FARZIN NADIMI

Iran's Evolving Approach to Asymmetric Naval Warfare

Strategy and Capabilities in the Persian Gulf

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THE AMERICANS' KNOWLEDGE OF US IS VERY, VERY LIMITED, AND WHEN THEY DO START TO LEARN, IT WILL BE TOO LITTLE, TOO LATE, AND THEIR SHIPS ARE ALREADY STARTING TO SINK."

—Cdre. Ali Fadavi, former IRGCN commander, on live television

"AMERICANS CLAIM THEY WANT TO CURTAIL IRAN'S OIL EXPORTS...[BUT] IT WOULD BE UNACCEPTABLE THAT THE WHOLE REGION EXPORTS ITS OIL WHILE IRAN CANNOT. TRY IT IF YOU CAN, AND SEE WHAT HAPPENS NEXT!"

—Iranian president Hassan Rouhani, speaking during a state visit to Switzerland

"UNDER CONCEIVABLE CIRCUMSTANCES... THE ENEMIES WILL BE MADE TO UNDERSTAND WHAT [WE MEAN WHEN WE SAY] THE STRAIT OF HORMUZ SHOULD BE USED BY ALL OR NONE."

—Div. Gen. Mohammad Ali Jafari, former IRGC general commander

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INTRODUCTION

The U.S. withdrawal in May 2018 from the Iran nuclear deal came with promises to reimpose an array of strict sanctions on the Islamic Republic. As part of the overall effort, Washington has pressured Tehran's traditional oil customers to stop importing Iranian oil altogether. This "maximum pressure" move has successfully hampered Iran's access to its main source of foreign currency and unrestricted barter. According to Iran's Islamic Parliament Research Center, if national oil exports continue to fall, the regime might be forced to withhold all deposits to its national development fund in 2019; by law, up to 20 percent of oil, condensate, and gas revenue must be deposited into a special savings account.[1] In February 2019, Ali Shamkhani, the secretary of Iran's Supreme National Security Council, asserted that his country had a variety of options, other than closing the Strait of Hormuz, for stopping the flow of oil from the Persian Gulf in response to any stoppage of Iranian oil exports.[2]

In the Persian Gulf and Strait of Hormuz, one Iranian means of aggressive messaging is through noisy naval maneuvering around passing Western warships. While Iran is unlikely to attempt another opportunistic seizure of Western vessels and sailors any time soon, as it did in 2007 and 2016 with British and U.S. sailors, respectively, likelier scenarios would be interference in Western surveillance drone activities or boosting its support for Yemeni Houthi disruption of freedom of navigation in the Bab al-Mandab Strait. Moreover, the Saudi-Iran rivalry occasionally reaches uncharted territory: Bahrain continues to experience occasional periods of unrest and terrorist activity, relations between Qatar and other Gulf Cooperation Council (GCC) members remain in tatters, and the threat of Islamist terrorism with possible maritime dimensions persists despite the temporary receding of the Islamic State and al-Qaeda. Therefore, potential trigger points abound. All the while, the Islamic Republic continues to expand its regional influence using whatever means possible.

Besides these mostly unsettling trends, since 2008, when the author published his first Washington Institute study on Iran's asymmetric naval warfare capabilities,[3] the Islamic Republic has developed and fielded numerous new weapons systems and tactics, and the national and revolutionary navies have largely completed a comprehensive separation of their geographical areas of responsibility. This undertaking was necessary to establish a two-tier strategy meant not only to wage conventional and unconventional naval warfare closer to home, but also to maintain a naval presence well beyond the Gulf of Oman eastward into the open seas.

Iranian navies have in the meantime been the subject of numerous serious studies, in particular the 2009 and 2017 reports by the Office of Naval Intelligence, as well as several scholarly debates about Iranian capabilities to threaten regional assets vital to the West.[4] The present edition is substantially updated from its predecessor and is furnished with useful reference material. It looks closely at the newest capabilities developed by the Islamic Republic in order to strengthen its deterrence and threaten the export of oil from the region if its deterrence fails. It also offers a fresh look at how the Islamic Revolutionary Guard Corps (IRGC)—the primary asymmetric warfighter in the Islamic Republic—has developed a firm ideological platform and propaganda machine to support and supplement its technological and numerical buildup.

The study's main message is that based on its doctrine of naval warfare, the Iranian revolutionary naval forces have embarked on a fast-paced rearmament and reequipment program during the past two decades, aimed at offsetting the U.S. Navy's military presence in the Persian Gulf region. Ideologically, the mariner Guardsmen are as zealous now as ever about fighting against the Western navies in the Gulf and their allies, despite the presence of a slightly moderate government in Tehran and the maturation of a younger and more disenchanted population. IRGC leaders appear to be confident that the dense layered defenses they have created, along with their much-vaunted swarming and other bold tactics, and especially the fear imparted by their bold martyrdom culture, will deter an attack against their territory and interests. These layered defenses distinguish Iran among its peers in the Middle East.

NOTES

1 See report by the Islamic Parliament Research Center (in Persian), December 2018, 13, http://rc.majlis.ir/fa/report/download/1108849.

2 Tasnim News Agency, "Shamkhani: We Have a Variety of Options to Stop the Flow of Oil from the Persian Gulf" (in Persian), February 23, 2019, https://tn.ai/1953761.

3 Fariborz Haghshenass, *Iran's Asymmetric Naval Warfare*, Policy Focus 87 (Washington DC: Washington Institute, 2008), https://washin.st/2CmAFu2. Farzin Nadimi, the author of this volume, previously wrote under the pseudonym Fariborz Haghshenass.

4 In recent decades, two sets of events have mobilized urgent study of the strategic, operational, and tactical role of the Iranian naval forces: the Tanker War during the 1980s and, more recently, threats periodically issued by Iran to close the Strait of Hormuz following political disputes with the West. A few open-source studies look at various aspects of these matters. Notable examples are the Office of Naval Intelligence's 2009 and 2017 reports as well as several scholarly debates about Iranian capabilities to threaten regional assets vital to the West. See Office of Naval Intelligence: *Iran's Naval Forces: From Guerilla Warfare to a Modern Naval Strategy* (Suitland, MD: ONI, 2009), https://fas.org/irp/agency/oni/iran-navy.pdf, and *Iranian Naval Forces: A Tale of Two Navies* (Suitland, MD: ONI, 2017). Also see Joshua Himes, *Iran's Two Navies: A Maturing Maritime Strategy* (Washington DC: Institute for the Study of War, 2011), http://www.understandingwar.org/sites/default/files/Irans_Two_Navies.pdf, and Christopher Harmer, *Iranian Naval and Maritime Strategy* (Washington DC: Institute for the Study of War, 2013), http://bit.ly/2O6sHdv. The Congressional Research Service has produced several detailed studies, such as Kenneth Katzman et al., *Iran's Threat to the Strait of Hormuz* (2012), https://fas.org/sgp/crs/mideast/R42335.pdf, as has the U.S. Naval War College, e.g., Philip G. Laquinta, *"The Emergence of Iranian Sea Power"* (1998), https://apps.dtic.mil/dtic/tr/fulltext/u2/a348948.pdf. Other studies focused on Iranian naval capabilities are David B. Crist, *Gulf of Conflict: A History of U.S.-Iranian Confrontation at Sea*, Policy Focus 95 (Washington DC: Washington Institute, 2008), https://washin.st/2F5nM9u; Caitlin Talmadge, *"Closing Time: Assessing the Iranian Threat to the Strait of Hormuz," International Security* 33, no. 1 (Summer 2008): 82–117, and author correspondence with a reviewer in later issues; "Iranian Military Capability 2011: Naval Forces," Open Source Intelligence Project, 2011; Mark Gunzinger with Chris Dougherty, *Outside-In: Operating from Range to Defeat Iran's Anti-Access and Area-Denial Threats* (Washington DC: Center for Strategic and Budgetary Assessments, 2011); and Anthony H. Cordesman, *The Iranian Sea-Air-Missile Threat to Gulf Shipping* (Lanham, MD: Rowman & Littlefield, 2015), http://bit.ly/2UxXjqo.

2
MILITARY GEOGRAPHY OF IRAN'S MARITIME ZONES

To the north of Iran is the Caspian Sea; to its south are the Persian Gulf and Gulf of Oman, connected by the narrow Strait of Hormuz. Altogether, these bodies of water account for about 3,600 miles (5,800 km) of Iranian coastline. In addition, Iran has some 680 miles (1,095 km) of island coastline. This chapter offers some basic yet important facts about the geographical value of Iran's maritime zones.

PERSIAN GULF

The Persian Gulf is a "semi-enclosed sea" 615 miles (990 km) in length and between 40 and 210 miles (68–338 km) in width, covering an area of approximately 92,600 square miles (240,000 square km). Its average depth is 164 feet (50 m), with a maximum depth of 197–328 feet (60–100 m) at the entrance to the Strait of Hormuz (see map 1). Numerous coves and inlets on the Gulf's shoreline serve as small-boat harbors and anchorages, as do many breakwaters constructed throughout the coastal areas and Iran's seventeen islands.[1] Those islands form a natural barrier at the mouth of the Persian Gulf. (See maps 1a and 1b later in this chapter, as well as the "Grand Strategic Scheme" of the Gulf—map 3—at the end of this study.)

At the Gulf's northern end, the Tigris and Euphrates Rivers join to create the Shatt al-Arab waterway, which is 2,950 feet (900 m) wide and up to 98 feet (30 m) deep as it enters the Gulf. The section that forms the international border between Iraq and Iran, about 56 miles, is known in Iran as Arvand Rud, or the Arvand River.

According to the 1975 Algiers Accord between Iran and Iraq, the "thalweg"—the line tracing the deepest parts of a given waterway—is the accepted boundary between the two countries, although changes to the riverbanks and location of the thalweg in the mostly undredged Shatt al-Arab could mean that a fairly significant area in the northern Gulf falls within a gray zone—as demonstrated during the 2007 seizure of fifteen British sailors entering the waters.[2] Iran prohibits any foreign military activities and practices in its exclusive economic zone in the Persian Gulf.[3]

The Persian Gulf region holds 53.5 percent of the world's proven oil reserves and 39 percent of its proven gas reserves, according to OPEC data.[4] In 2017, Persian Gulf countries exported about 21.4 million barrels of crude oil and petroleum products per day and imported 0.94 mb/d of petroleum products (most of this by Iran) using supertankers sailing through the Strait of Hormuz. During this period, Qatar and the United Arab Emirates also exported 143.5 billion cubic meters of liquefied natural gas using the same route.[5]

As for the climate, the Persian Gulf summer, from May to October, is very hot and humid—with temperatures reaching up to 125 degrees Fahrenheit (52 Celsius), with 90 percent humidity in certain areas—making sustained small-boat operations in daytime almost impossible unless the boats are-air conditioned. Heat and high humidity also disrupt the performance of electronics and radars—particularly the type of small marine radars used on Iranian speedboats—by causing the "elevated evaporation duct" phenomenon. The winter weather is generally pleasant, although the early part of the season is often accompanied by heavy rains that can cause usually dry coastal riverbeds to flood, with devastating effects for locals. The region, overall, only enjoys between three and five months of temperate weather. The inhabitants of southern Iran who form a significant part of the Islamic Revolutionary Guard Corps Navy (IRGCN, aka Sepah Navy) and local Basij cadres can be expected to function better than foreign forces in the region's harsh conditions.

Seasonal storms and occasional sandstorms reduce visibility, making small-boat operations dangerous. This explains why annual weather cycles likely influence the

planning for, and timing of, Iranian small-boat operations. Early-morning fog, salt, haze, or dust, especially from May to August, reduces visibility to between two and six miles, and sometimes to as little as a half-mile.[6] Small-boat operations also occasionally benefit from the hydrographic characteristics of the mission area, such as a predominant counterclockwise current in the northern Persian Gulf, which converges with four other smaller currents. These currents offer convenient initiation points for launching small-boat attacks.

STRAIT OF HORMUZ

The narrow Strait of Hormuz, with its approaches, has a length of approximately 120 miles (193 km), a width at its eastern end of some 60 miles (97 km), at its western end of 24 miles (38.4 km), and an average depth of 164 feet (50 m). The Iranian side of the strait is dominated by Qeshm Island, with Hormuz and Larak Islands to its east, heralding the entrance to Bandar Abbas.

Astride the strait are Iran's Bandar Abbas seaport as well as a major spur of the national railway system. More than 40 percent of the world's internationally traded oil, between 17 and 20 million barrels, passes through the strait each day, carried by around fifteen tankers, three to four of which are very large crude carriers. All traffic is carefully watched by Iranian surveillance assets, including from the islands of Qeshm, Greater and Lesser Tunbs, and Faror, which together with the triad of Abu Musa, Bani Faror, and Sirri are strategically located near the navigation routes to and from the Persian Gulf.[7]

The strait's shipping channels lie on the Omani side and include a twenty-five-mile-long, two-mile-wide corridor used to enter the Persian Gulf. This route is separated from the deeper two-mile-wide outgoing corridor used by laden tankers by a two-mile-wide traffic separation zone. Such traffic separation schemes are governed by the International Maritime Organization (IMO), a specialized United Nations body. According to Cdre. Alireza Tangsiri, commander of the IRGCN, per a bilateral agreement with Oman, Iran monitors incoming traffic while the Omani navy monitors outgoing traffic.[8] No duly published evidence of an Iran-Oman agreement has emerged, however. Such an agreement is unlikely given that international maritime law only foresees cooperation in search-and-rescue operations (Article 98, UN Convention on the Law of the Sea; UNCLOS) or in scientific marine research, and concern over freedom of navigation in the Strait of Hormuz was one reason the Omani foreign minister visited Tehran on July 27, 2019, following Iran's seizure of a British tanker in Omani waters.[9]

Another IMO separation scheme, fifty miles long, is located just inside the Persian Gulf, most of it within Iranian territorial waters. This scheme regulates traffic in a pair of three-mile-wide corridors. The inward route runs totally within Iranian territorial waters, as does most of the outward route, which measures at least 200 feet (60 m) deep and runs across waters separating Tunb and Abu Musa islands. These two islands are some 25 nautical miles (46 km) apart, and the distances from Abu Musa to Sharjah (UAE) and from Tunbs to Ras al-Khaimah (UAE) are 34 and 43 nautical miles (about 63 km and 80 km), respectively.

This traffic separation zone is a potential point of contention, especially since right of transit passage still allows conduct of normal operations such as launching ship-borne helicopters or keeping submarines submerged. Another potential point of contention is Iran's apparent use of archipelagic-state status in the Persian Gulf, prompting it to claim waters between its islands that extend up to 24 nautical miles, beyond the common 12 nm demarcation, according to UNCLOS, as its territorial waters.[10] The United States considers this claim baseless under international law.[11]

The continental-shelf boundary between Iran and Oman effectively replaces the territorial sea in parts of the strait less than 24 nm in breadth, such as at Larak Island. The United States considers a coastal state's islands part of its land territory, citing Article 121 of UNCLOS. Iran, however, gives its islands, whether in or outside its territorial sea, their own 12 nm territorial sea (per Article 2 of a 1993 Iranian act on maritime navigation). Some of these territorial waters are themselves subject to dispute, creating further grounds for possible contention. Both Iran and the UAE claim sovereignty over the three islands of Abu Musa and Greater and Lesser Tunbs.

Since at least 2016, the IRGC has reserved the right to deny U.S. Navy vessels "innocent passage" at any time, arguing that the United States, as well as other Western coalition members, holds hostile intentions toward the Islamic Republic.[12] Cdre. Ali Fadavi, the former IRGCN commander, even claimed in 2016 that Iran had already denied "innocent passage" of naval vessels belonging to the United States, Britain, France, Canada, New Zealand, and Australia.[13] Although under Article 25 of UNCLOS a coastal state can temporarily suspend innocent passage in specific areas of its territorial sea for security reasons, such provision does not apply to international straits (par. 2 of Article 45) and should not be invoked in any discriminatory manner.

Meanwhile, even though the United States has not signed the UNCLOS and Congress has yet to ratify the convention, Washington considers the measure to reflect customary international law and exercises navigational rights and freedoms enshrined in it.[14] The latest attempt to ratify the UNCLOS was blocked by the Senate in July 2015. Opponents say they prefer unilateral U.S. shows of strength over

subjection to multinational conventions and regulatory bodies where the United States has no veto power. In the meantime, U.S. Navy leadership strongly supports joining the treaty, believing it would help preserve navigational rights, including innocent passage, for its fleet around the world, specifically in the Strait of Hormuz and especially within the territorial seas of coastal states that do not recognize U.S. naval supremacy or show interest in any reciprocal rights to sail through U.S. waters.

