Korea, The JCPOA, and the Shifting Military Balance in the Gulf

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Executive Summary: The sudden breakdown in the latest round of U.S.-Korean nuclear arms control talks in Vietnam should scarcely come as a surprise to anyone. Both sides sought too much too soon and did so despite a long history of previous failures. Heads of state engaged before their staffs had reached a clear compromise and did so seeking goals the other leader could not accept. It is not clear that an agreement was reachable at this point in time, but each side's search for its "best" ensured that the two sides could not compromise on the "good."

This failure sent yet another warning that agreements like the Joint Comprehensive Plan of Action (JCPOA) nuclear arms agreement with Iran that offers major progress in limiting a nation's nuclear weapons efforts can be far better than no agreement, and of the danger in letting the perfect become the enemy of the good. The failed U.S. negotiations with Korea sends a warning that any set of compromises that preserves Iran's compliance with the JCPOA, and creates a structure where negotiation can continue, will be better than provoking a crisis with Iran that can end in no agreement at all and alienate America's European allies in the process.

At the same time, however, the U.S. cannot ignore the other key aspects of regional security, any more than it can safely ignore the need for high levels of deterrence and defense capability in Northeast Asia. The U.S. must look beyond the nuclear dimension in dealing with Iran and address the other changes taking place in the regional military balance.

At present, the U.S. and its strategic partners have a major advantage in total forces, modern arms, total military spending, and the transfer of modern military technology. Iran is still a relatively weak military power when its military capabilities are judged versus the total forces the U.S., its Arab Strategic partners, and its other partners can bring to bear.

However, even if Iran's nuclear weapons programs remain under control, Iran is making significant advances in three other areas that are causing major changes in the overall military balance in the Gulf and the MENA region:

- An Iranian shift from conventionally-armed, liquid-fueled, ballistic missiles with low accuracy to a mix of precision-strike liquid- and solid-fueled ballistic and cruise missiles and UCAVS.
- The steady build-up of Iranian naval-missile-air forces that can threaten shipping naval forces, and the flow of petroleum exports through the Gulf, the Strait of Hormuz, nearby waters in the Indian Ocean, and the Red Sea.
- The steady expansion of Iran's efforts to exploit the divisions and fault lines within the Arab world through ties with state and non-state actor groups, including: the Assad regime, Hezbollah, the Iraqi government, and the Houthis in Yemen for the purpose of conducting hybrid warfare.

The U.S. needs to address these changes in the balance and try to reduce the critical divisions between its Arab security partners. In an ideal world, it could seek some broader forms of arms
control and regional security arrangements with Iran. In the real world, it must shift its focus from an ill-judged emphasis on burden sharing to creating the most effective mix of U.S. and partner defenses and deterrents as possible. This means proactive engagements with each security partner that encourage cooperation and interoperability and continued U.S. engagement in the region.

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Note: The details of the military spending, arms transfer, and military balance summarized in this analysis are explored in depth in The Arab Gulf States and Iran: Military Spending, Modernization, and the Shifting Military Balance. This report is available on the CSIS web site at https://www.csis.org/analysis/arab-gulf-states-and-iran-military-spending-modernization-and-shifting-military-balance.

The Real-World Nature of Arms Control

The first step the U.S. should take is to adopt more realistic policies regarding the JCPOA. Arms control is almost always a flawed and dynamic progress. Hostile and competing powers have to compromise to meet the demands of the other side. The key conditions that shape an agreement evolve and change as long as the parties involved continue to compete, and as new options emerge for an arms race or war.

The failure of the Washington Naval Arms Agreement of 1922 – the first modern arms control agreement after World War I – to adapt to changes in naval warfare make this all too clear. So do the success or failure to adapt to the shifts in the military impact of START, the INF Treaty, the CFE Treaty, and the Anti-Ballistic Missile Treaty. The Chemical Weapons Convention, Biological Weapons Convention, and Missile Technology Control Regime have all failed to fully come to grips with shifts in technology, and the option open to hostile powers. Even the most successful treaties are always compromises that have important gaps and limitations. Furthermore, treaties that fail to adapt inevitably fail to survive.

One obvious lesson of the breakdown of the Korea talks is that both sides were not prepared for a real-world set of compromises and could not define a process that could adapt to the need for future change. A far less obvious lesson is how good the JCPOA arms control agreement with Iran now looks in comparison. This raises two key questions for U.S. strategy and arms control policy: How should the U.S. treat Iran and the JCPOA in the future, and what strategy should it pursue towards the broader arms race in the Gulf?

Tacitly Accepting the JCPOA and Shifting the U.S Position to Use Sanctions as a Different Kind of Leverage

The U.S. has – to some extent – painted itself into a corner. The Trump Administration cannot suddenly reverse itself without serious domestic political costs, and there is no clear way it can unilaterally declare that it is now rejoining the JCPOA after withdrawing from it. The U.S. still does, however, has some options that do not require it to openly reverse its position, and which may actually advance its goals in creating a stronger set of constraints on Iran.

One option is to make it clear that it has limited immediate goals for changes in the JCPOA, and to focus on key issues, including the fact that many provisions of the JCPOA agreement will sunset in the next few years. The U.S. does not have to formally reject the impossible set of conditions it advanced in withdrawing from the agreement. It can simply limit its calls for changes in the agreement to changes that many of its European allies already support, while the U.S. ties a conditional easing of sanctions that will only continue as long as Iran meets the key conditions for now resuming its nuclear program and complying with key inspection requirements.

Working with Europe Rather than Against It

The U.S. can quietly accept European efforts to offer Iran continuing trade and financial ties, while making it clear that any serious Iranian violation of the JCPOA – or shift back towards building a nuclear weapons capability – will lead to unilateral and instant U.S. snapback of sanctions. It can also quietly seek European agreement that key states would join the U.S. under conditions where the IAEA inspections were halted or found that Iran committed a serious violation or activated any other form of nuclear weapons effort.
The same kind of arrangement could be applied to waivers of sanctions on foreign imports of Iranian oil, gas, and other goods. Once again, clear U.S. warnings that the U.S. will impose instant or quick snap back of sanctions will give the U.S. serious leverage.

