas. And it could impose costs on the Assad regime and its allies (Hezbollah, Iran, and its Shiite foreign legions) in areas where the former are not observing a ceasefire, potentially miring them in an open-ended conflict that could limit their troublemaking potential elsewhere in the region;
- Committing to a long-term security assistance relationship with Iraq to counter Iranian influence there, prevent Iraq from becoming an Iranian client state, and complicate Iranian efforts to build a land bridge to the Levant.⁶²

The intent of these measures would be to alter Tehran's cost/benefit calculus vis-à-vis Washington and induce greater caution on its part in areas where the possibility of a conflict with the United States exists.

As for the nuclear deal, it would be a mistake to tear it up; this would isolate the United States, further complicate the re-imposition of sanctions should it prove necessary, and provide Iran with a pretext to resume formerly proscribed nuclear activities. Rather, the U.S. should strictly enforce the JCPOA, try to redress its shortcomings, and maximize the productive use of the decade-plus bought by the agreement. One of the main flaws of U.S. policy toward Iran is that it pursued a time-buying agreement—the JCPOA—without a strategy for how to use the time gained. The United States needs to put together such a strategy now.

To redress the JCPOA's most critical shortcomings, Washington might consider a bilateral "more for more" agreement with Tehran in which the U.S. agrees to go beyond what is required of it by the JCPOA with respect to encouraging investment in Iran by U.S. businesses, if Iran agrees to go beyond what is required of it by the JCPOA to remedy its major deficiencies. These could include, inter alia, Iran accepting constraints on centrifuge R&D and production, missile R&D and testing, and abrogation of the sunset clause of the JCPOA—thereby abandoning its option for an industrial-scale nuclear infrastructure. Such a bilateral agreement would not require amendment of the JCPOA or the assent of the other members of the EU3+3. The main drawback of such an agreement is that it could provide Iran with economic benefits that would enable it to intensify its destabilizing regional activities, and to build up its conventional military.

However, it is hard to believe that Iran would agree to new limits on its nuclear and missile programs now that the most onerous sanctions on it have been lifted. In fact, there are no signs that Tehran is interested in an additional agreement with the United States at this time—particularly one that would require it to accept constraints on its centrifuge R&D and missile programs, or forego the option of an industrial-scale nuclear program. Nor is it clear that the benefits to Wash-

ington of a “more for more” agreement would offset the costs—especially since Washington would have to pay up-front for a commitment by Tehran to forego its option to build an industrial scale nuclear infrastructure which the Islamic Republic could always renege on at a later date, after having pocketed economic benefits for more than a decade. (It is not clear that Iran is committed to such a course of action anyhow, and its intentions in this regard may not become clear for many years to come.) Still, as long as Tehran continues to complain about the terms of the nuclear agreement, the possibilities offered by a “more for more” deal should be examined.

Finally, the U.S. should use the time gained by the JCPOA to act along four lines of effort. First, it should address loopholes and shortcomings in the existing nuclear non-proliferation and safeguards regime (to include the Additional Protocol, which will remain in effect indefinitely once the monitoring arrangements established by the JCPOA are lifted after 15-25 years), and seek support for applying some of the innovative aspects of the JCPOA more broadly, in other countries, so that Iran may be encouraged to abide by key aspects of the agreement indefinitely.⁶³ Second, the United States should put together a broad coalition to convince Iran to forego its option under the JCPOA to build an industrial-scale nuclear infrastructure once restrictions on its program are lifted after 15 years. In particular, it should work with countries that have a vested interest (economic or otherwise) in Tehran not developing an independent fuel cycle (such as Russia, which is Iran’s main supplier of nuclear fuel) to discourage, or at least not abet such a development. Third, the United States should launch a long-term information campaign to convince both the people and the regime of the dangers of nuclear fuel cycle facilities in the event of a major earthquake (nearly all of Iran is an active seismic zone) or in wartime—when they may be targeted by terrorists or neighboring states.⁶⁴ Fourth, the U.S. should leverage the enhanced credibility conferred by its pushback against destabilizing Iranian regional policies, to strengthen its ability to deter an Iranian nuclear breakout, emphasizing that traditional intelligence tradecraft and novel cyber capabilities ensure that the United States will almost certainly detect an attempted nuclear breakout by Iran, and that it will use all means at its disposal to prevent such an eventuality.⁶⁵ To this end, the United States should continue work on conventional penetrator munitions and other capabilities that will be necessary to deal with the hardened, deeply buried targets of the future.⁶⁶

¹ This testimony is an updated and abridged version of the author’s publication *The Role of Missiles in Iran’s Military Strategy*, Washington Institute for Near East Policy, Research Note No. 39, November 2016, <http://www.washingtoninstitute.org/uploads/Documents/pubs/ResearchNote39-Eisenstadt.pdf>.

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