But Iran disputes the current U.S. claim to right of transit passage. Like other coastal states, it regards this as a contractual right granted to only those states party to the UNCLOS. When Iran signed the UNCLOS on December 10, 1982, it also submitted an "interpretative declaration" that "only states parties to the Law of the Sea Convention shall be entitled to benefit from the contractual rights, including the right of transit passage through international straits, created therein." Tehran, which itself is yet to ratify the convention, also demanded prior authorization for warships and submarines willing to exercise innocent passage through its territorial waters and reserved the right to deny them passage according to Iranian security interests.[15] In response, the United States has cited its agreement to a 1994 agreement relating to the implementation of Part XI of the UNCLOS, claiming this adherence affirms the right of transit passage as a codification of existing customs and established usage, making it irrevocable by the coastal states.[16]

Meanwhile, a deep and narrow alternative route bypassing the Strait of Hormuz, known as an "inshore traffic zone," runs between Oman's Quoin Island and Musandam Peninsula. Before the existing scheme took effect in 1982, inbound ships could navigate through this zone, which is well clear of Iran's territorial waters. This traffic traversed the high seas, skirting south of Abu Musa and the joint UAE-Iranian Mubarak oil field, where waters are at a depth of 100–130 feet (about 30–40 m). Yet despite IRGC claims that Western navies have often used this route since 2007—when geographical areas of responsibility were separated between the IRGC and Islamic Republic of Iran Navy (IRIN) and, as a result, the Guard formalized its self-declared "control" of the Persian Gulf and the Strait of Hormuz—the inshore channel has in fact seen very little international navigation since the late 1960s. Any passage has required special permission by Omani authorities. In accordance with the Convention on the International Regulations for Preventing Collisions at Sea (COLREGs), a transiting vessel cannot use an inshore traffic zone when it can safely use the appropriate traffic lane within an adjacent traffic separation scheme, except when it is less than 20 meters in length, is heading for a port or offshore installation within the inshore traffic zone, or is in any danger (Rule 10 of COLREGs).[17]

GULF OF OMAN (MAKRAN SEA)

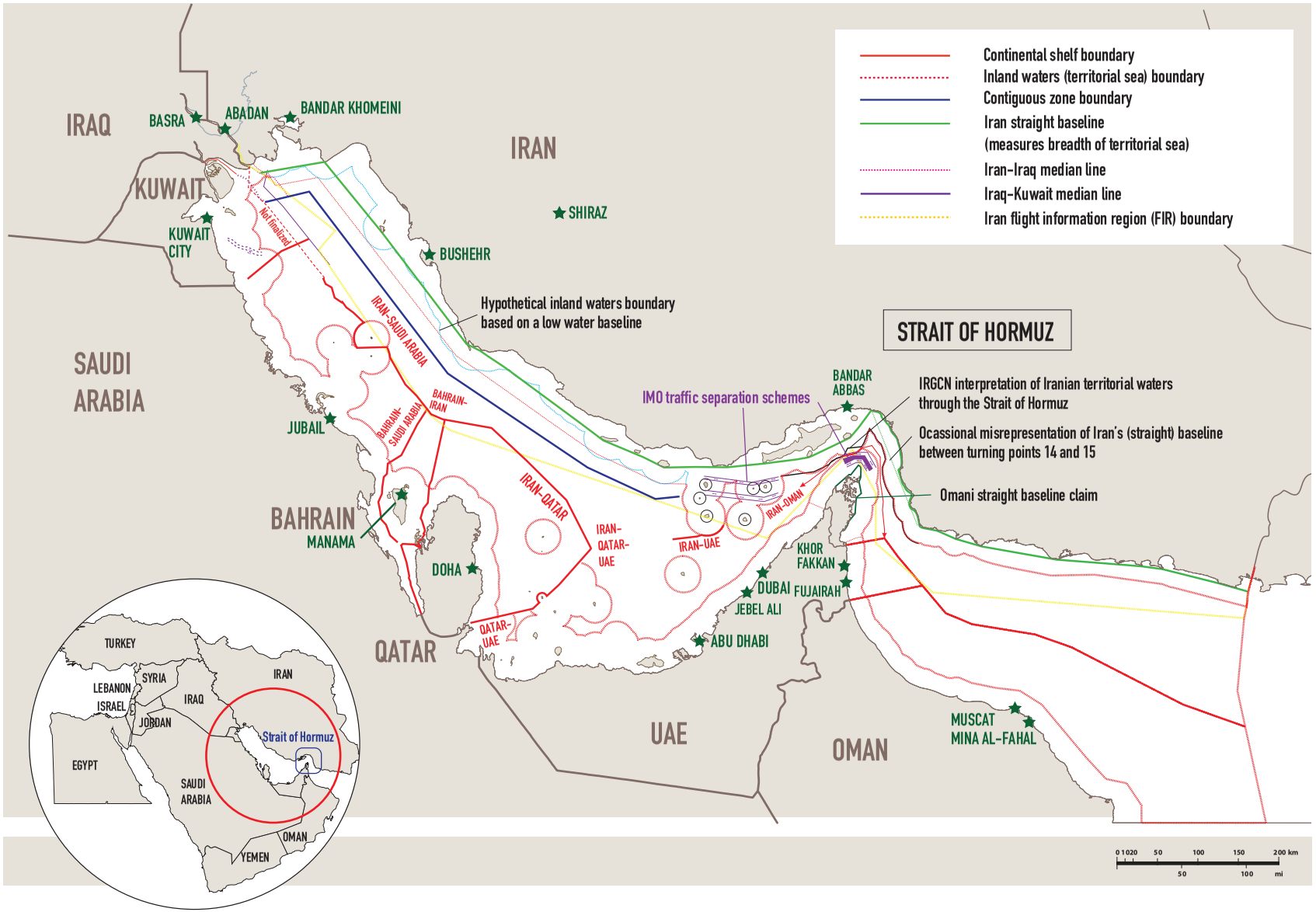
The Gulf of Oman, also known by its ancient Persian name, the Makran Sea, has an approximate length and width of 590 and 210 miles (950 and 340 km). It connects the Persian Gulf to the Arabian Sea—or, as Iran calls it, the "Northern Indian Ocean"—and Indian Ocean proper and is significantly deeper than the Persian Gulf, with a maximum depth of 11,100 feet (3,400 m).

Iran in recent years showed renewed interest in developing its Makran shoreline between the Strait of Hormuz and the Pakistani border—by planning or building coastal roads, breakwaters, infrastructure, and naval bases at Pasabandar, Sirik, Konarak, and Jask, and by expanding the Port of Chabahar, Iran's only deepwater open-sea port. In fact, in December 2017 Iran opened a $1 billion expansion of the Chabahar port, jointly funded by India, which reportedly more than tripled its annual total cargo throughput to 8.5 million tons. This extension bypasses Pakistan altogether for Indian exports to Afghanistan. Eventually, Chabahar is expected to reach a throughput capacity of 82 million tons, if all four planned phases are completed by the IRGC's Khatam al-Anbia construction branch as promised. In direct competition with Chabahar, Pakistan is developing the Port of Gwadar across its border with Iran, with significant Chinese partnership, envisioning a cargo throughput capacity of 400 million tons per year by 2045.

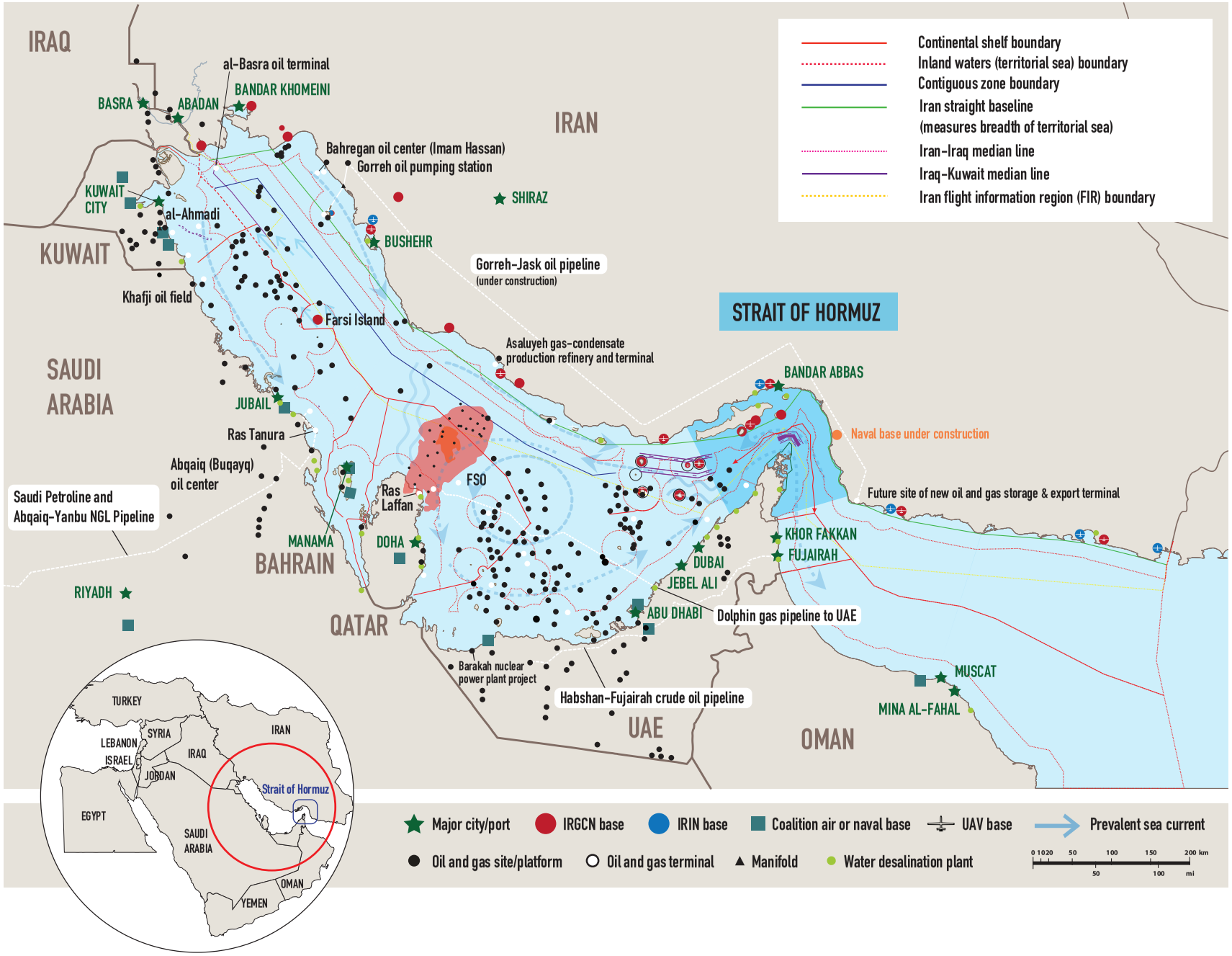
Iran is also very keen on finishing development of a $2 billion project to establish an oil export terminal 40 miles (65 km) west of Jask, just east of the strait. Construction of pipe components for a 680-mile (1,100 km) pipeline from the Gorreh pumping station north of Kharg to Jask is already under way. This project could eventually see up to 1 mb/d of light and heavy crude oil loaded onto supertankers on the coast near Jask using three single-point mooring units. The current government intends to make the priority project operational by 2021. Just as important is the planned 30-million-barrel storage tank farm in this region, which is intended as Iran's strategic reserve. It will bring Iranian oil closer to markets and could eventually be linked to the central Asian oil producers via a north–south pipeline under future swap programs. By reducing its dependence on exports from the Kharg terminals, currently at about 90 percent, Iran will also be able to exert more leverage over the flow of oil out of the Strait of Hormuz.

These ambitious plans to develop Makran's coastline into an economic/industrial powerhouse, however, could be undermined by a lack of investment. Transforming Makran into a full-fledged trade corridor for Afghanistan and central Asia will depend on substantial foreign investment in road and railroad, port and airport, and energy infrastructures, investment that has so far only trickled in from India.[18]

MAP 1A. PERSIAN GULF: MARITIME BORDERS AND DEMARCATIONS



MAP 1B. PERSIAN GULF: MARITIME BORDERS, DEMARCATIONS, AND PETROLEUM INFRASTRUCTURE



CASPIAN SEA

The Caspian Sea is the world's largest lake, covering 150,000 square miles (400,000 km) and measuring 748 by 199 miles (1,204 by 320 km). It has 3,976 miles (6,400 km) of coastline, of which more than 560 miles (900 km) belong to Iran. On average, the water depth is 82 feet (25 m) in the north, 2,582 feet (788 m) in the center, and 3,360 feet (1,025 m) in the south, along Iranian shores. Iran has three active Caspian ports, Anzali, Nowshahr, and Amirabad, the last of which has gained in importance both as a commercial and naval port in recent years.

With its vast oil and gas reserves, the Caspian enjoys a growing strategic status, but navigation to the open sea is only possible selectively through Russia's Volga–Don and Volga–Baltic complex systems of inland waterways and locks, which allow passage of vessels not exceeding 5,000 tons, a length of 460 feet (140 m), or a drought of 11.5 feet (3.5 m). The Russian Inland Waterways Act of 1936, enacted by Stalin and more or less still in effect today, forbade all foreign vessels from using Russian inland waterways, including the abovementioned canals. Citing this law, Russia rejected previous requests by Iran for passage of its naval vessels through the Volga waterway system, prompting Iran in 1996 to start building warships at the Shahid Tamjidi Shipyard in Anzali.

Seven years later, in 2003, Iran completed construction of its first modern-day naval vessel in the north, the *Paykan* (Arrow). This was followed by several more missile craft and a frigate—the 100-meter Mowj/Jamaran-class *Damavand,* commissioned in 2015. The *Damavand*, however, saw its end in January 2018, weeks after colliding with a breakwater during bad weather at Anzali harbor; some of its electronics and hull sections were salvaged. A replacement is currently under construction at Tamjidi (see table 1).

Facilitated by the pleasant Caspian climate, both Iranian navies have bases along its shores—in fact, as many as all the other Caspian nations' combined. The IRIN's fourth naval district is headquartered at Anzali, with two smaller bases at Astara to the west and Amirabad to the east. The IRGC also has a naval base not far from the Neka oil terminal. Most important of all are the two naval academies, where almost all the maritime training of the two organizations is concentrated.