The U.S. will need to show realistic tolerance of minor infractions and should not try to enforce a hair trigger in restoring sanctions. A sword of Damocles approach to arms control is something of a contradiction in terms. It does not, however, have to tolerate any Iranian action serious enough to matter.

**Dealing with the Real-World Probabilities of Regime Change**

Such a compromise would mean that the U.S. would lose the option of creating a set of sanctions so serious that they might destabilize Iran to the point they cause a revolution and bring down the current regime. Few Iranian experts feel, however, that any form of regime collapse is likely or that any form of regime collapse that did occur would do more to create a successful democracy and stable Iran than any of the other violent political upheavals in the Middle East since 2011.

While the Iranian regime does face significant internal demonstrations and protests, there does not seem to be any serious organized internal opposition. Iran's outside opposition elements also now consist of feeble efforts to restore the Shah’s son, and lobbying by a near cult that once acted as mercenaries for Saddam Hussein and seems to have negligible real-world internal support in Iran.

Strengthening the kind of "moderates" in the Rouhani government may well mean only strengthening the kind of "moderates" approved by the Supreme Leader. At the same time, such "moderates" are far better than the hardliners in the IRGC and Khamenei's immediate entourage. Moreover, an Iran that becomes addicted to economic growth, meeting the needs of its people, and dealing with the outside world is far more likely to move in a more moderate direction than one that sanctions drive into angry poverty, far more authoritarian behavior by the Leader and IRGC, and more confrontations with Israel and our Arab strategic partners.

**The Continuing Challenge of Iran's Existing Missile Programs**

Neither the US nor European should be optimistic about major limits to Iran's short to intermediate range missile programs. Iran might be willing to forgo the development of an ICBM if could not deploy one armed with a nuclear warhead. An ICBM with conventional warhead would, after all, be so limited in accuracy and lethality that it would only serve to provoke the U.S. into higher levels of escalation – the last option Iran wants to deal with.

**Iran Faces Vastly Superior Arab Gulf, Israeli, and US-European Air Forces**

At the same time, far too much of the U.S. and European focus on eliminating or limiting Iran's other missile progress has ignored the fact that the key forces behind its missile programs have previously been driven by the realities of the military balance in the region. Iran's conventionally-armed missile forces are a real threat, and Iran has used its missiles aggressively to support non-state actors like the Hezbollah, but the key motive behind Iranian missile development has been the fact that the trends in air power and air defense have overwhelmingly favored the other side.

Israel and the Arab Gulf states have been able to build-up massive modern air forces, while Iran lost access to Western modern Western arms, spare parts, and upgrades after the fall of the Shah and Iranian hostage crisis in 1979-1980. Iran has only had limited access to modern Soviet and Russian fighters like export versions of the MiG-29 and Su-24 and is only now beginning to get deliveries of modern surface-to-air missile systems like the S-300.
The IISS *Military Balance* for 2018 credits Iran with an inventory of 334 combat aircraft, but many are not operational, and many others cannot sustain combat operations for an extended period of time. Large portions of its combat aircraft inventory date back to the time of the Shah, and Iran has no modern advanced first line fighters, fighter-bombers, and attack aircraft.

The IISS credits Iran with 20 F-5B, 55+ F-5E/F Tiger II, 24 F-7M Airguard, 43 F-14 Tomcat, 36 MiG-29A/U/UB Fulcrum, and up to 6 Azaraksh fighters (a domestic variant of the F-5). Iran also has 64 F-4D/Phantom II, 10 Mirage F-1E, up to 6 Saegheh, 3 Su-22M4 Fitter K 2, and Su-22UM-3K Fitter G fighter-ground attack aircraft. It also has 29 Su-24MK Fencer D, 7 Su-25K Frogfoot (status unknown), and 3 Su-25UBK Frogfoot (status unknown) attack aircraft, 5 P-3MP Orion naval maritime patrol aircraft, and 6+ RF-4E Phantom II reconnaissance aircraft. Nearly half of these Iranian aircraft date back to the time of the Shah, and unmodified combat aircraft age in the equivalent of "dog years." None are truly modern combat aircraft.

Even if one totally ignores the threat posed to Iran by U.S., European, Israeli, and other Arab combat aircraft – and does so at a time when the F-35 is entering U.S. inventories in large numbers – Saudi Arabia alone has 360 combat aircraft. These are almost all advanced systems. They include the 56 F-15C Eagle; 25 F-15D Eagle, 67 F-15S Eagle; 23 F-15SA Eagle; 71 Typhoon, 69 Tornado IDS, 12 Tornado GR1A; 2+ Beech 350ER King Air, 5 E-3A Sentry; 2 Saab 2000 Erieye, 1 RE-3A; and 1 RE-3B. It has 48 more Eurofighter Typhoon on order.

The UAE has 156 combat capable aircraft – nearly half Iran's strength and one with far more capable aircraft that are capable of far higher and longer-lasting sortie rates. They include 54 F-16E Block 60 Fighting Falcon (Desert Eagle); 24 F-16F Block 60 Fighting Falcon; 15 Mirage 2000-9DAD; 44 Mirage 2000-9EAD; 7 Mirage 2000 RAD; and 2 Saab 340 Erieye. Oman has 58 combat aircraft with 30: 18 F-16C Block 50 Fighting Falcon; 6 F-16D Block 50 Fighting Falcon; 6 Typhoon; and more modern combat aircraft on order. Moreover, both Saudi Arabia and the UAE have precision-strike, air-launched missiles with 300-kilometer ranges.

Kuwait has 66 combat capable that include 31 F/A-18C Hornet; 8 F/A-18D Hornet; and Iraq has begun to rebuild its air force, and already has 60 combat aircraft that include 18 F-16C Fighting Falcon and 3 F-16D Fighting Falcons The remaining Arab Gulf countries are also now acquiring fleets of modern high performance fighters that outperform any combat aircraft in Iran.

The IISS *Military Balance* for 2019 notes that Qatar’s recent procurements have focused on combat aircraft. Having signed a deal for 36 Boeing F-15 Eagles in December 2017 and 24 Eurofighter Typhoons that same month, Doha exercised an option for an additional 12 Dassault Rafales in March 2018, following the 2015 deal with France for a first batch of 24.