Russia's invocation of its 1936 law isn't the only basis for conflict in the Caspian. In the late 1990s, tensions between Turkmenistan and Azerbaijan rose over rights to several offshore gas fields, as did unease between Azerbaijan and Iran. Indeed, the region has been increasingly militarized in recent years, with Moscow repeatedly making clear it would engage in war with any Caspian state if its interests were threatened.[19]

In 2017, Russia began construction of a new naval base at Kaspiysk in the Republic of Dagestan.[20] When completed in 2020, the base will replace Makhachkala and Astrakhan as the home of Russia's Caspian Flotilla. By the same year, the Caspian Fleet will reportedly have grown considerably, receiving some of the most modern warships in Russia's inventory.[21]

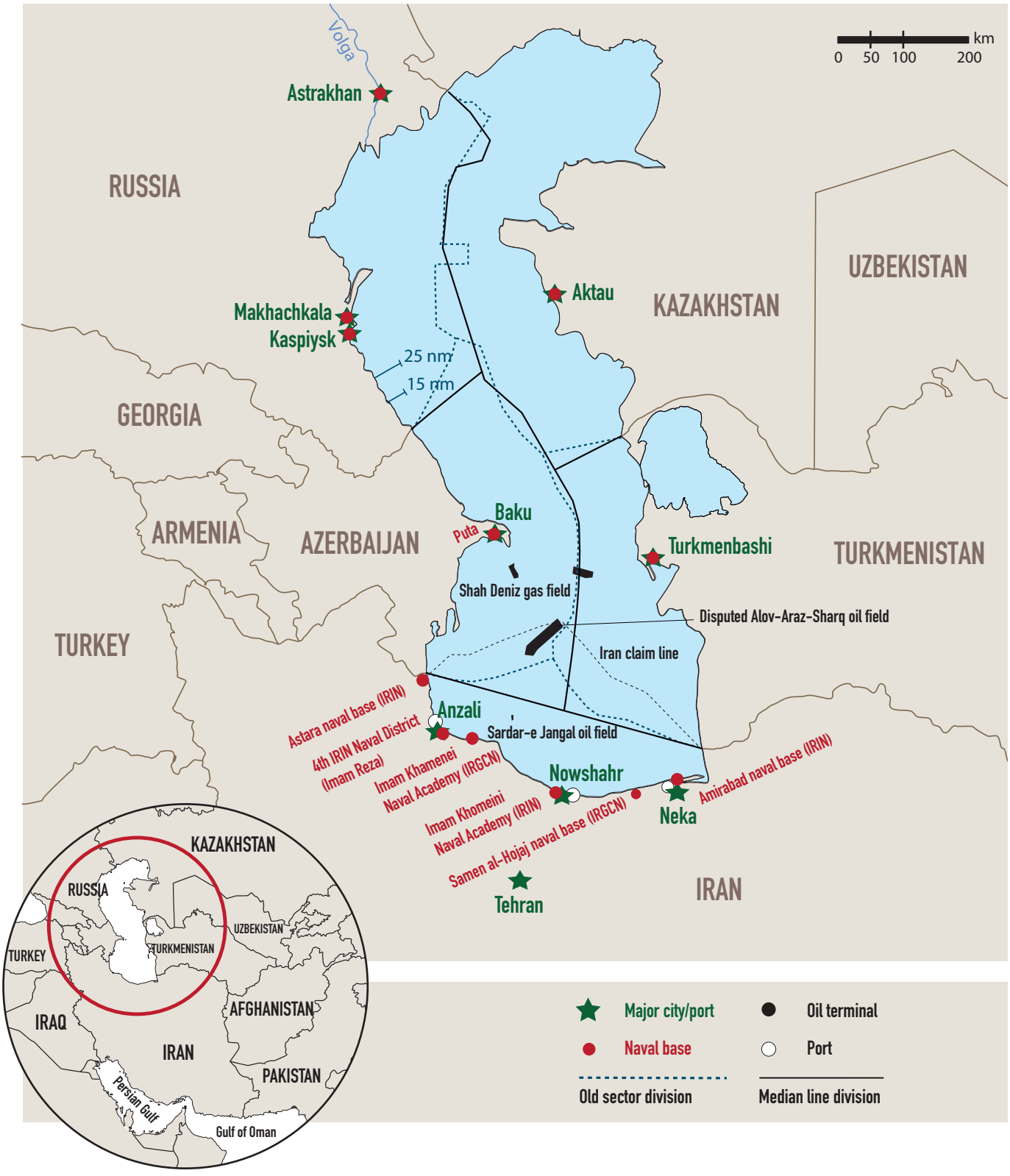
In 1998 and again in 2001, disputes over oil exploration rights by Iran and Azerbaijan centered on the Alov-Araz-Sharq oil field, near the former Soviet-Iran demarcation line. On July 23, 2001, this dispute nearly pushed Iran and Azerbaijan into a military confrontation. Russia supported Azerbaijan, and in return Azerbaijan agreed to temporarily divide its seabed with Russia along the median line and leave the surface for common use. Kazakhstan later joined this scheme.

TABLE 1. CASPIAN FLEET COMPARISON

	FRIGATE	CORVETTE	MISSILE BOAT	PATROL BOAT AND COASTAL COMBATANT	NAVAL HELICOPTER	MINESWEEPER	AMPHIBIOUS, LANDING SHIP, HOVERCRAFT
Russia	2	8	3	5	~60	5	11
Kazakhstan	-	-	2	22	-	1	-
Turkmenistan	-	-	2	17	-	-	-
Iran	-	1	4	10	1	1	-
Azerbaijan	-	1	-	10	3	4	6

Source: International Institute for Strategic Studies, *The Military Balance* 2018.

MAP 2. CASPIAN SEA



Iran has also felt threatened by close military relations between Azerbaijan and Israel. And both Russia and Iran have opposed the prospective Trans-Caspian Gas Pipeline, which would transport natural gas produced in Turkmenistan and Azerbaijan to Europe. On the military front, Russia has resisted Azerbaijan and Kazakhstan's efforts toward naval buildup, which prompted both to ultimately turn to the West for assistance. The first Kazakh-made warship was commissioned in 2012. Turkmenistan also underwent a major naval buildup in the first years of the same decade.[22]

Even as other causes of contention have emerged in the region, including pollution and depleting caviar stocks, offshore oil and gas resources have remained preeminent. Moreover, the depth of the Iranian side of the sea will make any oil and gas exploration costly and difficult, and economic activity in this area requires specialized technology and equipment, not to mention considerable investment.[23] Therefore, combined with the undetermined legal status of the Caspian, these factors have so far kept Iran largely inactive in the region's oil and gas sector, while several of its exploration zones are claimed by neighboring countries such as Azerbaijan.

Further, in August 2018, Russia, Iran, Kazakhstan, Turkmenistan, and Azerbaijan signed the Convention on the Legal Status of the Caspian Sea, establishing 15 nm territorial water followed by an additional 10 nm of exclusive fishing zone. This effectively cleared the difficult path for the five Caspian nations to negotiate delimitation of territorial waters, seabed, and resource exploitation zones on bilateral bases.[24] Therefore, Iran's share of the Caspian, which is not expected to exceed 12 percent at best, will be finalized at some point in the future.

The convention calls separately for maintaining the Caspian as a "zone of peace" with a "stable balance of armaments... and military capabilities within the limits of the *[sic]* reasonable sufficiency...to strengthen regional security and stability."[25] In addition, no country from outside the region will be allowed to deploy troops or establish military bases in the Caspian region. The convention finally ensures free access from the Caspian to other seas and back in accordance with international law and bilateral agreements, without applying any restrictions on military vessels (Article 3).

CIVILIAN SHIPPING

Amid these various trends, Iran planned to increase its market share in Caspian shipping from 35 percent in 2016 to 50 percent by the end of 2018, assuming Iranian businesses could bear rising fuel costs.[26] But the plan apparently failed, with market share actually falling by about 5 percent to 30 percent by summer 2018.[27] Iran currently operates more than twenty-four general cargo ships in the Caspian with a total capacity exceeding 96,000 tons. A subsidiary of the state-owned Islamic Republic of Iran Shipping Lines (IRISL), the Khazar Sea Shipping Lines, also intends to add oil tankers to its fleet in anticipation of expanded future oil works. According to Russia's TASS news agency, given increasing restrictions on shipment of Iranian oil via traditional routes, Russia-backed Crimean officials have offered Tehran port facilities, including along the Volga–Don canal, to transport its oil to markets on the Black Sea through the Kerch Strait.[28] This offer would appear, however, to come from Russia, since the Volga–Don canal system runs through Russia proper and not Crimea.

According to OPEC and official Iranian data, the Islamic Republic operates the largest tanker fleet among the OPEC countries, consisting of around fifty mostly supertankers with a total capacity of 14.3 million deadweight tons (DWT), plus one liquefied petroleum gas carrier.[29] The now pseudo-private National Iranian Tanker Company (NITC) also plans to purchase ten liquefied natural gas (LNG) carriers and twenty chemical tankers. But very low supertanker production rates have put those plans in doubt, and the reportedly free-on-board (FOB) nature of most current Iranian oil sales meant the NITC hauled a significantly smaller share of Iranian oil exports during the relief period—i.e., of U.S. participation in the JCPOA, 2016–18—compared to the previous 2012–16 period under sanctions. The return of U.S. oil sanctions in November 2018 to some degree reinvigorated Chinese demand for NITC-operated tankers to transport the oil imported in its monthlong journey from the Islamic Republic.[30] Iran also often uses its tanker fleet to store its unsold crude oil and condensates; according to industry figures, by late August 2019 floating Iranian oil volumes were close to 50 million barrels. This trend is expected to rise in both number and duration, which in turn will limit the NITC's export capacity.[31] Iranian tankers, meanwhile, receive on-demand protection from the Iranian navy against piracy in the Gulf of Oman and Arabian Sea down to the 10th parallel north.

Iran also operates 226 cargo ships and bulk carriers with a total capacity of 17.8 million DWT, of which 164 are owned by Iran, with 28 of these owned or chartered by the IRISL.[32] All nuclear-related U.S. sanctions against Iranian shipping lanes were reimposed on November 4, 2018.[33]

MARITIME BOUNDARIES AND THE QUESTION OF "INNOCENT" OR "TRANSIT" PASSAGE

As defined by the UNCLOS, the Persian Gulf is an "enclosed or semi-enclosed sea" connected to another sea or the

ocean by a narrow outlet.[34] In 1959 (and further endorsed in a 1993 law), Iran set its territorial waters at twelve miles from its baseline, including the area around its islands, with a contiguous zone extending a further twelve miles. This was a year after Iraq and Saudi Arabia had adopted a similar approach, followed by Kuwait (1967), Oman (1972), and Qatar and the UAE (1993). In 1965, Iran and Great Britain recognized the limits of Iran's territorial sea as the de facto maritime border between Iran and the Arab protectorates of Britain in the south. Later Iran finalized its maritime boundaries in the Persian Gulf and the Gulf of Oman on a bilateral basis with Saudi Arabia (1968), Qatar (1969), Bahrain (1971), and Oman (1974). Iran's maritime boundaries with Iraq, Kuwait, the UAE, and Pakistan, however, are yet to be delimited. Also, even though Iran and Oman delimited their maritime borders in the Strait of Hormuz in 1974, their borders in the Gulf of Oman are yet to be delimited. With regard to the Persian Gulf seabed, Iran recognizes the continental shelf beyond its territorial sea and considers the principle of the median line as the basis for its continental shelf in the Persian Gulf. But the narrow Gulf consists entirely of the territorial seas and exclusive economic zones (EEZs) of coastal states, necessitating bilateral agreements. This is the approach Gulf Arabs prefer, especially in areas with oil and gas prospects, and they avoid using the term "continental shelf" altogether.

While the UNCLOS recognizes exclusive resource rights within a coastal country's EEZ and the twelve-mile territorial waters and contiguous zones, it does not grant the right to restrict access to its EEZ.[35] This also applies to the right of transit passage through international straits, even if these encompass the territorial seas and national airspace of bordering states. This access cannot be suspended for any reason, unless passage threatens the "sovereignty, territorial integrity or political independence" of bordering states.[36] Iran's maritime boundaries with other countries prevent Tehran from claiming a maximum EEZ consisting of its littoral or continental shelf. Iran's EEZ ends at its maritime boundaries with neighboring countries.

Innocent passage was first introduced in the 1958 Geneva Convention on the Territorial Sea and Contiguous Zone, and transit passage through international straits was raised in the 1982 UNCLOS. Innocent passage applies to navigation through a country's territorial seas, or through an international strait that connects "a part of the high seas or an exclusive economic zone and the territorial sea of a foreign state." Passage is considered innocent as long as foreign vessels, to include warships, respect all the coastal state's safety regulations that conform to UNCLOS, and refrain from posing a threat to the coastal state. To clarify the latter requirement, UNCLOS introduced a list of activities that would be considered "prejudicial to the peace, good order, or security of the coastal state" if conducted inside respective territorial waters during innocent passage (Article 19). As noted, a state can temporarily suspend innocent passage in specific areas of its territorial seas for security reasons (Article 25), but this provision cannot be applied in a discriminatory fashion that singles out individual countries. More important still, it does not apply to international straits (Article 45), where the right of transit passage applies.

Transit passage, meanwhile, refers to continuous, expeditious navigation through straits that connect two areas of the high seas or the exclusive economic zones of two or more countries. The United States categorizes the Strait of Hormuz and its approaches as such. Accordingly, U.S. vessels regularly exercise the rules of transit passage when entering the Persian Gulf—although Washington regards this as well-established international practice rather than a contractual right granted under UNCLOS, to which the United States is not, as noted, a signatory.

As a matter of comparison, transit passage offers significantly greater navigation rights than innocent passage. Article 39 of UNCLOS describes how transiting ships are expected to avoid any threatening activity against "the sovereignty, territorial integrity, or political independence" of the coastal state, as determined by the UN Charter. Yet UNCLOS also explicitly declares that transit passage through an international strait "shall not be impeded" (Article 38) and that coastal states cannot suspend it for any purpose, including military exercises (Article 44).

As mentioned before, Iran never recognized the right of transit passage, and never ratified the UNCLOS after signing it in December 1982, or even the 1958 convention, therefore maintaining a de facto belligerent presence in the Persian Gulf and the strait.[37] Over 2019 especially, Iranian activity in the strait, including in Omani territorial waters, indicated expanded Iranian dominance over the entire waterway, further complicating the situation between the Islamic Republic and those maritime states attempting to exercise freedom of navigation in the Gulf region. As later parts of this monograph will discuss, Iran also does not recognize transit passage and restricts innocent passage through the strait, partly to single out specific nations, causing potential contention with states that insist on exercising their right to transit in international waters. In 1993, as alluded to earlier, the Iranian parliament passed its own legislation—called the Marine Areas Act—inking Iran's maritime jurisdictional claims.[38] The United States, for its part, argued that many of those claims did not conform to the UNCLOS. One major area of disagreement, according to a 1994 report from the U.S. Department of State, has been the issue of innocent passage.[39] The Iranian act interprets passage through the strait and Persian Gulf shipping routes only as innocent passage, and for the first time defines it as continuous and expeditious passage—except in cases of force majeure—of foreign vessels through its

territorial waters, "so long as it is not prejudicial to good order, peace and security of the Islamic Republic of Iran."

Those constraints, as defined in Article 6 of the 1993 Iranian act, include any threat against the territorial integrity and "political independence of the I. R. of Iran," its military exercises, military or economic intelligence gathering, propaganda, launching or recovery of aircraft or other military devices, loading and unloading, acts of environmental pollution, fishing, surveying, jamming, or any other activity "not having a direct bearing on passage."[40] The IRGCN correspondingly conducts surveillance and control missions to visually identify and occasionally harass Western naval assets, and it reserves the right to deny them freedom of navigation.

While the restrictions just set forth are largely consistent with international law, the Iranian act fails to recognize the Strait of Hormuz as an international strait, which would in turn allow transit passage. The United States identified a few areas as "objectionable constraints" on the right of innocent passage of warships and certain other vessels.[41] The 1993 act generally allows innocent passage under international law, but it does not make any reference to transit passage through the Strait of Hormuz.[42] Iran does not recognize any limitations on its right to suspend innocent passage, including the two limitations contained in international law: the temporary nature of any limitations and prepublication of the details. On numerous occasions while speaking on live television, Ali Fadavi announced blanket withdrawal of the right of innocent passage from "all Western naval vessels" transiting the strait, although these instances cannot be considered publication of an official communiqué. Only on October 5, 2016, did the IRGC issue an official communiqué withdrawing the right of innocent passage from "any vessel participating in the large-scale Gulf Shield 1 military exercise," which included more than twenty nations.[43] Iran also "broadly" reserved the right to adopt other regulations of its choosing to protect its "national interests" (Article 7), but the 1993 act did not mention whether they also included the Islamic Republic's strict revolutionary values, which often interchange or conflict with Iran's national interests.[44]

Under Article 9 of the 1993 act, Iran subjected the passage of warships, submarines, and nuclear-powered vessels to prior authorization. The United States openly objects to this condition on the basis of international law, and U.S. vessels have in the past exercised their right of "transit passage" through Iranian territorial waters while navigating the Strait of Hormuz without contacting Iranian authorities, especially large ships such as aircraft carriers. On numerous occasions since at least 2013, however, Fadavi has demanded that naval vessels traversing the strait submit themselves to IRGC radio interrogations in Persian.[45] According to the UNCLOS, transiting ships are required to comply with generally accepted international safety regulations and procedures, and to answer legitimate inquiries by coastal states while sailing through their territorial waters. The IMO's Maritime Safety Committee requires English to be used for maritime navigational purposes. Meanwhile, under Article 30 of the UNCLOS, a transiting warship shall comply with the laws and regulations of the coastal state.

Under its 1993 law, Iran also reserved the right to investigate, conduct hot pursuit of, prosecute, and punish any crimes committed by foreign vessels, including naval vessels, while engaged in innocent passage through its territorial sea (Article 11) or contiguous zone, defined as a further twelve-mile "zone of marine supervision" (Article 13). The terms spelled out in Article 11 were particularly troubling to the United States on international legal grounds, as later realized during the seizure of U.S. sailors in early 2016.[46] More than three years thereafter, on July 19, 2019, Iran's Revolutionary Guard special forces seized the British-flagged, Swedish-owned tanker *Stena Impero* in Omani territorial waters of the strait's international shipping corridor. Iran put forward a variety of reasons for its move, but they all came down to "reciprocal action" in response to the earlier British/Gibraltar temporary seizure of the Iranian supertanker *Grace 1* (later renamed *Adrian Darya 1*). This was carried out in Gibraltar waters on the correct suspicion that the tanker was transporting light crude oil—2.1 million barrels, as it turned out—for Syria's Baniyas refinery, which was under European Union sanctions.

Other U.S. objections include that to Iran's de facto establishment of a "security zone" in peacetime in its contiguous zone (Article 13) with the aim of restricting both navigation and overflights and having "expansive applications" that suggest potential further restricting effects.[47]

In addition to the earlier-mentioned restrictions on foreign marine navigation, Iran reserves the exclusive right to create artificial islands and offshore installations, as well as lay cables and pipelines protected by relevant safety and security zones, within its EEZ (Article 14). The United States, by contrast, does not recognize Iran's declared right to form any "security zones" around those installations, or its claim of exclusivity for laying submarine pipelines or cables in the EEZ. Washington maintains instead that Article 58(1) of the UNCLOS gives equivalent status to EEZs and the high seas, including freedom of navigation, overflight, and pipe laying, an interpretation clearly not shared by Iran.

Further, in reference to Article 56 of the UNCLOS, the United States has indicated that it does not recognize Iran's declared jurisdiction over dual-purpose activities such as hydrographic surveying and commercial prospecting within its EEZ or continental shelf.[48] This could be a potential area of conflict if Iran restricts any such activities by

labeling them marine scientific research, thereby allowing regime claims of control over relevant waters under both international and national laws.

The United States especially opposes Article 16 of the 1993 maritime boundary law, which prohibits military activities, intelligence collection, and any other endeavor inconsistent with the interests of the Islamic Republic within its EEZ or continental shelf.[49] In the State Department's view, this provision effectively turns Iran's entire EEZ into a security zone, which restricts freedom of navigation and overflights. While on several past occasions Iran has turned a blind eye to coalition minesweeping operations in the aforementioned areas, it usually remains watchful over its EEZ.

NOTES

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4 Annual Statistical Bulletin 2018, Organization of the Petroleum Exporting Countries (Vienna: OPEC, 2018), https://www.opec.org/opec_web/en/publications/202.htm.

5 Ibid.

6 Rouhollah K. Ramazani, *The Persian Gulf and the Strait of Hormuz* (Alphen aan den Rijn, Netherlands: Sijthoff & Noordhoff, 1979), 4.

7 Ibid., 2; and Hugh F. Lynch, "Freedom of Navigation in the Persian Gulf and the Strait of Hormuz," in *Security Flagships: Oil, Islands, Sea Access and Military Confrontation*, ed. Myron H. Nordquist and John Norton Moore (The Hague: Martinus Nijhoff, 1998), 317.

8 Tasnim News Agency, interview with Cmdr. Alireza Tangsiri, February 25, 2019, https://tn.ai/1955631.

9 Reuters, "Oman's Top Diplomat in Iran Talks amid Mounting Gulf Tensions," July 27, 2019, https://www.reuters.com/article/us-mideast-iran-oman/omans-top-diplomat-in-iran-talks-amid-mounting-gulf-tensions-idUSKCN1UM088.

10 Mohammad-Hossein Afshordi (Bagheri), "A Comparative Study of the I. R. of Iran Law of Maritime Areas in the Persian Gulf and the Sea of Oman and the Law of the Sea Convention" (in Persian), *Iranian Geographical Research Quarterly* 39, no. 59 (Spring 2007): 146, http://bit.ly/2Hf2hWj. In his article, Bagheri implicitly suggests that Iran has adopted an ad hoc archipelagic status in the Persian Gulf, by drawing a straight archipelagic baseline between Abu Musa and Sirri, which stand apart just over twenty-four nautical miles—the maximum distance between two islands for them to be considered the outer limits of internal waters under Iran's own 1993 maritime law (available at https://www.pmo.ir/pso_content/media/law/635996883336554930.pdf). Therefore, Iran seems to quietly treat entire waters between its Tunbs, Faror, Bani Faror, Sirri, and Abu Musa islands, which incidentally include two heavily used International Maritime Organization navigation corridors, as its internal waters. This was called—quoting Iranian researcher of maritime law and career naval officer Ali-Asghar Kazemi—"a special method of exercising sovereignty," ostensibly to prevent "exploitation by foreign naval vessels." Bagheri cautions that such action is against the UNCLOS and could interfere with international navigation through the Persian Gulf. The future chairman of Iran's general staff then reminds the reader that part 2 of Article 8 of UNCLOS still guarantees the right of innocent passage even under such circumstances. Based on Article 47 of UNCLOS, archipelagic states should give due publicity to their baselines and publish charts and coordinates accordingly, something Iran has not done in relation to the above discrepancy. For more on the discrepancy, see Reza Allahverdizadeh and Mohammad-Reza Hafezniya, "A Comparative Study of Iran's Maritime Boundaries in the Persian Gulf and the Sea of Oman with the UNCLOS" (in Persian), *Iranian Geographical Research Quarterly* 30, no. 4 (Winter 2016): 44–45, http://georesearch.ir/article-1-85-fa.pdf, and Fariborz Ahmadi Dahka, "A Geopolitical Analysis of the I. R. of Iran Sovereignty in the Persian Gulf and the Strait of Hormuz" (in Persian), 'Sarzamin': *Quarterly Geographical Journal of Territory* 10, no. 40 (Winter 2013): 74, http://bit.ly/2TEYzLp.

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16 For details of the 1994 agreement, see https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXI-6-a&chapter=21&clang=_en#6.
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23 Bahman Aghai Diba, "Iran's National Interests in the Caspian Sea," Times of Central Asia, March 19, 2006, available at http://www.payvand.com/news/09/sep/1102.html.
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42 Ibid., 24.
43 "Saudi Maneuvers in the Gulf and Iran's Decisive Warning" (in Persian), Tabnak, October 5, 2016, http://bit.ly/2F01Lb5. The IRGC's reaction to the Saudi drills, which were similar in scale and scope to many Iranian naval drills, was fierce.
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3
HISTORICAL BACKGROUND

Iran has a rich maritime heritage.[1] In ancient times, Persian fleets sailed as far west as Greece and as far east as China to conquer land or engage in trade. In the Mediterranean Sea, the Achaemenids used small warships and also spy ships disguised as foreign merchantmen to carry out clandestine operations,[2] and it was the ancient Persians, during the reign of Xerxes, who invented the concept of naval infantry.[3] Later dynasties built large cities and ports on the southern coasts of Persia, making those bodies of water the facilitators of trade between west and east.

Those glorious seafaring days were followed by centuries of decline. But Persia's aspirations were reawakened during the reign of Nader Shah (1736–47), when the country gradually built up a small fleet in the Persian Gulf, used early on, in 1736, to retake its previous territory of Bahrain. This success led the shah to create a coastal navy in the Persian Gulf. Persia then made expeditions to Oman in a bid to take control of the strategic Strait of Hormuz. To avoid emboldening this rising empire, Western powers refused to sell ships to Persia, and Nader ultimately decided an East India Company offer to build vessels for his navy was too expensive. So the Persian leader created an indigenous shipbuilding industry whose products were instrumental in bringing Oman to submission, as well as in fighting pirates. But this nascent Persian navy was short-lived, and by 1743 almost nothing was left of it.[4]

Between the early sixteenth and mid-nineteenth centuries, the Portuguese, Dutch, Ottomans, and British fought many battles for control of Persian Gulf ports, islands, and trade routes. This sparked corresponding wars of liberation enacted by southern Persians against foreign occupiers, the most famous led by Rais Ali Delvari in the early twentieth century against the British invasion of Bushehr. More recently, during the Pahlavi era, in the 1960s and 1970s, Iran embarked on a major naval expansion by purchasing large numbers of warships, naval helicopters, hovercraft, and submarines—though some were not delivered before the 1979 Islamic Revolution—and by building extensive naval bases at Bandar Abbas and Bushehr.

During the reign of Muhammad Reza Shah (1941–79), the Iranian navy was tailored principally to protect the Persian Gulf sea lanes and Iranian littorals and islands. But in his later years in power, the shah was also planning to create a blue-water navy by building a massive base at Chabahar, on the Gulf of Oman, ordering modern destroyers and submarines, considering the purchase of small aircraft carriers, and assuming a leading role in NATO's naval control of shipping patrols in the Middle East and western Indian Ocean.[5] To fulfill those missions, Iran expanded its navy from 6,000 personnel in 1965 to 28,000 in 1978,[6] and naval cadets were sent to the United States and Europe for training. The massive and hasty buildup, however, engendered various problems, including some domestic resentment directed at Iran's dependence on foreign support, organizational inefficiencies, problems with equipment operability, lack of preparedness for major combat operations, and heavy reliance on inappropriate conventional foreign military concepts and doctrines.

ISLAMIC REVOLUTION AND WAR WITH IRAQ

The 1979 revolution brought about major changes in Iranian strategic planning and political culture. Arms procurement contracts were canceled, and the new leadership carried out a series of military purges that affected the national navy. Although limited compared to actions targeting other military services, these steps still deprived the navy of many trained officers. The purges were joined by a new security enforcer, the Islamic Revolutionary Guard Corps (IRGC; in Persian, *Sepah-e Pasdaran-e Enghelab-e Eslami*—or just *Sepah* or *Pasdaran*).

From the beginning, the IRGC defined itself by ideologically driven unconventional thinking and the mass mobilization of Shia youth. This approach later developed into doctrines of "nonconservative" (anti–status quo) guardianship of the revolution, unremitting jihad, and a culture of martyrdom, all adaptable to changing planning and operational needs. The Sepah was soon to become the foremost advocate for

and practitioner of Iran's concept of asymmetric warfare, to include fighting at sea.

The Iran-Iraq War, which started in September 1980, included an active maritime dimension from the very start, with Iraq using torpedo and missile boats and naval helicopters to attack Iranian merchant ships and mine Iran's northern Persian Gulf harbors. But Iraq's naval capability took a hit in November 1980 when Iran's navy and air force launched a combined air and sea operation that sank and damaged several of its foe's naval vessels. Yet Iraqi shore-, helicopter-, and sea-based missile attacks continued against Iran's only commercial port at that time, Bandar Shahpour (later renamed Bandar Khomeini), the Kharg oil terminal, as well as offshore oil facilities. By late 1983, Iraqis began to obtain new antishipping weaponry and training, which allowed them to increase their maritime attacks by early 1984 and start targeting Iran-flagged oil tankers and tankers traveling to and from the Islamic Republic. This campaign and the Iranian response became known as the Tanker War. In it, Iran retaliated by deploying its conventional air and naval assets, but the Islamic Republic of Iran Navy also used its special-boat service commando (Takavar) unit to employ unconventional surveillance and raiding tactics, such as using dhows (for intelligence gathering), carrying out raids, and planting mines from small boats deep in hostile waters. These tactics were later adopted by the IRGC, whose quasi-naval role started during its 1984 Kheibar amphibious/riverine offensives in southern Iraq. The IRGC made extensive use of cheap and often poorly built fiberglass boats, sourced from contractors throughout Iran, to transport troops and supplies across marshlands.[7]

As early as March 1984, the U.S. intelligence community expressed grave concern about the possibility of a persistent and determined Iranian ability to threaten Gulf Arab oil shipping, despite a U.S. military presence. The main concern, based on available intelligence, was "unconventional attacks" in the Strait of Hormuz using kamikaze tactics by motorboats or small aircraft loaded with explosives, and other yet-unknown techniques, against which only greater tanker-convoy and heavy-warship deployment could defend.[8]

The IRGCN was established in September 1985 as an independent service under the command of Hossein Alaei. It soon assumed a key operational role during the seizure of Iraq's al-Faw Peninsula in February 1986, when a fleet of barges and fiberglass boats was deployed to transport troops and supplies across the Shatt al-Arab waterway.[9] Only after September 1986, however, did the IRGCN take part in combat operations in the Persian Gulf. That month, the Pasdaran briefly seized one of the two derelict Iraqi offshore oil terminals used as intelligence-gathering outposts in the northernmost corner of the Persian Gulf, but the force failed to establish a permanent presence there. This operation set the basis for later swarming attempts against Gulf shipping.[10]

Throughout 1986 and early 1987, Iraq intensified its economic warfare by targeting Iran's oil industry and increasing pressure on tankers carrying Iranian oil, as it faced more Iranian border offensives. Iranian leaders sought to increase the impact of their retaliation by hitting oil tankers related specifically to Kuwait and Saudi Arabia—the main financial backers of Iraq.

RULES OF ENGAGEMENT

Iran's rules of engagement during the Tanker War period were characterized by an odd combination of strict supervisory control from clerical leadership and certain degrees of initiative relegated to trusted field commanders. During the initial period, between February and December 1984, patrolling IRIN vessels or aircraft, after locating a potential target, would send a priority request for instructions up the chain of command. If the potential target was positively identified among those preselected by the National Defense Council (NDC; forerunner of the current Supreme National Security Council), Iranian units would be authorized to intercept it. If the request resulted in a "not listed" designation, indicating a ship not previously identified, the vessel was allowed to proceed while the Iranian unit waited for instructions from the NDC.

In conducting its reviews from Tehran, the NDC sought information on inbound ships such as their nationality, cargo, size, estimated time of arrival to the Gulf, and final destination. Resources in attaining this information included the Iranian port and shipping authorities, diplomatic missions abroad, representatives from the IRGC (specifically, from its Intelligence Organization and Qods Force), and personnel in friendly governments and other groups. Upon receiving the necessary information, the NDC forwarded it to naval headquarters to be acted on. Around the target's estimated arrival time, Iranian vessels or aircraft sought it out in the Gulf of Oman to confirm its presence and report specifics to fleet headquarters in Bandar Abbas, where officials then passed the findings to IRIN headquarters in Tehran. The NDC also determined which ships should be boarded and searched and which should be attacked. Laden tankers leaving Gulf terminals received monitoring priority from Iranian units, radars, and other intelligence assets. This information was sent along to the NDC, which designated particular ships for targeting and ordered the regional headquarters in Bandar Abbas to conduct joint air and naval attacks. The chain of command for the Iranian air force was similar, and when either the Bandar Abbas or Bushehr air base received a

"frag" (fragmentary) order, it sent out F-4E fighter-bombers armed with Maverick television-guided missiles or gravity bombs and escorted by air-to-air missile-armed Phantoms or F-14 Tomcats to classified special missions. Those special missions usually involved visually identifying targets, often laden tankers, before attacking them with missiles or bombs.

During this period, the IRIN was ordered to avoid U.S., Soviet, British, French, and Chinese merchant ships, but this restriction did not apply to the IRGC's naval branch, which assumed operational duties later during the Tanker War. When the ruling clerics or NDC ordered a retaliatory attack, the IRGCN, with its different rules of engagement, usually conducted a direct strike, which could include U.S.-flagged vessels. These attacks against foreign shipping were not usually coordinated with the IRIN, often leaving the national navy with no choice but to support the IRGC, despite the risk of sustaining significant casualties and being dragged into provocative naval action. Western intelligence services suspected that the IRGC even tried, in many cases, to lure the IRIN into a conflict with foreign navies in the Persian Gulf.[11]

The Tanker War dragged on for many more months, and following the first firing of an Iranian HY-2G Seersucker (aka Silkworm) missile targeting an Iraqi offshore target near Kuwait on December 14, 1986, Kuwaiti leaders, fearing further escalation, officially requested that both superpowers protect their tankers by "reflagging" several of them on January 13, 1987. Iran's leader, Ayatollah Ruhollah Khomeini, particularly disliked this development, which guaranteed increasing U.S. involvement at a time when the ground war itself had reached a stalemate.

After the reflagging, the Iranian leadership ordered the IRGCN to take over retaliatory strikes from the IRIN, as well as to face off against the U.S. Navy in what Iran called the "Second Tanker War." Soon after, on March 21, 1987, the IRGC started employing small speedboats aggressively using machine guns and rocket launchers. Hardly suited for extreme seafaring conditions, these boats were nevertheless cheap, fast, and easy to launch and recover. To this day, small, quick, and affordable platforms have remained the staples of the IRGCN.

The IRGC, however, still faced a vastly superior military force, and chose to compensate for its lack of equipment and experience with unconventional naval guerrilla tactics. This entailed part improvisation and part imitation of other countries' experiences, as well as reliance on deniability and the cover of night. The miniscule and uninhabited Farsi Island, conveniently located only a few miles from major shipping lanes passing to its north, became a hub of small-boat operations in the northern Gulf. Movement of supertankers was limited to deepwater shipping channels just north of Farsi, and only smaller tankers with a shallower draft could afford to keep clear of those routes.

Iran used various means to determine the identity of targets, including a small radar station on the island with a range of 15 nm. Once ascertained, the identity was relayed to the "Retaliation Surface Combat Group" (*Naav Gorooh-e Moghabeleh be-Mesl*), which dispatched several armed boats to approach the target at 35 knots and film and photograph its transom name and flag to confirm its identity. With the identity confirmed, two boats, each carrying twenty-four rockets, would be tasked with attacking it at 5 nm; they would take turns ripple-firing twelve MLRS 107-millimeter rockets at the tanker's engine room and waterline, plus several rocket-propelled grenade (RPG) rounds at the superstructure and radar mast, before turning back to reload once and then return. Upon completing an attack on their target, the boats would quickly head back for Farsi under radio and emission silence. Several boats were also equipped with 48-nm-range radars and night vision equipment for better target detection.