Once these contracts are complete, Qatar will have 96 combat aircraft to replace its current fleet of 12 Mirage 2000s. Qatar is not the only country in the region looking to modernize its combat-aircraft fleet. In June 2018, Bahrain signed a contract with Lockheed Martin for 16 F-16V Block 70 Fighting Falcons, while Kuwait signed with Boeing for 28 F/A-18E/F Super Hornets. Kuwait had already signed a contract with Italy in April 2016 for 28 Typhoons.

**Missiles Are Iran's Only "Equalizer"**

Missiles have been Iran's only way of competing with these changes in Arab forces, and with massive advantages in air capability that the U.S. demonstrated in 1991 and 2003; the long-range air precision strike and air combat capabilities that Arab states have developed over the last three
decades; and the capabilities the Israeli Air Force has demonstrated in every Arab-Israel conflict since the Suez crisis. There are no accurate unclassified counts of Iran's missile forces that include all of its types, and no credible estimates of its actual deployments, ongoing development efforts, and probable future holdings. It is clear, however, that the Islamic Revolutionary Guards (IRGC) control both its missile forces and key elements of its missile production and development efforts, and that most of Iran's missile forces are now relatively limited in range and accuracy.

The IISS does not attempt to fully assess all of Iran's holdings, but it does credit the IRGC with two major missile brigades. One has Shahab-1/2 SRBM missiles and the second has Shahab-3; Ghadr-1; Sajjil-2 (in devt). There is also at least one addition battalion. Holdings of SRBM include 18+ missiles: some Fateh 110; 12–18 Shahab-1/2 (200–300 msl); some Zelzal. The IISS estimates holdings of 22+ MRBM missiles: 12+ Shahab-3/Ghadr-1 (mobile); 10 Shahab-3/Ghadr-1 (silo); some Sajjil-2 (in devt). It recognizes that Iran has cruise missiles in full development and holdings of UAVs and UCAVs, including the Shahed 129.

IHS Janes does not provide a detailed estimate of all of Iran's deployed missiles, but describes a much wider range of missile programs, cruise missile efforts, and UAVs/UCAVs – including newer missile types like the short-range Qiam 1 tactical ballistic missile, the Soumar long-range cruise missile and the Emad, – which Iran describes as described as a 'precision-guided medium-range ballistic missile' with a range of 1,700 km and a payload of up to 750 kg. It also describes a potential Iranian ICBM program.

IHS Janes does provide a more comprehensive estimate of the IRGC missile force than the IISS. It indicates that Iran's forces consist of at least five brigades. One with short-range missiles such as Fajr, one with Shahab-3/4, one equipped with Shahab 1 and 2 (Scud B and C) missiles, one with Nazeat and Zelzal short-range missiles, and a fifth whose holding are not described. It does estimate potential IRGC holdings of some Iranian missiles in mid-2018: 250 FROG, 200 Ohgab, 250 Shahin-2, 500 Nazeat 130, 200 Tondar 169, 200 Shahab-1c (Scud B), 50 Shahab 2 (Scud C), 25 Shahab 3 (No Dong 2), and 18 BM-25 – but is careful to note that Iran's holding are changing and the data are uncertain.

**Figure One** provides a graphic summary of Iran's missile types by the CSIS Missile Defense Project. It illustrates the wide range of Iran's holdings which can now threaten virtually any target in the Middle East and many in Europe and give Iran the ability to escalate its range of targets without having to strike at the United States directly.

**Seeing the Iran's Military Efforts from the "Other Side of the Hill"**

Iran's efforts to expand its regional influence, and increase its military capabilities, also have to be viewed in terms of the broader changes in the regional balance. There is no question that Iran is currently a hostile power and has threatened U.S. interests and those of its security partners, but Iran's actions also need to be seen from a broader Iranian perspective. The famous British strategist Liddell Hart – whose "indirect approach" to some extent complemented that of Sun Tzu in foreseeing the growing importance of a symmetric or hybrid warfare – stressed this point in noting that strategy must always take full account of the other side's views and plans, the "other side of the hill."

Iran's current regime has its own goals and ambitions, but it also sees the region from the perspective of Iraq's invasion of Iran in 1980, its use of missile and poison gas, its nuclear program,
and eight years of war with the highest casualty levels in the modern history of the Middle East. It sees the region from the perspective of a continuing American and Israeli threat, U.S. and European support of Iraq during the Iran-Iraq War, and Iran's "tanker war" with the U.S. in 1987-1988. It also sees the region in terms of Israel's invasion of Lebanon in 1982, the long struggle of Lebanon's Shi'ites for political equality, and the fact that the elder Assad and Syria were Iran's only regional ally during the Iran-Iraq War.

Iranian officials at least claim that they have reached out to the U.S. and Arab Gulf states like Saudi Arabia. They cite the "axis of evil" speech as an illustration that the U.S. will not respond. They also cite the massive Arab Gulf military build-up and flow of arms imports since the 1990 Gulf War as indications of the threat Iran has faced and use this to justify Iran's actions in taking countermeasures like support of the Hezbollah, elements of Bahrain's Shi'ite opposition, the younger Assad, and Houthi.

The U.S. and its strategic partners see Iran as aggressive, but Iranians do have reasons to feel that Iran's efforts to expand its regional influence have been a necessary reaction to being surrounded by hostile states. Some also point out that they did not create any of the deep and self-destructive divisions in the Arab world, they only took advantage of this self-destructiveness.

The Impact of the Trends in Military Spending and Arms Transfers

Iranians are also all too aware of the how Arab Gulf military spending and arms imports compare with those of Iran. Figure Two provides estimates of Gulf military spending based on an analysis of the reporting by two key think tanks – the International Institute of Strategic Studies (IISS) and the Stockholm International Peace Research Institute (SIPRI) – and IHS Janes, and the official U.S. government estimates in the State Department's WMEAT report.

The adjusted think tank/research center estimates of Arab GCC state spending reached some $95 to $128 billion on military forces in 2017. This was six-to-nine times greater than the estimates that Iran only spent $15 to $16 billion. It also is part of a consistent trend in such estimates. These sources show that the Arab Gulf states have sharply outspent Iran ever since 1990.

The latest official open source U.S. estimates date back to 2015, but show that the GCC states spent more than seven times what Iran spent, and the ratio is more than eight times that of Iran if Iraq is included in the Arab Gulf total – and none of these figures reflect the impact of the U.S., other Arab states, European countries active in the Gulf, or of other Arab states.

In fact, the Arab levels of spending are so high that they may have negative consequences. All the Arab Gulf states spend far more of their economies on military forces than the 2% of GDP goal set by NATO, and far less than the 3.11% that the IISS estimates is spent by the U.S., the 3.10% spent by Russia, and the 1.26% spent by China. Three Arab states – Iraq, Oman, and Saudi Arabia – spend more than 10%. While the Qatar and the UAE lack the integrity and transparency to report meaningful data on their military spending, it is likely that both obligated close to 10% or more in 2018 – driven by a surge in Qatari arms buys and the UAE's war in Yemen.

These are levels of military spending that pose at least some threat to the economic development and reform efforts in each such state that are critical to internal stability and fighting extremism and terrorism. They also make a strong case that U.S. complaints about Arab Gulf burden sharing are quantitative nonsense and that the U.S. is ignoring = cases where the spending burden on Arab security partners is so high that it may limit their capability to ensure internal stability.
The Impact of the Trends in Arms Transfers

The trends in arms transfers show an even greater Arab advantage over Iran, whose internal domestic production claims have been greatly exaggerated. The best unclassified estimates of such arms transfers are provided in a declassified official U.S. estimates of arms transfers in dollars provided by the U.S. Congressional Research Service (CRS) in Conventional Arms Transfers to Developing Nations, 2008-2015, and additional data are provided by the U.S. State Department in WMEAT.

There are many uncertainties in making such estimates, but it is still clear from the data in Figure Three that the Arab Gulf nations have spent far more on arms imports than Iran. The ratio of Arab superiority in new arms agreements was 260:1 in 2008-2011, and 141:1 in 2012 to 2015. The overall superiority was 181:1 during 2008-2015. Moreover, the Arab Gulf states had far better access to the advanced arms and military technology available from the U.S. and Europe. Iran has only had limited access to advanced Russian and Chinese arms, and only very limited covert access to modern western arms since 1980.

The Current Practical Limits of Arms Control

Iran has helped provoke the regional arms race, but it has also been trapped by it. It is not going to give up an element of its military security like missiles because of unilateral UN resolutions, much less bargain it away in arms control agreements that do not offer it broader regional security. Iran is not going to passively accept the vulnerability of all its key civil and military strategic targets, or its deterrent and military advantages in being able to strike the key civil and military assets in Arab states and Israel – or the advantages in payload, lethality, guidance sophistication and penetration aids that larger missiles offer when they are conventionally armed.

As Hezbollah and the Houthis demonstrate, missile transfers and technology assistance also give Iran major advantage in arming friendly movements, and using arms transfers as political and strategic leverage. Here, it is important to point out that Iran has been competing directly with its Arab neighbors for strategic influence and basic security ever since the Iraqi invasion in 1990, as well as engaged in a low-level tanker war with the U.S. in 1987-1988.

Labeling Iran as the aggressor has some justification, but Iran has considerable justification as its actions as well. Iran's constant struggle for greater strategic influence is matched by a similar struggle by Arab states, Israel, and the U.S. So is its competition for influence over non-state actors. And, in both cases, missiles not only offer Iran critical advantages, but ones for which it has any equally affordable and effective options.

Seeking to Reduce the Broader Arms/Influence Race in the Gulf and the Region

At the same time, the United States does need to reassess other aspects of the regional military balance. In spite of Iran's military disadvantages, and its compliance with the JCPOA, it is still able to create serious problems for the United States and its strategic partners. Iran's missile and air threats are in the process of radical change. The threat Iran presents to shipping and naval forces in and near the Gulf is steadily increasing. And, Iran is increasingly able to exploit the divisions in the Arab world.

The Changing Air-Missile Threat

In the case of the air threat, Russia has sold Iran its first major modern land-based surface-to-air missile defense system since the fall of the Shah, and the JCPOA permits the sale of modern
combat aircraft to Iran in 2025. According to IHS Janes, Iran will receive four complete S-300PMU2 batteries. They began to arrive in country in July 2016, and have probably been active since March 2017.

IHS Janes indicates that each battery consists of a 96L6E target acquisition radar, a 30N6E2 target engagement radar, and four 5P85TE2 towed transporter-erector-launchers (TELs). The launchers are linked to two 64N6E2 battle management radar using FL-95 antenna masts. The S-300 MPU-2 has an engagement envelope of 200 km, and the 64N6E2 has a 300 km range. This greatly expands Iran's effective coverage.

Other sources indicate that Iran is rapidly upgrading its integration of sensor and command control data to at least cover key strategic areas. With the exception of the F-22, F-35, and B-2 this should significantly improve Iran's weak air defense system, and Russia may eventually make the S-400 and S-500 air and missile defense systems available.

The most serious change in Iranian capability, however, is its fielding of a generation of conventionally armed precision-guided ballistic and cruise missiles with the accuracy and lethality to replace nuclear-armed weapons of mass destruction with something approaching the stats of weapons of mass effectiveness in a region with uniquely high military and civil vulnerabilities.

Reports on the details of such changes are still highly uncertain, and often conflicting. They are few technical data and little supporting evidence regarding the levels of actual Iranian progress in achieving operational improvements in precision. Iran has made it clear, however, that it is seeking such improvements, and its short-range missile launches have shown a major increase in accuracy.

This can have a major impact on the balance. Uzi Rubin, a noted Israeli expert on missile warfare has noted that Iran is already able to use its forces – and equip forces like Hamas, Hezbollah, and the Houthis – to present a serious missile and rocket threat.

Rubin quotes former Iran MoD, Ali Shamkhani, who said in 2007 that, "Iran will launch a blitz of missiles on the Gulf States, targeted not only on US bases in the region but also strategic targets such as refineries and power stations… the objective will be to overwhelm the US missile defense systems by tens if not hundreds of missiles that will be fired simultaneously against selected targets". Rubin notes that Iran has since conducted a mass Hamas missile attack from Gaza during November 11-13, 2018. A total of 260 rockets were fired in the first 30 minutes, and 460 were fired in the first 48 hours.