The IRGC also formed the 26th Salman Missile Brigade in Abadan to attack Kuwait from the Iran-occupied al-Faw Peninsula, and the 16th Assef Missile Brigade to threaten the Strait of Hormuz, made possible by the use of Chinese-made Silkworm missiles newly acquired from China and North Korea.[12] The first missile attacks against Kuwaiti territory occurred in January 1987. According to IRGC sources, from then until the end of the war in 1988, the Pasdaran fired eighteen antishipping missiles, mostly at Kuwaiti ports, terminals, and tankers. The majority of those missiles, however, either missed their targets or were decoyed successfully, and only three hit the mark.

Besides some setbacks, including the aborted swarming attack in October 1987 against Saudi Arabia's Khafji oil field, the world's largest offshore oil field, the IRGCN quickly built up its 1987 attacks on often carefully identified oil tankers carrying Kuwaiti and Saudi oil to a tally exceeding ninety-six, up from thirty-seven during the first year of the Tanker War—when the national navy was in charge of retaliatory attacks. The maritime domain was gradually overshadowing but hardly affected the stalled land war.[13]

During this period, Iran engaged in both retaliatory attacks and offensive minelaying. The former, and to some degree the latter, were proportional and carefully vetted from Tehran. This period also saw Iranian forces focusing their rocket attacks on low-risk large crude oil tankers rather than well-defended warships. During this phase, Iran was more successful in striking static targets than moving ones, an example being Silkworm attacks on Kuwaiti oil facilities and moored tankers.[14]

MINELAYING OPERATIONS

For minelaying of the northern Persian Gulf, the IRGC used Farsi Island and the Forouzan offshore oil platform as staging and intelligence posts, while the national navy was charged with mining areas closer to the Strait of Hormuz, including the UAE's Khor Fakkan, in the Gulf of Oman. The two forces never coordinated their operations, however, as is the case to this day. The Pasdaran used up to ten large Valfajr boats, each carrying between six and ten half-ton mines, to mine tanker lanes north of the island, while smaller boats carried one to three mines for more-clandestine missions. The regular navy used tugboats and supply ships with mines hidden under trampolines on the deck. There were reportedly early hesitations over whether to entrust the IRGC, seen as radical, with the role, and the defense industries producing mines initially refused to deliver them to the Pasdaran.[15]

The very first minelaying occurred on April 1, 1987, when the IRGC attempted to block the entrance to the Kuwaiti port of al-Ahmadi. These efforts were repeated elsewhere in the Gulf in the following days.[16] On May 8, Khamenei warned the Soviets against reflagging and escorting any Kuwaiti tanker, and on the same evening an overenthusiastic IRGC boat crew attacked a Russian ship on its own initiative, forcing an official denial by the Iranian Foreign Ministry. An angry President Ali Khamenei ordered the culprits to be summoned to Tehran and punished, but instead they were awarded for their action, and their superiors were told only to coordinate future attacks with Tehran.[17]

The next mining occurred July 1, 1987, when the Iranian navy planted sixteen mines in the Khor Fakkan anchorage area just outside the strait, covering an area of more than 3,000 square kilometers, while IRGC boats planted their mines later within a smaller area of central Gulf waters on the well-publicized path of the first reflagged convoy to enter the Persian Gulf in late July. This entry marked the start of Operation Earnest Will, an expanded U.S. military role in the region that included reflagging of eleven Kuwaiti tankers so that the U.S. Navy could legally protect them.

One of the tankers in the convoy, the empty crude carrier SS *Bridgeton*, struck an Iranian mine west of Farsi on the early morning of July 24 and suffered some damage but managed to continue sailing under its own power. The convoy had not received any particular warning of mine threats. Thereafter, U.S. intelligence sources apparently did not analyze communication intelligence related to the Khor Fakkan minelaying until August 8,[18] too late to stop the first mine strike in that area two days later—when the casualty was, ironically, a U.S.-owned tanker carrying Iranian crude oil.

The reflagging and the subsequent *Bridgeton* incident marked a turning point as well as a major escalation for the IRGC in its low-intensity confrontation with the United States in the Persian Gulf. The Khor Fakkan mining, apparently an Iranian attempt to severely restrict navigation through the strait, prompted an international mine countermeasure effort in the region. The Pasdaran escalation carried other risks for Tehran. Despite being ordered directly by Ayatollah Khomeini, the increased activity came amid already-exhausted capabilities and resources for the IRGC.[19]

On several occasions, U.S. warships seemed to be the intended targets. And this suspicion comported with a changed Iranian policy in mid-1987, which allowed targeting to include U.S. warships and helicopters under specific circumstances. In line with this shift, then IRGC ground forces commander Ali Shamkhani publicly promised on June 14 to build up the IRGCN using captured American warships. Quite a bit more plausibly, Iran's strategic objective at the time was to hit both Western and Soviet interests in the most sensitive situations.[20] Yet another such attempt failed on the evening of September 21, when an Iranian navy landing craft, *Iran Ajr*, was caught red-handed planting sixteen mines in a relatively shallow anchorage near Bahrain.

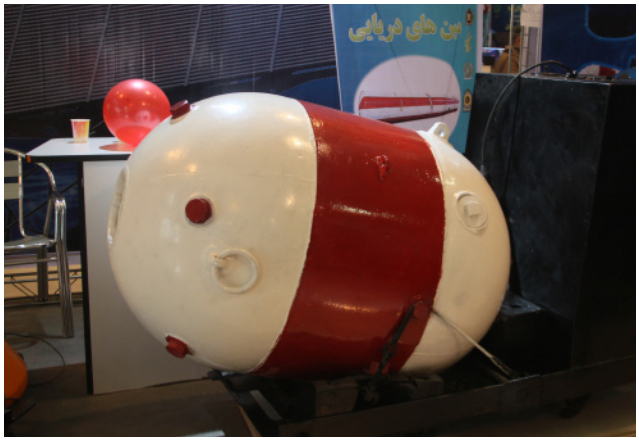
Into the fall and winter months, small-boat attacks against tankers continued, but confrontation with military targets remained costly. Despite the apparent zeal underlying it, a "helicopter ambush" mission on the night of October 8 went especially awry, when the U.S. Army Special Operations helicopters targeted for ambush fired first and sank two Iranian speedboats, killing at least five Guardsmen. This setback effectively dismantled the entire Bushehr battle group, as it was known, and northern Gulf operations.[21] This trend continued, and toward the latter stages of the war, the U.S. military and even the Iraqi air force became increasingly adept at detecting and destroying IRGCN boats.

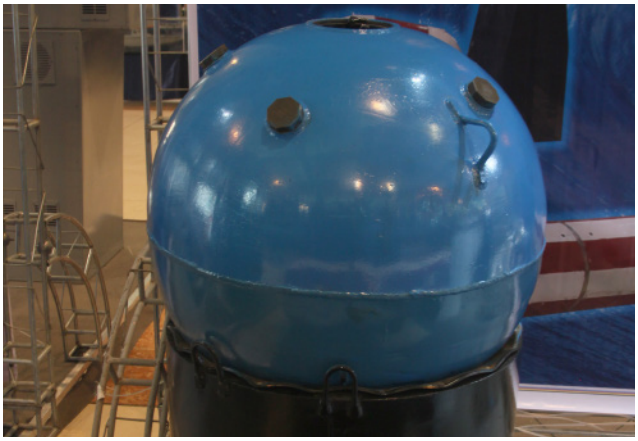
Eventually, though, persistent Iranian minelaying caught a U.S. warship. On the afternoon of April 14, 1988, the frigate USS *Samuel B. Roberts* struck an Iranian mine on the main eastbound shipping channel in the central Persian Gulf and suffered substantial damage. President Ronald Reagan promised retaliation, and on the morning of April 18, American warships stood poised to attack two Iranian oil platforms identified as staging points for minelaying missions.

According to an informed source speaking to the author, a warning of the attack had been submitted to Iran the prior night through the Swiss embassy in Tehran, but for some

FIGURE 1. EXAMPLES OF IRANIAN SEA MINES

Mooring mines





Bottom-laying mine

Images provided by the author.

reason it was not passed on to the oilmen occupying the platforms. So when evacuation warnings were transmitted by U.S. warships in the morning, the Iranian occupants were caught by surprise. The patrolling IRIN missile boat *Joshan* was ordered, despite having a nonfunctioning weapons system, to change course to secure evacuation of the platforms.

The resulting confrontation culminated in a major naval battle that the U.S. Navy called Operation Praying Mantis and Iran retrospectively referred to as "Reshadat" (Valor). During the battle, several IRGC speedboats, three Iranian warships (including *Joshan*), and three oil platforms were sunk or damaged, and U.S. forces lost a helicopter gunship. Iranian gunboats also attacked the Mubarak (Sharjah) offshore oil field along with several service vessels and a fuel-storage tanker. The Iranian willingness to risk its naval assets by ordering them to confront a vastly superior power with clear escalation dominance caught the Americans by surprise.[22]

The net impact of the IRGCN minelaying and gunboat attacks, which gradually became ends in themselves with no clear objective, was to energize a broader international involvement in opposing Iranian actions, at a heavy cost to Iran's interests. Meanwhile, IRGCN operations never deterred Iraq from conducting its Tanker War operations and hardly affected Gulf Arab oil exports, or those of Iraq, which for years had ceased using the Persian Gulf to export its oil; instead, Iraq used new land pipelines via Saudi Arabia and Turkey to carry essentially all its oil exports.[23] In the end, Iraq benefited from the escalation, which pulled Western powers into the conflict. As a result, the IRGCN's actions in the Gulf between 1987 and 1988 hardly served any long-term Iranian interest or strategic purpose, whether in the context of the Iran-Iraq War or outside it. These actions merely served to demonstrate the IRGC's revolutionary fervor and obedience, and solidified its frontline role, which it holds to this day, in resisting the "Great Satan." Furthermore, the maritime confrontation was a major factor in the U.S. decision to increase its presence in the Persian Gulf as well as to share intelligence with the Iraqis, which substantially helped turn the tide of war in favor of Baghdad.[24] The rudimentary Iranian gunboat attacks also failed to put out of commission any of their targets, an unsurprising outcome given the resilience of large tankers.

POSTWAR PERIOD

By the end of the Iran-Iraq War, despite its mixed and questionable performance, the IRGC had managed to convince most of the political leadership in Tehran of its commendable record in controlling shipping lanes, interdicting enemy maritime movements, and targeting coastal facilities using armed boats, shore-based missile batteries, and mines without the help of the national navy. The reality, however, was that this performance failed, to any significant degree, to impede other countries' oil shipments, or to inflict appreciable damage on their coastal facilities, and the psychological effect on oil markets faded with time. Moreover, the IRGC's actions drew greater superpower involvement in the region and diverted substantial resources from the main war effort with Iraq. To address its shortcomings, the IRGCN began developing or obtaining purpose-built equipment to execute its assigned missions more effectively.

NAVAL HARDWARE

Since the turn of the millennium, the Iranian national navy has gradually expanded its area of operation to the open seas, first by creating an industrial basis for building frigate-sized vessels, and then by maintaining a rotating naval task group in the Gulf of Aden (not far from the approaches to the Bab al-Mandab Strait) and the Arabian Sea, with future aspirations to expand its presence further into the Indian Ocean.

For a long while, the Islamic Republic withheld significant investment in major ships—the pride of any navy—but this did not mean Tehran was minimizing the importance of naval power. What Iran has done instead is invest in several areas aimed at giving punch to its forces—especially the IRGC. These investments have focused on smaller, more agile vessels and shore-based hardened facilities: missiles, rockets, and coastal artillery batteries; speedboats; and midget submarines, torpedoes, and mines. Iran also has a small and aging naval aviation force, and a command, control, communications, and information (C3I) system about which not much is known publicly, aside from the frequent pronouncements that no Western naval or air activity in the Gulf region will go unmonitored. (The sections that follow discuss each category, with subsequent tables detailing the more numerous or important systems.)

Like other open-source studies, this section relies mainly on Iranian sources for its data. Separately, any discernible use of various systems in Iran's publicized naval exercises offers limited, yet occasionally useful, measures of their likely performance in combat. The Iranian government's track record does not inspire confidence in the accuracy of the information it publishes; on the other hand, neither does the track record of Western sources in judging what Iran can and cannot do.

COASTAL ARTILLERY, ROCKETS, AND MISSILES

Iran has developed the following capabilities in rockets, missiles, and coastal artillery:

Artillery and rockets. During the past decade, Iran has deployed a large number of shore-based artillery and artillery rockets in a naval-support role with sufficient range and mobility, and ultimately accuracy, to help interdict navigation through the Strait of Hormuz and its approaches as an area-denial capability.

Missiles. Arguably the main menace in the Persian Gulf is Iran's arsenal of increasingly longer-range antiship missiles. They are potentially more lethal compared to guns and can theoretically control the Strait of Hormuz more efficiently. A good part of the Iranian coastline allows for deployment of missile batteries and their networked mobile fire-control units with relative ease at higher grounds. However, even if mobile and relatively autonomous, such batteries remain vulnerable to orbiting manned or unmanned aircraft, and unless effectively concealed or protected with layered air defenses, shore batteries are vulnerable to aerial attacks. As a result, the Pasdaran has made use of its tunneling

skills to build tunnel networks under mainland shorelines or islands, using these to hide launchers and associated sensors, many of which are claimed to be remotely controlled and operated.

Iran possesses a wide range of such missiles, yet the most worrying threat against Western naval assets in the region could be the Khalij-e Fars ("Persian Gulf") precision-guided antiship ballistic missile (ASBM), with a range of 300 kilometers and a 650 kilogram warhead. This so-called carrier-buster missile has an electro-optical seeker head, travels at four times the speed of sound, and if guided successfully to its target, can inflict significant damage. These attributes aside, carriers are tough targets and difficult to destroy unless their magazine takes a direct hit or they are damaged in numerous successful engagements with high-capacity weapons. A mission kill, however, will be somewhat easier.

Were Iran to effectively employ ASBM capabilities against moving targets, this would give it an enormous time-to-target advantage, further straining the limited naval ballistic-missile defense assets in the Gulf region. Such missiles would also potentially pose a viable threat against key onshore and offshore critical infrastructure facilities.

The IRGC claims an accuracy, at maximum range, of about 100 meters for its best-known missile, the Shahab-3, while outside sources estimate a much larger circular error probable. The CEP for other missiles, such as the Ghadr and Sejjil models, is unknown, but Iran says its latest medium-range missile, Imad, can be terminally controlled to its target. If the Islamic Republic succeeds in fitting some form of terminal guidance to any future intermediate-range ballistic missile (IRBM) reportedly under development, it might set its sights beyond nearby U.S. assets, focusing on strategic bases farther afield, such as Diego Garcia in the Indian Ocean. Iran in recent years has fielded several types of over-the-horizon (OTH) VHF radars and intelligence, surveillance, and radar (ISR) projects, which could benefit its future IRBM targeting. One OTH radar, designed at Sharif University's Shahid Rezaei Research Center and commissioned by the IRGC Aerospace Force, is said to cover the entire Persian Gulf.[25] Even though the operational value of these radars remains open to question, they likely would allow Iran to operate numerous "elephant cage" facilities around the country. To further help with its long-range target acquisition and data relaying, Iran may also adapt its substantial and expanding unmanned aerial vehicle capability. Specifically, OTH targeting using UAVs is a fast-growing Iranian capability not to be ignored.

Any long-range guided missile, if and when fielded, will likely target symbols of U.S. military might. This fits the profile of asymmetric Iranian warfighters seeking to shatter the West's image of invincibility, and to destroy its strategic advantage through isolated tactical actions with strategic significance. Iconic targets would include aircraft carriers, and headquarters such as those of U.S. Naval Forces Central Command in Bahrain, NATO's Combined Air Operations Center (various locations), and U.S. Central Command at al-Udeid Air Base, Qatar. They would also include special-mission aircraft like airborne warning and control system (AWACS) and Rivet Joint, large transport planes and aerial refueling tankers, stealth bombers, missile-defense sites, and Navy SEAL teams. Needless to say, any such action by a target-rich nation would draw in consequential retaliation against its own critical vulnerabilities.

The IRGCN also prides itself on its diverse arsenal of antiship missiles and continues to make guidance/control and range improvements to its shipborne and mobile shore-based missiles. Antiship missiles transported in trucks and minivans disguised as civilian vehicles can be deployed to residential areas and mix in with the road traffic.