Rubin also notes, however, that such mass attacks are far less necessary when an individual missile is accurate enough to reliably destroy or cripple a target and/or has penetration aids, when older missiles are fired to help saturate missile defenses, or when high performance cruise missiles are used. He warns that Iran is developing and deploying a generation of far more accurate systems – some with solid fueled engines and others that are smart cruise missiles with warheads that can use optical tracking or terminal imagery.

Rubin and other sources list the following systems – although the actual development status of many is uncertain, and initial operating dates are often conflicting, and most range-payload and accuracy claims have no clear test reports:

- **Kader (Qader), 2011 (2004?) – 300 Km range anti-ship, shore target cruise missile with steadily improved operational accuracy and reliability.**

- **Soumar, 2015 – ground-launched cruise missile. Iran claims it has” different characteristics in terms of range and pinpoint accuracy in comparison with the previous products.” Claimed to have**
a maximum range of up to 3,000 km. May be derived from the Russian-made Raduga Kh-55.

- Fajer (Fadjer) 5C, 2017: A guided (?), or more accurate solid fuel artillery rocket based on weapon that had a maximum range of 75 km and claimed CEP (circular error of probability) of 4% of range.
- Fateh 110, 2000, short-range, road-mobile, solid-propellant ballistic missile with 200-300Km range with a 450-500 Kg warhead. Probably a modified version of the unguided Zelzal-2, and some claims have guidance systems (GPS?) accurate to a 100-meter CEP.
- Fateh 313, 2015 – solid-fuel short-range ballistic missile, Almost identical to the Fateh-110 missile, but uses a new composite fuel and body and increased range to 500 km.
- Hormuz-1, 2014 – anti-radiation version of Fateh-110, designed to strike land-based and sea-based radar emitting platforms and stations at ranges up to 300 km. May use an electro-optical/infrared (EO/IR) seeker for its terminal guidance phase.
- Zulfikar (Zolfaghar), 2017 – another member of the Fateh family, with a 700 Km range and Iran claims is equipped with a submunition warhead.
- Dezful, 2019 – Iran states is a longer-range version of the Zulfikar with a 1,000 km range.
- Qiam 2, 2018 – a liquid fueled, short-range ballistic missile (SRBM) with a 750 Kg fragmentation or submunition warhead, and 700-800 Km range. Developed and deployed by Iran which may be a "precision" strike version of the Qaim 1 – an indigenous variant of the Shahab-2 SRBM and had an improved guidance system that can more quickly detect and correct changes in its trajectory, removing the need for stabilizing fins in boost phase.
- Khorramshahr, 2017 – intermediate-range ballistic missile, with range of 1,000-2000Km. Similar to North Korea’s Hwasong-10 (KN-07) liquid-fueled missile with a maximum range of 2,000 km. Early versions of the Hwasong-10 may have been sent to Iran early 2000s. Development status and any precision guidance status uncertain.
- EMAD, 2017 (2015?) – liquid-fuel, medium-range ballistic missile (MRBM), a derivative of Shahab-3. Some reports indicate can carry a 750 kg payload at a range of 2,000 km with 30 m accuracy

There is no way at this point to know how soon Iran will deploy a major precision missile strike force, but it seems unlikely that this will now take even half-a-decade. When it does, it will make a radical advance in its relative air and missile strike capabilities against one of the most vulnerable target bases in the world.

Many Gulf Arab military targets and bases are well under 700 km from potential dispersed Iranian launch sites. Virtually all have critical points of vulnerability in terms of key point target facilities, power, water, communications, and key command and control facilities. Sheltering has generally focused on aircraft and on a few key C4I/BM facilities. Some key systems rely heavily on a given target point. It does not take sophisticated equipment to target such facilities. Their exact GPS location can be read and catalogued in peacetime using a device no bigger than a cell phone, and easily imaged and read at a distance.

The Arab states have a wide range of highly vulnerable petroleum production, processing, and export facilities near or in the Gulf, some of which are illustrated in Figure Four. None are fully sheltered, most pipeline alternatives are closed, and almost all such facilities are highly vulnerable and have critical components that can take months or years to replace.

Iran has been analyzed these vulnerabilities since at least the early 1970s, along with other key vulnerabilities like the Arab Gulf’s extraordinary dependence on safe, portable water and electric power from its desalination plants and maritime and air civil cargo deliveries. A dated map of these desalination facilities is shown in Figure Five. As is the case with Gulf energy facilities, little
effort has been made to avoid open assessment of GPS coordinates and target vulnerabilities, and commercial satellite coverage is readily available.

Iran has its own vulnerabilities to air and missile attack, and is also highly dependent on imports. Iran, however, is almost certainly not shaping its forces to actually fight a major war. It has no incentive to engage in a conflict where it will suffer as least as much as its enemies.

Iran's strategic goals are to deter any form of major attack on Iran in response to its use of asymmetric/hybrid political and low-level attacks and uses of violence. Once it deploys precision missile forces, its Arab neighbors will face major – if not unacceptable – risks of reprisals in fighting any form of war that involves attacks on key Iranian targets unless they can create far more effective ballistic and air/cruise missile defenses than currently seem likely.

**The Changing Naval Threat in the Gulf and Red Sea**

Creating precision strike missile forces will also ensure that the Arab Gulf states will have to be more cautious in responding to the improvements Iran is making in its capabilities to conduct an asymmetric naval-air-missile war in the Gulf, and one that could have a major impact on the world's supply of energy. The U.S. Energy Information Administration (EIA) estimated in 2018 that,

...the Strait of Hormuz is the world's most important chokepoint, with an oil flow of 17 million b/d in 2015, about 30% of all seaborne-traded crude oil and other liquids during the year. In 2016, total flows through the Strait of Hormuz increased to a record high of 18.5 million b/d... about 80% of the crude oil that moved through this chokepoint went to Asian markets, ...China, Japan, India, South Korea, and Singapore are the largest destinations for oil moving through the Strait of Hormuz. (In addition) Qatar exported about 3.7 trillion cubic feet per year of liquefied natural gas (LNG) through the Strait of Hormuz in 2016, according to BP’s *Statistical Review of World Energy* 2017. This volume accounts for more than 30% of global LNG trade. Kuwait imports LNG volumes that travel northward through the Strait of Hormuz.