SMALLER SURFACE VESSELS

Although Iran's long-range coastal artillery and shore-based antiship missiles can provide some level of area denial over substantial portions of the Gulf, surface vessels are required to actually control the area. Toward this end, the Iranian defense industry has built or acquired a large number of small- to medium-size fast-attack craft for operations by both the IRGCN and the national navy (IRIN) within the Persian Gulf and the Strait of Hormuz.[26] The IRGCN uses these boats mainly for maritime patrol and ultimately swarming and sneak missile attacks.

The most numerous vessel in the IRGCN arsenal is still the fiberglass Ashura motorboat and its newer versions—which are light and versatile and can carry a heavy machine gun, a multiple rocket launcher, or between one and four contact mines. Iran also operates a small number of North Korean Taedong-B and Taedong-C semisubmersible special operations attack craft, which were delivered in 2002.[27] Several other types of small boats are widely deployed. The Ferrari of the IRGCN, however, is the Seraj-1, which is a copy of the composite Bladerunner 51 racing boat, but armed with a machine gun and rocket launcher. Its top speed is reportedly over 70 knots (about 80 miles per hour). This has been the common trend in Iran: taking a foreign design using a variety of means, and modifying or customizing it to meet specific requirements. This could change in the future, though, if Iran invests significantly in homegrown technologies.

The Pasdaran's ten Tondar (North Korean Houdong) missile craft are scattered almost evenly among the five naval districts in order to provide the IRGCN a more seaworthy surface-combat capability with a displacement of around 200 tons and a top speed of 35 knots (about 40 mph). (For

more on Iran's five naval districts, see table 3, at the start of chapter 4.) Each Tondar is armed with two C-802/Noor/Ghader double-launchers—four missiles in total. These and other missile boats, however, need OTH targeting aid to hit targets at long ranges due to the limitations of their target-acquisition sensors. This means that in many cases they are armed with missiles that can shoot farther than the ships can "see," which dramatically reduces their effectiveness. So notwithstanding the maximum range of their missiles, these boats need to close in on their targets to acquire them, and in littoral warfare this means they are more likely to draw fire.[28] Possible solutions identified for this problem have included use of UAVs or manned aircraft as OTH target designation platforms for long-range antiship missiles and networked targeting using long-range coastal or airborne radars.

A key feature of the IRGC's rocket-firing swarm boats is their survivability, achieved by designing the boats to have a lower profile paired with high speed and maneuverability. For a similar reason, Iran has been working on unmanned surface vessels since the late 1980s, specifically through the development and fielding of remote-controlled suicide drone boats packed with explosives. Iran has positioned no fewer than 1,500 of them, each armed with 500 kilograms of explosives, along key Persian Gulf coastal areas. Originally designed to destroy warships, these drone boats have progressively been made more sophisticated with the provision of various sensors and data links. In January 2017, a Saudi frigate was struck by an explosive-laden Houthi drone boat off the coast of Yemen in the southern Red Sea. Evidence uncovered by a Britain-based research group in a captured intact boat indicates that Iran has provided Houthi forces with at least the technology to control such deadly weapons.[29]

But once detected, even low-profile unmanned boats are vulnerable to airpower and short-range defensive fire. Against such threats, the IRGC has deployed decoys and optical jammers,[30] but it is not apparent how effective these would be against some of the systems used by the U.S. Navy. Iran's revolutionary force is also arming its speedboats with increasingly longer-range missiles, in an attempt to outrange its opponent weapons. The IRGCN's academic minds have been looking into, and perhaps even testing, methods of countering the worrying destructive effects of low-energy lasers on its speedboats and drones.[31]

On September 19, 2016, the IRGCN's first naval district announced it had commissioned a fifty-five-meter high-aspect ratio twin-hull (HARTH) oceangoing vessel named the *Shahid Nazeri* (Saba-4), with a claimed seafaring range of some 10,000 kilometers. One feature of this unconventional vessel is its exposed helipad for a small helicopter in the class of Shahed 285C/Agusta-Bell 206 JetRanger. During its unveiling ceremony, the *Shahid Nazeri* was shown with a JetRanger on its wooden flight deck carrying a Nasr antiship missile under its belly. Labeled a "giant technological leap," the *Shahid Nazeri* and its future larger siblings are intended for sustained maritime operations at long ranges, designed to give the IRGCN more sea-basing flexibility near the approaches to the Bab al-Mandab Strait, where they maintain embarked antipiracy special operations teams. In an interview with an official IRGC publication in June 2012, then IRGCN commander Ali Fadavi spoke of an "exponential leap in the IRGCN's capability in the coming years, which would revolutionize the way *Sepah* deploys its forces."[32] Fadavi's successor claimed the *Shahid Nazeri* was capable of being equipped with missile and torpedo launchers.[33] The unarmed and thinly equipped aluminum-hull HARTH vessel somehow symbolizes the Pasdaran's aspirations and apparently future plans to conduct token operations in the western Atlantic and even the Gulf of Mexico.

SUBMARINES, TORPEDOES, AND MINES

In addition to surface vessels, Iran has invested heavily in submarines, torpedoes, and mines (see table 2).

Submarines. Midget submarines and smaller submersibles can sneak into undefended harbors, inlets, and marinas, where they can damage high-value naval vessels or blow up expensive royal yachts. They can also interfere with submarine fiber-optic cables, oil pipelines, and single-point mooring facilities for tankers, although with the risk of causing an environmental catastrophe. The IRGCN is known to have in service several types of semisubmersibles and "manned torpedoes," but no evidence indicates that they are widely deployed or that officials have developed comprehensive tactics to operate them.

Similarly, very little is known about the IRGCN's renewed interest in "special purpose" submarines, except for the concrete pen structure identified in at least one IRGCN base: the 112th Naval Brigade at Qeshm Island—one of the main IRGCN units in charge of controlling the Strait of Hormuz. Such pens can offer protection to both midget submarines and speedboats. In a 2016 television interview, Fadavi hinted at an existing capability to launch speedboats from hardened underground coves.[34] Three years before this statement, the IRGC reportedly received several small submarines of yet-unknown type, mainly to insert and extract special operations forces near hostile coastal areas. The IRGC is known for taking inspiration from unlikely sources, and in this case the Colombian drug cartels, which use mini-submarines to smuggle drugs, could be one.

On March 3, 2019, the IRGCN commander hinted at the test of an as-yet-identified subsurface-to-surface cruise missile during the 2015 "Great Prophet 9" naval exercise, for use

in the service's future secret submarine force.[35] An IRGC submarine requirement was mentioned in Iranian media as early as December 2012, when the IRGCN commander and a military industrial official talked of "midsize 'stealth' submarines tailored to the service's 'unique' missions."[36] While all submarines are "stealthy" by definition and design, some are quieter in their acoustics than others. A smarter, more disciplined use of active and passive sonars and telecommunications can also reduce a submarine's detectability. Moreover, sonar performance in the shallow waters of the Persian Gulf can be degraded by high ambient-noise levels, making the job of detecting, locating, and identifying submarines very difficult.[37]

The national navy, for its part, has invested substantially in submarine operations since the early 1990s. Its three Russian-made 2,300-ton Kilo-class boats are designed to operate in waters 200–300 meters deep. In any case, the IRIN has designed and built a fleet of nimbler and smaller submarines. At least twelve of the IS-120 Ghadir class of a North Korean design are in service with the national navy. This sonar-equipped midget submarine displaces about 200 tons when submerged, is very maneuverable, and can sit silently submerged while waiting for its prey. It can then attack using its two 533-millimeter homing torpedoes or, as a demonstration video released in February 2019 purported to show, Nasr antiship missiles.[38] Iran claims that on several occasions Ghadir submarines have caught U.S. Navy vessels off guard by surfacing unexpectedly near them.

Iran would face a number of challenges of its own in using submarines to impede shipping in the Strait of Hormuz. One would be coordinating the operations of the mini-submarines, although Iran is working on underwater communications equipment designed for this purpose.[39] Relatedly, the confined space in the strait limits the speed and maneuverability of submarines. Therefore, submarines could more probably operate in the southeast approaches to the strait, where the depth is about ninety meters and the tidal currents are comparatively weaker. At any rate, because Iran's submarines would eventually have to return to base to rearm, refuel, and undergo maintenance and repairs, locating them would only be a matter of time—not boding well for their survival in the event of a confrontation with the United States.

The IRIN claims that at least three newer types of more-advanced, indigenously designed submarines will eventually join the fleet, alongside the medium-size Fateh, which looks like a scaled-up Ghadir and was officially added in December 2018. Like the other locally built submarines, the

TABLE 2. IRANIAN SUBMARINES

	LENGTH (M)	DISPLACEMENT SURFACED (TON)	DISPLACEMENT SUBMERGED (TON)	MAX OPERATING DEPTH (M)	MAX DIVING DEPTH (M)	SEAWORTHINESS (DAYS)	SUBMERGED SPEED (KT)	SURFACED SPEED (KT)	WEAPONS
Ghadir	29	115	200	Unknown	Unknown	Unknown	11	Unknown	2x533mm torpedoes, mines
Fateh	48	527	593	200	250	35	14	11	4x533mm torpedo tubes + 8 torpedoes or Nasr antiship missiles, 8x mines
Besat	Unknown	1,000	1,200	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Qaem	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
877EKM Kilo	70	2,350	3,950	240	300	45	17	10	6x533mm torpedo tubes + 18 torpedoes

Fateh is probably intended for minelaying, special operations, and antishipping operations. Iran is also experimenting with wet submersibles, which require highly trained and motivated crews.

Torpedoes. In recent years, Iran seems to have greatly expanded its torpedo capability and has reportedly launched a production line for at least two 533- and 324-millimeter homing torpedoes. According to internal IRGC documents leaked online,[40] in 2004 Iran acquired and tested ten Shkval-E rocket torpedoes—which reach 200 knots (about 230 mph), with a 6-mile range—with the help of Russia, followed by additional orders. In 2008, the IRGCN and Iran's Aerospace Industries Organization began reverse-engineering the complex weapon under the name "Hoot" near Mashhad in northeastern Iran.[41] The operational status of the system is not known, but tests were conducted near the Strait of Hormuz in February 2015 and May 2017. Nor is it known whether this project has resulted in any series production; the example put on display west of Tehran in October 2015 could either be an original or a copied version of the Shkval. Iranian possession and mastery of such a system could be potentially significant in the Gulf, although it remains unverified, as are the safety, reliability, and capabilities of the original Russian system on which Hoot is based.

Sea mines. Because the deepest areas of the Persian Gulf are mostly inside Iranian territorial waters, and the shallower waters in the southern reaches of the Gulf are strewn with small coral islands, oil wellheads, production platforms, and underwater pipelines and mounds, maritime traffic is forced into designated deepwater channels near Iran's islands or coastline. Iran could exploit this advantage during sea-denial operations by engaging in large-scale offensive mining of chokepoints and deepwater channels.[42]At the same time, strong tidal currents of 3–4 knots in the strait itself make it a difficult place for conventional mine warfare, given that moored contact mines will often be pulled by currents below the hull of warships. This explains the preference for using limpet mines deployed by speedboats or divers, as demonstrated during the June 13, 2019, incident just south of the Strait of Hormuz, when two transiting tankers were attacked by speeding boats attaching limpet mines to their target hulls.

The simplest and most effective way for Iran to impede Hormuz shipping on a larger scale will be to lay sea mines using fast boats hugging the Iranian shores and islands, as well as civilian craft such as *lanjes* (Persian for "dhows"), barges, or landing craft.[43] Countering minelaying is generally difficult once the mines are in place. It is time consuming and costly and can be frustrated by follow-up mining. The IRGC frequently simulates mining of the strait using tens of small boats and Basij frogmen, the most publicized instances of which took place in 2010 and 2015. However, the impact of such mining is a matter of dispute among observers.[44] An extensive and aggressive air and sea operation will be required to guarantee safe minesweeping and convoy-protection operations. Physically occupying some of the northern Iranian shores and rugged mountains overlooking the strait may also be necessary on a temporary basis, which could expose the occupying ground forces to protracted combat and significant casualties. Other observations suggest the limited impact of mines. The experience of the Iran-Iraq War, for example, showed the great difficulty of using mines against large oil tankers, a problem that only grew more difficult now that tankers are double-hulled for environmental reasons.

The IRGCN considers minelaying one of its most important missions. The Pasdaran claims to have advanced sea mines in its arsenal,[45] and so far has displayed large- and medium-moored contact mines; bottom-laying influence mines with magnetic, acoustic, and pressure fuses; limpet mines; and remote-controlled mines. Development of more-sophisticated mines certainly appears to be within Iran's technological capability, and Iranian military commanders might have alluded to possible use of remote-controlled or programmable influence mines when talking of "smart control" of the Hormuz Strait.[46]

Little is known about the IRGCN's mine countermeasure capabilities. Aside from the IRIN's four or five operational Sikorsky RH-53D helicopters—joined by at least one towed minesweeping system refurbished back into service in 2014—Iran does not appear to have any other mine-clearing systems in its inventory.

AVIATION AND AIR DEFENSE

The IRGCN has five Mil Mi-171Sh helicopters (SN-2101–2105, of which at least two are operational) adapted for maritime operations, including a weather radar and the capability to fire Noor and Ghader antiship missiles reportedly with or without the help of secondary acquisition platforms while lacking a targeting radar. A radar-equipped single-seat Shahed 285C helicopter that can fire Kowsar antiship missiles has been shown to Iranian officials several times, but it reportedly has not passed beyond the prototype stage. The IRGCN could mount daylight commando raids by inserting its own Sepah Navy Special Force (SNSF), based at Faror Island, or the IRGC ground force's Sabirin special operations units, using Mi-171 helicopters. The seizure of the British-flagged tanker *Stena Impero* on July 19, 2019, in the middle of the strait shipping corridor—an operation that sent fast-roped SNSF commandos from a Mi-171 onto the moving ship—exemplifies this method's versatility.

The Pasdaran also operates three Agusta-Bell JetRanger

light helicopters, including serial numbers 2305 and 3102, which are modified, as suggested earlier, to carry a Nasr antiship missile on a specially developed centerline pylon. Yet nothing indicates that these helicopters have been adapted for sustained maritime operations. Likewise capable of launching missiles and certain types of standoff weapons are Iran's F-4E Phantom II fighter-bombers and its very few fully operational Sukhoi Su-24MK strike aircraft.

In July 2018, the IRGC Aerospace Force completed the overhaul of ten ex-Iraqi Sukhoi Su-22 "Fitter" aircraft that were granted sanctuary in Iran during Operation Desert Storm in 1991 and had been grounded ever since, with the help of Syrian, Belarusian, and Ukrainian experts. As for the Su-25 "Frogfoot" aircraft that ended up in Iran the same way, the Islamic Republic appears to have returned all these to Iraq, with the exception of those bought directly from Moscow. Iran's Su-22s are armed with Yassin GPS-guided glide bombs, Bina laser-guided missiles, and reportedly Nasr and Nasir antiship missiles of native origin. The IRGC also claims its Fitters will soon be armed with a cruise missile having 1,500 km range, which would put the central Arabian Sea and Bab al-Mandab Strait at risk. Based in Shiraz, IRGC Su-22s can be forward-deployed to the Bushehr, Bandar Abbas, Jask, or Konarak airfields as necessary.[47] If this endeavor succeeds, IRGCN units can be expected to receive future air support from the Guard's small inventory of Russian-origin planes, in addition to fifteen EMB-312 Tucano ground-attack aircraft.

At its naval base in Bandar Abbas, the IRGC has also deployed a number of Bavar ("Faith") wing-in-ground-effect light seaplanes. These native-made aircraft in their present configuration have limited endurance and combat ability, but armed versions with Kowsar light antiship missiles are reportedly under development. Although offering potential in roles such as airborne observation, attack-target-data relay, and coastal patrol, these seaplanes will have few real applications in high-intensity combat situations.

The IRGC is known to have deployed several types of indigenously produced UAVs, including Ababil-3, Mohajer-4 and 6, and Yasir-2, some of which can be loaded with explosives for use in "kamikaze" missions. These attack UAVs were developed to counter the powerful U.S. naval presence in the Persian Gulf in the mid-to-late 1980s, but they were never used in the naval arena—although an armed UAV capable of carrying up to six RPG rounds saw limited combat use against Iraqi ground forces, probably the world's first operational employment of an attack UAV.[48] Later, Iran adapted drones for maritime surveillance and frequently flew them close to or over U.S. naval vessels—especially aircraft carriers—not only during transit through the Strait of Hormuz but also while they were on station conducting routine operations.[49] In August 2017, an Iranian drone nearly collided with a U.S. Navy F/A-18 Super Hornet while the American jet was preparing to land on the USS Nimitz in the Persian Gulf. Iranian UAVs regularly and closely monitor and interfere with U.S. carrier operations in the Gulf, and they appear to lack sufficient awareness to avoid near-miss situations.

Iran feels a critical need for theater air defenses given the inadequacy of such defenses aboard its naval vessels and fast missile boats and the strength of adversarial air forces in the region. In late April 2019, only days before four tankers were struck by limpet mines off the coast of Fujairah, Iran temporarily moved an S-300 air-defense battery out of its permanent air base at Bushehr, and by May 20, 2019, this battery was observed moving by road toward the Asaluyeh military airfield, where it could cover Iran's entire South Pars gas field and central Gulf shipping lanes until mid-July—right before the shoot-down of a U.S. drone off the Strait of Hormuz. With another battery likely to be installed at Bandar Abbas, supplemented by indigenous systems such as Talash-1/-2, Tabbas, TOR-M1, Sevom-e Khordad (3rd of Khordad), Panzdahom-e Khordad (15th of Khordad), and Mersad, Iran can cover the scope of Persian Gulf shipping routes. Iran theoretically can use these systems to provide its surface units a protective shield and relative freedom of action by denying enemies the ability to quickly achieve air dominance over the Persian Gulf.[50]

COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE

In July 2010, the IRGCN moved its entire headquarters from a Tehran suburb to Bandar Abbas to facilitate operational control over forces. Three years later, Khatam al-Anbia 2 Maritime Headquarters was formed to better coordinate activity among the five naval districts and independent units of the IRGCN. Both Khatam al-Anbia 2 and Khatam al-Anbia 1, the latter of which oversees the national navy's operations, answer to the Khatam al-Anbia Central Headquarters. In addition, the IRGCN runs a "Research and Self-Sufficiency Jihad Organization" with separate bureaus dealing with naval engineering, surface and subsurface warfare, marine electronics/communications/radar, electronic warfare (e.g., radar, communications, and GPS jammers), navigation, sonar and acoustics, missile technology, and cartography.

The IRGC's naval communications capabilities have come a long way since 1986, when nonwaterproof radios went dead in the middle of combat. Today, Shiraz Electronics Industries, for example, manufactures a variety of maritime (surface and subsurface) communications, navigation, and acoustics-detection equipment, including HF modems, coastal mobile radars (e.g., 2031 surveillance and naval target-tracking radar with a claimed range of 130 miles),

and electronic-support measure stations. Likewise, the national navy's self-sufficiency organization has reportedly developed a variety of electronic-warfare equipment—for use by both surface and submarine units—designed to counter U.S. systems present in the Gulf region.

More important from the perspective of its operational capabilities, the IRGCN runs an extensive fiber-optics communications network that stretches along the length of the northern Persian Gulf coastline, as well as islands, to ensure secure and uninterrupted communications in wartime. The *New York Times* reported in June and August 2019 that a U.S. cyberattack on an IRGC intelligence unit in the aftermath of the downing of the June 20 U.S. Global Hawk UAV wiped out a critical database and disabled computers and military communications networks used to select shipping targets and coordinate attacks in the Persian Gulf.[51]

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8 Maurice C. Ernst, "Iran's Threat to Persian Gulf Oil Supplies," secret memo from national intelligence officer for economics to director of Central Intelligence, NIC #01429-84, March 5, 1984, declassified and made available via CIA web portal.
9 Khodaverdikhan, *Nabard al-Ommaya*, 12. The Basij Resistance Force is the popular reserve militia of the IRGC, and it can be mobilized in times of war or internal emergencies to fill the Guard's ranks and fulfill various supporting roles. It has assumed an even more important role than in the past as a result of the IRGC's reorganization in 2007–8.
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13 Ibid., 93.
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al-Zubair and Rumaila oil fields in the south, as well as geopolitical considerations, also led Iraq to establish two offshore oil terminals in 1962 and 1974 with combined capacity of up to 2.5 mb/d in the northern Persian Gulf. After 1975, Iraq connected its northern and southern oil fields and terminals using a reversible "strategic pipeline" with a capacity of up to 1.4 million b/d, greatly increasing its export flexibility. Iraq's strategic projects during the 1970s increased its export capacity to 3.3 mb/d. See Anthony Cordesman, *The Changing Dynamics of Energy in the Middle East*, Vol. 1 (Westport, CT: Greenwood, 2006), 230. With the start in 1980 of its war against Iran, Iraq had to suspend oil exports from the Gulf, and in 1982 Syria shut off the Kirkuk–Baniyas/Tripoli pipeline at Iran's request, leaving Iraq with only the Kirkuk–Ceyhan pipeline. Baghdad later compensated for those losses by increasing the capacity of the Turkish line to 0.9–1 mb/d by 1984 and 1.6 mb/d by 1987, and later by linking up to Saudi Arabia's cross-country Petroline for a further 0.5 mb/d capacity by the end of 1985. Added to them was the Iraqi Pipeline in Saudi Arabia project, a 1.65 mb/d apparatus built in parallel to Petroline. Kuwait and Saudi Arabia also sold an estimated 0.3 mb/d of oil for Iraq's account, with the expectation that Iraq would compensate them later. See Fredrick W. Axelgard, *"War and Oil: Implications for Iraq's Postwar Role in Gulf Security,"* in Iraq in Transition: A Political, Economic, and Strategic Perspective, ed. Fredrick W. Axelgard (Boulder, CO: Westview, 1986), 3–15.

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4
OPERATIONAL CAPABILITIES AND INTENTIONS

This chapter begins by describing the division of responsibilities between the national navy and the IRGC. It then describes the advantages Iran seeks to exploit through its naval strategy—a matter easily overlooked by outside observers when considering Iran's challenges against the much larger Western navies and the Gulf countries, with their sophisticated systems. Building on those two components—the institutional arrangements and Iran's advantages—the chapter then turns to prospective Iranian naval strategic objectives and assets it might target to achieve those objectives.

INSTITUTIONAL ARRANGEMENTS

> *"WE YEARN FOR THE DAY WE CAN'T EXPORT OUR OIL. IT WILL BE A UNIQUE OPPORTUNITY FOR US TO DISRUPT AND STOP THE ENTIRE WORLD'S ENERGY LIFELINE."*
>
> *—Cdre. Ali Fadavi, former IRGCN commander*

Iran's naval strategy assigns its two naval arms two separate geographical areas of responsibility as well as an operational division of labor. In this division, the IRGCN has a "brown-water" and the IRIN a "blue-water" role, although this has not precluded the IRGC from planning a major expansion of its strategic reach—albeit still in a combined asymmetric/symmetric manner—in the coming years, and the national navy from forming small irregular combat teams. Nevertheless, the division between the two services reflects two different mindsets. While the national navy has chosen to maintain its focus on conventional naval warfare, the revolutionary navy has invested from the beginning in a light, agile force structure consisting of small, fast inshore vessels armed with missiles and rockets, a multilayered shore-based missile force, naval mines, and some light aviation. They both have been affected by periodic international sanctions and have opted to source most of their new equipment domestically, although many of those systems tend to be based on Chinese and North Korean designs.

The IRGCN, reorganized geographically in 2007, consists of five naval districts, all in the Persian Gulf and the Strait of Hormuz, in addition to independent bases in Jask, Chabahar, and Babolsar in the Caspian Sea (see table 3). The IRGCN has bases or observation posts at almost every Persian Gulf, Strait of Hormuz, and Gulf of Oman port, harbor, and island.

The Islamic Republic owns the longest and most populated area of coastline along both the Persian Gulf and the Gulf of Oman. Since 2007, Iran has divided patrolling of its waters and coastline in the Persian Gulf, Strait of Hormuz, and Gulf of Oman between its revolutionary and national navies. Here, the IRGCN seeks to control shipping in the Persian Gulf and the entire Strait of Hormuz, and the IRIN handles long-range surveillance of incoming maritime traffic before reaching the strait, and defending Iran's coastline with the Gulf of Oman and its civilian shipping down to the 10th parallel north, in a blue-water role. However, arguably the most challenging and controversial task is a joint responsibility of both navies, but one often claimed by the revolutionary navy is that of monitoring maritime traffic through the strategic Strait of Hormuz.

For some time, overseeing the navigation channels and their separation zones immediately inside the Persian Gulf has fallen to IRGC surveillance posts and marine units on each of the Iranian islands occupying the eastern approaches to the Gulf. In fact, in November 2012, the IRGCN formed its fifth naval district at the small port village of Bandar-e Shenas, about five miles southwest of Bandar Lengeh, exclusively to oversee the marine area between Qeshm and Kish Islands, which includes Abu Musa, Greater and Lesser Tunbs, and Sirri—the so-called Naziat ("Angels of Death") islands. The waters separating Abu Musa and the Tunbs constitute the only passage deep enough for transit by laden supertankers.

TABLE 3. IRGCN OPERATIONAL DISTRICTS

DESIGNATION	LOCATION	COMMANDING OFFICER	MISSION	NOTES
Saheb al-Zaman, 1st Naval District	Bandar Abbas	Capt. Abbas Gholamshahi	"Special mission" of controlling the shipping in and out of the Strait of Hormuz, supporting other districts	Includes IRGCN headquarters and command-and-control center, Imam Sadjad Special Commando and Marine Brigade, 16th Assef Coastal Missile Group , 112th Zolfaqar Surface Combat Brigade (Qeshm; Lt. Cdr. Mehdi Hashemi), Abu Musa underground fortifications
Nouh-e Nabi (Noah the Prophet), 2nd Naval District	Bushehr	Capt. Ramezan Zirahi	Control of the northern and central Persian Gulf, including Kharg oil terminal and Bushehr nuclear plant	Includes Shahid Mahalati base (Bushehr), 214th Hazrat-e Amir Marine Brigade, 26th Salman Coastal Missile Brigade (Borazjan), 216th Fater Coastal Missile Brigade, Imam Muhammad Bagher 2nd Naval Air Station (Bushehr)
Imam Hussein, 3rd Naval District	Mahshahr	Vice Cmdr. Yadollah Badin	Control of northwestern Persian Gulf and Khuzestan coastal waters	
Sarallah, 4th Naval District	Asaluyeh	Vice Cmdr. Mansour Ravankar	Control of the central Persian Gulf, including the South Pars gas field	Includes 412th Zolfaqar Surface Combat Brigade (Maj. Abbas Gilak)
Imam Muhammad Bagher, 5th Naval District	Shenas port village, west of Bandar Lengeh	Vice Cmdr. Ali Ozmaei	Control of the so-called Naziat islands, including Greater and Lesser Tunbs, Abu Musa, and Sirri, and the Strait of Hormuz	Includes Tondar, 512th Zolfaqar Fast-Attack, and Qader Naval Brigades (5th District Coastal Missile Group), with some of the most modern missile systems in the IRGC inventory, an air-defense brigade, and at least one marine brigade. Just 12 km north and northeast of Bandar Lengeh, respectively, are an extensive underground bunker complex and presurveyed missile launching pads.
Imam Ali Independent Naval Base	Chabahar	Cdr. Seyyed-Mehdi Mousavi	Naval activities in the Gulf of Oman, including intelligence gathering	Participates in controlling Iranian territorial waters
Samen al-Hojaj Naval Base–North	Babolsar, Caspian	Capt. Parviz Gholipour	Mostly serves training purposes	
Imam Khamenei Naval Academy	Zibakenar, east of Anzali, Caspian	Vice Cmdr. Hossein-Ali Zamani Pajouh	Presides over all IRGC naval and maritime colleges	Includes Javad al-Aeme Surface Warfare College, Sayyed al-Shohada Jihadist Warrior College, Marine and Special Forces Training College, and Imam Sadeq Missile Warfare College
IRGCN Engineering Command	Borazjan			
Aba-Abdullah Naval Special Forces Brigade	Faror Island	Vice Cmdr. Sadeq Amooie		Home of Sepah Navy Special Force, training base for special warfare tactics modeled after the U.S. Navy SEALs

Other major bases and units include the Arvand naval surveillance base, located at the mouth of the Shatt al-Arab waterway and designed to secure the Iranian side of the waterway; the IRGCN's Engineering Command in Borazjan; the Emamat naval/missile base just outside Jask; bases on various islands including Kharg, Abu Musa, the Tunbs, Farsi, Qeshm, Sirri, Larak, and Lavan; and the IRGC naval special forces base at Faror Island.

Separately, in ceding much of the Caspian Sea security role to the IRIN's now rapidly expanding Northern Fleet, the IRGCN has focused on the south. Still, however, since 2016 the IRGCN has concentrated all its training activities at the Imam Khamenei Naval Academy in Zibakenar, near Bandar-e Anzali on the Caspian coast. In the meantime, the IRGC has maintained a low-profile presence in the Caspian by expanding its Imam Khamenei Naval Academy and the Samen al-Hojaj naval base.

Like any other military service, the IRGCN expects disruption of its command-and-control network in wartime. In preparation, it claims to have created a decentralized command structure that allows for more-autonomous district and sector operations. Small, local, mobile, and agile combat units form the basic building blocks of a "mosaic" (or grid) defense strategy aimed at turning any enemy blitzkrieg into attrition warfare.[5] Under such wartime circumstances, the IRGCN will still be directed from a hardened command-and-control bunker in Bandar Abbas. In the naval arena, speedboats will be taken out of camouflaged coastal or inland hide sites and bunkers, hauled on trailers to coastal release points, and given mission-type orders that obviate continuous contact with their chain of command. Each team will be assigned a naval sector of operation, within which, in the event of a conflict, it will identify and strike enemy naval assets or civilian maritime traffic already marked in the IRGCN's now infamous potential-target database.

ADVANTAGES IN ASYMMETRIC WARFARE

It is not difficult for an observer to identify challenges faced by the Iranian navies, such as the impact of foreign restrictions on selling military-grade equipment to the Islamic Republic, the continuous presence of Western navies off Iran's Gulf shores, and the immense financial resources available to the defense establishments of Iran's Gulf neighbors. All the same, Iran enjoys considerable advantages for conducting the asymmetric naval strategy it has adopted. Those advantages are geographic, economic, and human and ideological in nature.

SNSF: The Revolutionary Navy's Special Unit

Operating out of Faror Island, the IRGCN's special naval warfare unit, branded as the Sepah Navy Special Force, bears the official name of Aba-Abdullah Naval Special Forces Brigade.[1] Established in 2008 specifically to counter the U.S.-led coalition in the Persian Gulf, and headed by charismatic Iran-Iraq War veteran Mohammad Nazeri until his suspicious death in 2016, this base trains the Iranian version of the U.S. Navy SEAL/Marine Reconnaissance personnel, as well as members of the "Axis of Resistance," including Lebanese Hezbollah and Syrian naval commandoes. The SNSF often dispatches maritime security teams from its moored "mother ships" to Iranian merchant vessels and tankers crossing the pirate-infested waters of the Arabian Sea and Gulf of Aden, collecting intelligence on Saudi Arabia and Western coalition forces in the process. For many years, Iran has maintained a floating armory ship near the strait that can potentially be used as mothership and intelligence collection post as well. The most recent is the 23,176-ton bulk carrier Saviz, anchored since November 2017 in the middle of Red Sea shipping lanes northwest of the Houthi-controlled port of Hodeida.[2]

Nazeri introduced American-style uniforms and equipment, and Iranian-flag shoulder patches, to boost morale and nationalistic sentiments within his unit. Members undergo specialized training, including diving, parachuting, demolition, sniping, hostage rescue, and beach and ship assault. The SNSF has even been the subject of a popular Iranian TV reality show, *Farmandeh* (Commander).[3] The outfit is currently commanded by Vice Cdre. Sadeq Amooie, who previously led the IRGCN's Imam Sadjad Special Marine Brigade, reportedly tasked with performing "smart blockades" of the Strait of Hormuz from the heavily fortified Abu Musa Island.[4]

On the afternoon of July 19, 2019, in an event noted in previous chapters, armed speedboats from this unit intercepted a British-flagged tanker, *Stena Impero*, before it was boarded by SNSF commandos rappelling from a navalized Mi-171 helicopter. They commandeered the ship and its twenty-three crew members as it traveled in the Strait of Hormuz's westward corridor in Omani waters, and guided it to an anchorage near Bandar Abbas. The operation was ordered in retaliation for an earlier British seizure of a supertanker carrying Iranian crude oil to Syria as it transited the Strait of Gibraltar.