This Iranian threat already is all too real. Iran has gradually built up a major naval-missile-air capability for hybrid warfare in the Gulf from Kuwait to the Strait of Hormuz, in the Gulf of Oman and Indian Ocean outside the Strait, and in the Red Sea. This threat is tailored more to threaten tanker and shipping traffic than fight an actual war, but it has considerable capability to threaten combat ships in the Gulf and Red Sea as well.

Iran not only has steadily improved its forces near the Strait of Hormuz, it has built up a series of dispersal bases along its entire Gulf coast, and in many of its islands. It has a major force of missile patrol craft, fast suicide attack boats, submersibles, land/sea/air-based anti-ship missiles, smart mines, and marine/naval special forces to carry out such a conflict.

Once again, open sources differ over the details of Iran's forces. The IISS estimated in 2018, however, that the Iran Revolutionary Guards Corps (IRGC) had some 126 patrol boats and coastal combatants, including 56 missile patrol boats – plus a 5,000-man marine force and five landing ships and craft. It estimated that the Iranian Navy had seven missile frigates, 67 more patrol boats and coastal combatants; three submarines and 18-21 submersibles; AShM C-701 (Kosar); C-704 (Nasr); C-802; HY-2 (CH-SSC-3 Seersucker coastal defense missiles; and 12 landing ships and 11 landing craft. As noted earlier, the Iranian air force had three Orion maritime patrol aircraft and steadily improving mixes of air-launched anti-ship missiles, anti-ship ballistic and cruise missiles, and UAVs.

There is a broad consensus that Iran's forces continue to increase in numbers and technical sophistication. As is the case with near-term Iranian missile attacks, the U.S., its Arab Gulf
partners, and its other allies should still be able to out escalate Iran in a major war. However, such a war would inflict massive damage on the Arab states as well. Any escalation to a more serious conflict naval conflict in the Gulf would have a massive impact on both the global economy and the U.S. economy.

Moreover, U.S. experts are concerned that Iran might initiate a low-level conflict based on sporadic attacks on tanker and commercial shipping. It might pursue such a strategy to put pressure on a given Arab state, or states, feeling that the reaction would be limited and uncertain, and one where the benefits outweighed the cost. The fact that Iran can pose such a threat – or actually execute such a campaign – presents another hybrid threat that Iran can exploit.

The U.S. is not immune to the effects of such attacks. It has reduced its dependence on petroleum imports from 8.2% of its crude oil imports in 2008 to nearly zero. However, the CIA estimates that the U.S. economy depended on $2.36 million in imports in 2017, and $1.55 trillion in exports – a trade volume equal to $3.91 trillion or some 20% of its total GDP in PPP terms.

Even in 2008, America’s other commodity imports included agricultural products 4.9%, other industrial supplies 24.7%, capital goods 30.4% (computers, telecommunications equipment, motor vehicle parts, office machines, electric power machinery), and consumer goods 31.8% (automobiles, clothing, medicines, furniture, and toys). The U.S. has long been far more dependent on the global economy, other imports, and its exports than on petroleum imports. Moreover, like every other country in the world, it would have to pay the same price as all other consumers if a conflict or crisis raised the world market price of oil and petroleum products.

The flow of Gulf oil is also critical to the economy of some of America's major trading partners than as the global economy. In 2018, the U.S. Census Bureau reports that these include five out of 15 top trading partners that that were critically dependent on Gulf petroleum exports: China (15.6% of U.S. trade; 21.1% of imports, Japan (5.1% of trade, 5.6% of imports), South Korea (3.1% of trade, 2.9% of imports), India (2.1% of trade, 2.2% of imports) and Taiwan (1.8% of trade and imports). As a result, U.S. cuts in petroleum imports do not make the Gulf less of a vital U.S. strategic interest.

The Challenge of Lebanon, Syria, Iraq, Yemen, Afghanistan, and the Arab Gulf's Shi'ites

Iran has found that a pragmatic willingness to exploit the fracture lines within and between Arab countries can serve its purposes and divide the Arab world – regardless of whether Iran comes to dominate any given Arab state or create some formal kind of strategic axis. It is enough for Iran if its opponents lose influence, and these is always the hope of creating a real strategic partner— one that could have critical benefits in the cases of Iraq and Syria.

Far too many of Iran's Arab – and its U.S. and Israeli – opponents make the mistake of assuming that Iran must "win." It doesn't as long as they lose or face growing uncertainty. Here the U.S. needs to be far more careful about suddenly announcing cuts in its forces in the Gulf and reducing its influence. At best, the result of premature US. cuts will be to raise the already uncertain profile of Turkey and Russia, and feed the ethnic and sectarian divisions within the region. At worst, it will be replacing a reasonable level of deterrence and stability with even worse levels of outside and regional competition and possibly conflict.

What is needed is a predictable, continuing and proactive U.S. security role in the Gulf
Self-Destructive Security Partners

Finally, the U.S. must deal with challenges from its security partners. Some are indirect: these problems include the hardening of Israel's treatment of the Palestinians, Egypt's shift towards authoritarianism, and the slow attrition of European power projection capabilities.

It is America's Arab security partners, however, whose problems most directly affect the U.S. security position in the Gulf. The key challenges posited by such partners include the continuing failure of the Arab Gulf states to transform the Gulf Cooperation Council (GCC) into an effective alliance – and the lack of integration and interoperability in Arab Gulf forces. They also include the petty feuding between rulers and princes, and the extraordinarily self-destructive split caused by the Saudi-UAE-Bahraini boycott of Qatar.

There is no way to estimate how much money is wasted by the lack of integration and interoperability in Arab Gulf forces, or just how serious the impact of the boycott will be. The internal divisions with the in GCC do, however, make it extremely difficult to create a cost-effective structure of air and missile defense, level of deterrent air and missile offensive capability, and cost-effective naval forces for the Gulf and Indian Ocean/Red Sea. They are compounded by the slow and limited pace of Arab Gulf efforts to reach out to Iraq and offer it incentives that will help unite it and make it a stronger independent state.

The U.S. has made its own mistakes. They include invading Iraq and dealing with the invasion's aftermath and focusing too narrowly on defeating given elements of the terrorist threat, rather than dealing with its causes. They also include a near decade of failure to adopt a credible strategy for Syria, and increasingly uncertain efforts to help create an Israeli-Palestinian peace.

Ultimately, however, the key source of such problems has been America's Arab strategic partners. For all the cosmetic efforts to create new Arab alliances, and talk about an "Arab NATO," it is Arab self-inflicted wounds that have been the key reason that Iran has expanded its influence in the region and have given Iran's opportunities for asymmetric warfare.

Arms Race, Deterrence, or Arms Control

Given all of these challenges, the U.S. not only needs to stay in the Gulf, it needs to understand that as important as finding a better approach to the JCPOA may be, it also needs to concentrate on making significant improvements in its military posture and the level of cooperation and force development between its Arab security partners.

This is scarcely the ideal approach to regional security. From some purely rational perspective, all of the sides involved in the current arms race in the Gulf would long have benefited from a mix of security and arms control arrangements that avoided the region's crises and wars, and its unstable outside security ties. It is equally clear, that any broader regional security and arms control agreements that limited key aspects of the arms race, avoided destabilizing shifts in Arab military forces, and addressed the continuing causes of terrorism and extremism would have benefited every country in the region.

In the real world, however, the most that now seems possible by way of arms control and regional security agreements is to find a compromise that preserves and possible reinforces the JCPOA. One does not have to be a pessimist to be pessimistic about the near-term prospects for some form of working regional security agreement that involves both Iran and the Arab Gulf states and that gives outside powers a more constructive role. The same is true of additional efforts in arms control.
The best real-world opportunities for achieving regional stability in ways that deal with the changing Iranian threat seem to be ones that involve America's strategic partners.

The first such opportunity is a full-court U.S. diplomatic and security effort to end to the split between Qatar and Saudi Arabia, the UAE, and Bahrain. Putting an end to a tempest that borders on a tantrum does not require any side to win, simply some form of cosmetic political cover for an already uncertain level of unity that should never have been shattered in the first place.

The second is a major Arab Gulf effort to help Iraq recover in both economic and military terms and create as strong and independent an Iraq as possible. Such an effort does need to cut across sectarian and ethnic lines and avoid trying to force Iraq to reject all ties to Iran, but also be enough to create a stable country. Trying to force Iraq to make choices that can divide it or confront it with new security challenges will not serve anyone's interests.

The third opportunity is to work with each regional security partner in ways that reinforce collective deterrence and defense – focusing U.S. force development on ways that strengthen deterrence, defense, and counter-extremism throughout the Gulf and MENA regions. It is to reject a focus on "burden sharing" that means asking strategic partners to do more while the U.S. deploys smaller forces and pays less. It instead means working with each partner to find the best mix of U.S. and partner capabilities, seeking to increase cooperation among partners and their efforts at key steps to link interoperability and a focus on key missions, and recognizing their need to invest in civil development and stability as well as security – steps that will be the core effort in ending extremism and terrorism.

The final opportunity is to make it clear to Iran, and especially to Iran's moderates and the Iranian people, that Iran has a real alternative in dealing with the U.S., the Arab world, and Israel. It means making clearly defined offers that show Iran can move towards better relations with the Arab Gulf states as an alternative to more Iranian military spending, tensions, and the risk of war.

Here, the same steps that can help ensure deterrence and defense in a continued confrontation with Iran can act of leverage in achieving better relations. For example, a joint U.S.-Arab Gulf effort to create integrated air and missile defense capabilities would be key area of action, and one that could be scaled down to fit any reduction in the growth of the Iranian missile threat. Such an effort could also be linked the given the Arab Gulf better deep strike air and land-based missile capabilities in ways that could be scaled down in proportion to Iranian restraint.

The same would be true of a joint U.S.-Arab Gulf effort to create naval defense capabilities in the Gulf – ones that could be expanded to the Gulf of Oman and Red Sea. So would an effort to internationalize aid to Yemen in achieve recovery and stability and the provide some pattern of aid to reduce the Sunni-Shi'ite tensions in Bahrain, and to address the key civil causes of extremism in Arab states.

Here, words and the ways in which the U.S. approach regional security issued also matter. The fact that there do not seem to be current real-world prospects for broader arms control or regional security agreements does not mean that there are no prospects for dialogue and more informal efforts, and that demonizing Iran will enhance U.S. and partner security. The present rhetoric on all sides has already become far too negative. The U.S. should never downplay real risk and real threats. However, it can pursue security in ways that help create better understanding, encourage restraint, and lead to some form of eventual compromise.
Iran possesses the largest and most diverse missile arsenal in the Middle East, with thousands of short- and medium-range ballistic and cruise missiles capable of striking as far as Israel and southeast Europe. Missiles have become a central tool of Iranian power projection and anti-access/area-denial capabilities in the face of U.S. and Gulf Cooperation Council naval and air power in the region.

**Figure One: Iran's Ballistic Missiles**

<table>
<thead>
<tr>
<th>Missile</th>
<th>Class</th>
<th>Range</th>
<th>News</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safir</td>
<td>SLV</td>
<td>350 km altitude</td>
<td>Operational</td>
</tr>
<tr>
<td>Khorramshahr</td>
<td>MRBM</td>
<td>2,000 km</td>
<td>In Development</td>
</tr>
<tr>
<td>Qiam 1</td>
<td>SRBM</td>
<td>700-800 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Shahab 1</td>
<td>SRBM</td>
<td>385-330 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Simorgh</td>
<td>SLV</td>
<td>500 km altitude</td>
<td>In Development</td>
</tr>
<tr>
<td>Koeisan M1978</td>
<td>Artillery</td>
<td>40-60 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Zolfaghar</td>
<td>SRBM</td>
<td>700 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Emad (Shahab-3 Variant)</td>
<td>MRBM</td>
<td>1,700 km</td>
<td>In Development</td>
</tr>
<tr>
<td>Sejjil</td>
<td>MRBM</td>
<td>2,000 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Shahab 2 (Scud C- Variant)</td>
<td>SRBM</td>
<td>500 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Shahab 3</td>
<td>MRBM</td>
<td>1,800 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Ghadr 1 (Shahab-3 Variant)</td>
<td>MRBM</td>
<td>1,550 km</td>
<td>In Development</td>
</tr>
<tr>
<td>Fateh 110</td>
<td>SRBM</td>
<td>100-300 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Tendar 69</td>
<td>SRBM</td>
<td>150 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Soumar</td>
<td>Cruise Missile</td>
<td>2,000-3,000 km</td>
<td>Operational (presumed)</td>
</tr>
<tr>
<td>Ra'ed</td>
<td>Cruise Missile</td>
<td>150 km</td>
<td>Operational</td>
</tr>
</tbody>
</table>

**Figure Two: Iranian versus Arab Gulf Military Spending**

<table>
<thead>
<tr>
<th></th>
<th>Think Tank/research Center Estimate as of 2017</th>
<th>U.S. Official Estimates in WMEAT: 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$US 2017 Millions</td>
<td>% of GDP</td>
</tr>
<tr>
<td><strong>Iran</strong></td>
<td>16,035</td>
<td>3.75</td>
</tr>
<tr>
<td><strong>Bahrain</strong></td>
<td>1,480</td>
<td>-</td>
</tr>
<tr>
<td><strong>Kuwait</strong></td>
<td>5,710</td>
<td>-</td>
</tr>
<tr>
<td><strong>Oman</strong></td>
<td>8,687</td>
<td>-</td>
</tr>
<tr>
<td><strong>Qatar</strong></td>
<td>6,120</td>
<td>5,676</td>
</tr>
<tr>
<td><strong>Saudi Arabia</strong></td>
<td>76,678</td>
<td>52,098</td>
</tr>
<tr>
<td><strong>UAE</strong></td>
<td>30,000</td>
<td>19,760</td>
</tr>
<tr>
<td><strong>Total GCC</strong></td>
<td>128,675</td>
<td>95,086</td>
</tr>
<tr>
<td><strong>Iraq</strong></td>
<td>19,271</td>
<td>7,783</td>
</tr>
<tr>
<td><strong>Total Arab</strong></td>
<td>147,946</td>
<td>102,869</td>
</tr>
</tbody>
</table>

Figure Three: Conventional Arms Transfers to Iran and the Arab Gulf States 2008-2015
(Gulf Arms Agreements & Deliveries in millions current USD)

<table>
<thead>
<tr>
<th>Total Arab Gulf versus Iran</th>
<th>2008-2011</th>
<th>2012-2015</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Arms Agreements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arab GCC</td>
<td>78,100</td>
<td>84,400</td>
<td>162,500</td>
</tr>
<tr>
<td>Iran</td>
<td>300</td>
<td>600</td>
<td>900</td>
</tr>
<tr>
<td>Ratio [GCC:Iran]</td>
<td>260:1</td>
<td>140.7:1</td>
<td>180.6:1</td>
</tr>
<tr>
<td>Iraq</td>
<td>5,200</td>
<td>23,900</td>
<td>29,100</td>
</tr>
<tr>
<td>Actual Arms Deliveries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arab GCC</td>
<td>19,200</td>
<td>30,400</td>
<td>49,600</td>
</tr>
<tr>
<td>Iran</td>
<td>300</td>
<td>100</td>
<td>400</td>
</tr>
<tr>
<td>Ratio [GCC:Iran]</td>
<td>64:1</td>
<td>304:1</td>
<td>124:1</td>
</tr>
<tr>
<td>Iraq</td>
<td>3,700</td>
<td>10,300</td>
<td>14,000</td>
</tr>
</tbody>
</table>

Arms Transfers by Country

<table>
<thead>
<tr>
<th>Country</th>
<th>Arms Agreements</th>
<th>Arms Deliveries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>52,500</td>
<td>41,000</td>
</tr>
<tr>
<td>Other GCC Countries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bahrain</td>
<td>400</td>
<td>500</td>
</tr>
<tr>
<td>Kuwait</td>
<td>3,300</td>
<td>4,700</td>
</tr>
<tr>
<td>Oman</td>
<td>3,300</td>
<td>7,200</td>
</tr>
<tr>
<td>Qatar</td>
<td>1,000</td>
<td>22,900</td>
</tr>
<tr>
<td>UAE</td>
<td>17,600</td>
<td>8,100</td>
</tr>
<tr>
<td>Total GCC</td>
<td>78,100</td>
<td>84,400</td>
</tr>
<tr>
<td>Iraq</td>
<td>5,200</td>
<td>23,900</td>
</tr>
<tr>
<td>Iran</td>
<td>300</td>
<td>600</td>
</tr>
<tr>
<td>Yemen</td>
<td>800</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure Four: The Gulf's Vulnerable Energy Targets

Major Petroleum Facilities

![Map of the Gulf's petroleum facilities]

Source: Adapted from the Diercke International Atlas as shown in Google Maps

Key Pipelines

![Map of key pipelines]

Source: Adapted from the Diercke International Atlas as shown in Google Maps and Wikimedia Commons
Figure Five: The Arab Gulf’s Vulnerable Desalination Plants

- 1,483 water processing units or 57.9% of global capacity
- 85%+ of Kuwait’s supply
- “Riyadh would have to evacuate within a week… the current structure of the Saudi government could not exist without the Jubail Desalination Plant.”
- 30%+ of UAE
- 75% of Qatar’s use

Note: Multi-stage flash distillation (MSF) is a water desalination process that distills sea water by flashing a portion of the water into steam. Multiple-effect distillation (MED) is a distillation process often used for sea water desalination. It consists of multiple stages or “effects”. In each stage the feed water is heated by steam in tubes, usually by spraying saline water onto them. Some of the water evaporates, and this steam flows into the tubes of the next stage (effect), heating and evaporating more water. Each stage essentially reuses the energy from the previous stage, with successively lower temperatures and pressures after each one. Additionally, between stages this steam uses some heat to preheat incoming saline water. **RO is reverse osmosis**


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