GEOGRAPHIC ADVANTAGES

Iran's long shoreline offers a range of geographic advantages to unconventional naval warfighters, including mountain ridges as high as 6,500 feet (2,000 m). Iran has also fortified its strategically located islands at the mouth of the Persian Gulf. Combined with the relatively confined waters there, this limits the adversary's freedom of maneuver and enables Iranian forces to target vessels with long-range coastal weapons. Moreover, Iran's Gulf network of islands, inlets and coves, offshore structures, and buoys allows for staging and supporting extended patrol and reconnaissance missions, precision mining operations, sneak missile attacks and rocket barrages, and swarming attacks.

To operate effectively, unconventional warfighters like Iran also seek to avoid detection by the enemy and attack at a time and place of their choosing, employing a variety of camouflage, concealment, and deception measures, which include missile launchers disguised as civilian trucks, or remote-controlled explosive-laden or armed boats and dhows with a civilian appearance.

Those fighters and their logistical support units also require concealed bases, staging areas, and passages to and from their areas of operation. Harbors, piers, and fishing and trading villages and towns scattered along Iran's southern coastline offer excellent hiding places for small surface combatants, but Iran has also bored tunnels into rocky islands where boats can launch directly into shipping lanes. Speedboats can rush out of covered locks and concrete pens, or can be launched from flatbed trucks under cover of darkness during high tide without any special accommodations. These capabilities can increase surprise and reduce transit time to the points of contact.[6]

In addition, the IRGCN has organized its now fully integrated Basij forces from among local inhabitants to assume more serious support and operational roles. In the so-called mosaic defense concept, small Basij groups (Ashura and Imam Hussein battalions) are formed in towns and counties, to operate autonomously in defense of their local geographical area but under the operational control of the provincial IRGC commands.

Generally speaking, the proximity of available staging areas and logistical depots to theaters of operation in littorals allows faster and more flexible movement of naval assets in depth and between theaters using a network of coastal roads.[7] This advantage, which the IRGCN also enjoys, is expected to compensate for some of the technological advantages enjoyed by more-advanced adversaries such as the U.S. Navy.[8] In fact, Iranian autonomous coastal missile teams practice deployment and launching of their antiship missiles at a range of some 75–185 miles (120–300 km), from hidden sites tens of kilometers inland.

In addition, Iran has dug numerous tunnels in coastal areas to boost the resiliency of its defenses overlooking the sea. These are dug by the Hara Organization, formerly the IRGC's 401st Engineering Group, which is the tunneling arm of the IRGCN's dedicated Ghorb-e Nouh Construction Headquarters. The Tunbs, Sirri, and Abu Musa in particular now house very elaborate tunnel networks to shelter missile batteries, artillery pieces, speedboats, and UAVs. The Pasdaran's construction conglomerates, the most prolific diggers in Iran, own no fewer than seventeen giant tunnel-boring machines (TBMs), including German-made Herrenknecht and Wirth hard-rock borers. Each TBM can bore holes as wide as 50 feet (15 m) at a daily rate of about 100–165 feet (30–50 m) and up to 1.25 miles (2 km) per month.[9] When bored near or into the sea, they can house explosive "autonomous craft" for surprise attacks. In 2016, Saudi navy patrols seized a speedboat from Yemeni Houthis that was modified for such missions reportedly using Iranian-made optical and GPS-based guidance and control components. Many IRGCN bases are expected to have warehouses filled with suicide autonomous craft.

As part of their way of combat, Iran's asymmetric warfighters will also try to maximize the fog of war and confuse the enemy by hiding among civilian elements. The daily transit of more than three thousand local vessels and dozens of crude carriers and cargo ships through the Persian Gulf and the Strait of Hormuz can make the task of differentiating friend from foe very difficult for conventional forces operating there, especially when the unconventional forces use local civilian boats and vessels to approach and attack their targets.[10] Such tactics risk civilian casualties in times of war and peace alike. In July 2012, in a case of mistaken identity, a U.S. naval ship fired at a small fishing boat it thought was approaching near the Port of Jebel Ali, killing one and injuring three of the Indian crewmembers.[11] In view of historical trends, the Iranian regime will almost certainly welcome, if not instigate, similar incidents given that it would benefit psychologically from any error involving collateral damage and civilian casualties

ECONOMIC ADVANTAGES

Critical physical infrastructures around the region include water-desalination plants and associated pumping stations, power-generating facilities, seaport and airport facilities, submarine cable nodes, main onshore and offshore oil- and gas-production sites—including separation plants—and export facilities. These sites offer easy high-value targets to asymmetric naval warfighting planners.[12] Defending them would require a major effort, in turn exposing more potential targets to hostile forces. In the case of a major escalation in the Persian Gulf, Iran would have the option of using terrorist sleeper cells in the southern Gulf Arab states to destroy oil and gas facilities.[13] Saudi

FIGURE 3. UNDERGROUND COVE, STRAIT OF HORMUZ
This cove, occupied by the 112th Zolfaqar Naval Combat Brigade ("Watchmen of Hormuz"), first naval district, is located on the southern shore of Qeshm Island.
Image provided by the author. Photo credit: Google Earth.

The IRGCN's 112th Naval Combat Brigade base on the southern coast of Qeshm Island directly overlooks the Strait of Hormuz. Part of the base includes a large underground pen (entrance shown here) which houses a large number of both manned and unmanned speedboats, the latter configured as "waterborne improvised explosive devices" (WBIEDs), or explosive-laden suicide boats, as well as rocket-firing drone boats and submersibles. The island base also houses coastal missile batteries.

This particular water complex has been under construction since the early 2000s, and although it has yet to be officially unveiled, the IRGCN commander alluded to it during interviews in January and May 2016, probably around the time of its completion. The IRGCN's Hara Organization has reportedly been involved in digging tunnels to protect its assets since 1992.

Arabia and Kuwait have reported arresting members of several local Shia groups trained by Iran to strike their oil infrastructure, although some experts have long cautioned about overblowing the existence of a Shia fifth column in eastern Saudi Arabia.[14] In November 2017, Bahrain accused Iran of using saboteurs to bomb a chokepoint oil pipeline used by the tiny Gulf nation to import 230,000 barrels per day (bpd) from Saudi Arabia.[15] Iran can back up any such activities with cyberattacks against GCC oil infrastructure. In August 2012 and then again in December 2017, Iran was suspected of launching sophisticated malware attacks against Saudi Aramco's computer and safety systems.[16] Moreover, Iran's ability to domestically produce equipment, arms, fuel, and other critical supplies enables it to sustain an asymmetric naval campaign for a considerable period of time.

In 2017, Iran produced about 1.8 million bpd, exported 0.992 million bpd, and imported 0.096 million bpd of petroleum products. With full commencement of activity at the new Setareh-ye Khalij-e Fars (Persian Gulf Star) condensate refinery in Bandar Abbas, Iran finally eliminated gasoline imports and became a net exporter. In the meantime, Iran will still depend on the Strait of Hormuz to export almost all its crude oil, and will be unlikely to stop using it in a limited-conflict scenario, until it can start operating and expand the capacity of its alternative Gorreh-Jask pipeline and terminal project.

Iran has one of the world's highest per capita fuel-consumption rates, and to address this vulnerability, the government has invested considerably in its refining sector over the past few years, especially in high-octane gasoline production. It reportedly reached a record daily rate of some 24 million gallons (90 million liters) in summer 2018 and hit about 28 million gallons (107 million liters) by March 2019, when the third phase of Persian Gulf Star overcame delays and went online, bringing the facility's total daily output to 9.5 million gallons (36 million liters). Iran currently has a reported 4-million-gallon (15-million-liter) surplus of gasoline production. Those milestones make the country less vulnerable than it was during the previous round of energy sanctions (2012–16), when it had to import fuel. Current trends indicate that average production and consumption are almost evenly matched at around 21 million gallons (80 million liters) per day.

The $4 billion Persian Gulf Star spans seven hundred acres near Bandar Abbas and is claimed to be the most advanced refinery in the Middle East. It is the only Iranian gas condensate refinery and has been upgraded to process 480,000 barrels of daily feedstock brought from the South Pars field, using a 300-mile (485 km) pipeline. The reported 9.5 million gallons of high-octane gasoline it produces daily constitute about 55 percent of Iran's domestic demand; the refinery also produces 3.7 million gallons (14 million liters) of gas oil, now that all three phases of its construction are fully operational. A fourth phase, aimed at bringing total daily production to 10.5 million gallons (40 million liters), is being planned. Despite achieving gasoline/gas oil self-sufficiency, it remains to be seen how Iran can maintain this amid a continuing rise in daily domestic consumption, which in summer 2018 hit a record 32-million-gallon (122-million-liter) milestone, prompting authorities to classify as secret future consumption statistics.[17] In October 2019, Iran's oil minister raised the possibility of a return to gasoline rationing during the second half of 2020, but in fact no later than November 2019 Iran abruptly introduced gasoline rationing and dual price hikes, triggering widespread, bloody unrest.

If this trend continues, Iran might need to increase imports of gasoline/gas oil once again. Such a continued dependence on fuel imports will undermine its energy security and increase its dependence on the Strait of Hormuz.

HUMAN AND IDEOLOGICAL ADVANTAGES

Arguably, the human factor plays an important, if not a vital, role in asymmetric warfare, especially when combatants are energized by religious or nationalist zeal. The Islamic Republic has exploited the historical resentment of local residents toward foreign occupation, strengthened by the long and bitter Iran-Iraq War experience. Yet even the use of modern tools such as computer games and reality TV shows has had not always succeeding in bringing this passion to new generations.

The IRGC places religious belief at the core of the Iranian concept of asymmetric warfare.[18] This concept rests on three components: political and religious prudence and faith in *velayat-e faqih* (the doctrine of clerical rule underpinning Iran's theocracy); motivation, inventiveness, and resilience in the face of adversity; and the culture of jihad and martyrdom. The Quran promises that the Islamic warrior who embodies the qualities of faith, prudence, and patience will achieve superiority over his adversary by a factor of ten.[19] Indeed, Iran's leadership seeks to imbue its fighters with a deep belief in their spiritual superiority over their perceived enemies—a view reinforced by several encounters with Western forces in the northern Persian Gulf. Therefore, the IRGC's leadership has chosen to emphasize the spiritual dimension in preparing for asymmetric warfare.[20] To this end, it has carried out a program aimed at deepening revolutionary zeal and religious fervor among the rank and file as the IRGC's "center of gravity."[21] This is part of a broader effort to institutionalize its concept of Alavi warfare (derived from the real-life example of the warrior-statesman Imam Ali—the Prophet Muhammad's

cousin and son-in-law). Proponents of this concept believe it will ensure success on the battlefield because of its focus on duty (*taklif*) rather than the military objective or end state.[22] The concept could potentially be problematic, however, by making martyrdom fighters prone to overly emotional responses. On several occasions during the Iran-Iraq War, for example, IRGC small-boat units responded to successful U.S. attacks by swarming whatever undefended or insignificant target they could find.[23] This developed into what is now often called "unsafe and unprofessional" Iranian behavior by Western navies, with Iranians themselves referring to the disposition as "resolute and nonconservative."

In the IRGC's concept of asymmetric warfare, the ideological or "spiritual" superiority of the community of believers is considered as important as any other factor—hence the value attached to the doctrines of Alavi and Ashurai warfare.[24] Ashurai warfare, for its part, is grounded in the "sincerity" of the death of Hussein ibn Ali—Imam Ali's son and the Prophet Muhammad's grandson—during the Battle of Karbala, on the tenth of Muharram, 680 CE, and the notion that standing up to injustice should overpower pragmatic considerations. Similar to Sun Tzu's teachings, IRGC's spiritual warfare paradigm embraces "pure (yet structured) judgment and foresight" (*basirat*) in understanding and facing the enemy, along with a resolute belief in serving as the hand of God.[25] According to Iran's Supreme Leader, *basirat* is the key to victory, because it empowers individual warfighters to make correct decisions and "execute the necessary action at the right moment without delay." This demonstrates the importance the Islamic Republic attaches to both moral and military superiority over its enemies. Grounded in this religious intuition, an IRGC commander is entrusted with making "sound military decisions" on his own in a highly contested and confusing asymmetric environment.[26]

Elaborating on the concept of Alavi warfare, Iranian revolutionary theorists define it as defensive war based on religious and national values using fighters who are psychologically prepared to battle to the death if necessary, and who have the necessary moral capacity to persevere militarily. This Shia-inspired concept prioritizes "cause" over "objective." In other words, for a military force adhering to the concept, the mere act of fighting and fulfilling its duty to the fullest—including martyrdom—is an end in itself; the military outcome is of secondary importance. The IRGCN has incorporated this concept into its operational plans by giving the ideologically committed Basij youth a more prominent role in waging bold swarming attacks.[27] This martyrdom culture, according to IRGC commanders, is Iran's most fearsome weapon, even though it often leads to questionable outcomes.

TO POLICE, OR NOT TO POLICE, THE GULF

"OUR WAR IS A WAR BETWEEN OUR RELIGION AND ALL THE INEQUALITIES OF THE CAPITALIST WORLD; THEREFORE, THIS WAR HAS NO BOUNDARIES. OUR WAR IS A WAR OF FAITH AND DEVOTION. AND THIS DRAWS OUR STRATEGY."

—Div. Gen. Mohammad Ali Jafari, former IRGC general commander, July 2, 2008[28]

"IF OUR ENEMY IMPOSES LIMITS ON OUR OIL [EXPORTS], WE CAN ANSWER IN KIND, USING OUR OTHER CAPABILIT[IES]."

—Gen. Mostafa Izadi, former acting chairman of Iran's Armed Forces General Staff, June 24, 2012

"AMERICANS AND WESTERNERS LABELED OUR ACTIVITIES 'GUERRILLA WARFARE' TO CONTRAST IT WITH THEIR OWN 'CLASSIC WARFARE,' WHICH IS NOT TRUE. WE HAVE DEVELOPED A FULLY CLASSIC CAPABILITY TAILORED TO OUR REQUIREMENTS. WE DON'T PLAY BY THEIR RULES. INSTEAD, WE FORCE THEM TO PLAY BY OUR RULES IN OUR BACKYARD."

—Cdre. Ali Fadavi, former IRGCN commander

Iran makes no secret of its desire to be recognized as the dominant military power in the Persian Gulf and the Strait of Hormuz, and the guarantor of the world's energy security. Ironically, being the "policeman or gendarme of the Persian Gulf" is not a new aspiration, and Iran had been associated with the notion since the 1970s. Throughout its revolutionary history, the Islamic Republic has traditionally been eager to frame, and indeed denounce, the former shah's role as policeman of the vital oil-transit route. Yet despite these efforts, the Iranian leadership and military commanders have lately sought to rebrand and once again promote their role as gate guard of the Gulf.[29] Contrary to the prerevolutionary period, though, Iran today sees its interests in the region in direct conflict with those of the West.

Since the 1979 revolution, the Islamic Republic has seen itself as a consistent target for outside actors. But only in 2012, the start of the previous round of sanctions, did top Iranian leaders outline an aggressive, consequential retaliatory strategy called "coercion for coercion," an approach that relies on occasional coercive IRGC military drills in response to coercive foreign threats, thereby demonstrating the Guard's capabilities to the world. This leads to the question of what specific coercive tools Iran possesses, and how it might attempt to use them.[30] A leading tool providing leverage is the oft-threatened disruption or cutoff of oil through the Strait of Hormuz. Given that the 2017 share of global crude exports from the Middle East reached 42 percent at 18.7 mb/d, according to OPEC statistics, this threat cannot be taken lightly.

Never elaborated was how the Guard's self-declared "smart control" of the strait fits Iran's coercive strategy outlined at an IRGCN conference in July 2012.[31] This doctrine could render a new twist in Iran's influence over Gulf shipping by denying innocent passage to—for example—tankers from countries that actively participate in imposing new sanctions on Iran, or confront Iran's interests in the region militarily. Such action, however, would be high-risk and could quickly escalate into a regional military confrontation, given that it would directly challenge freedom of navigation protected by UNCLOS and enforced by an international coalition. Moreover, any "control" of traffic through the narrow strait shipping corridors requires an extensive, high-profile naval and air presence unless established using nonattributable coercive measures. Iran can replace the air component with robust air defenses, which despite being an upgrade would remain vulnerable to the coalition's extensive suppression and/or destruction of enemy air defense (SEAD/DEAD) capabilities, spearheaded by standoff weapons and stealth aircraft.[32] Nevertheless, as noted before, the IRGC has so far managed to return to service a squadron of ten ex-Iraqi Sukhoi Su-22 strike aircraft with several claimed features—including a "future" ability to carry multi-mode-guided cruise missiles with 1,500-kilometer range (perhaps of the same type used to strike at Saudi Aramco targets in September 2019) and to receive targeting data from UAVs—which if true and used effectively could improve the Pasdaran's reach and first-strike capability against standoff targets as far away as the Horn of Africa. But they too would be subjected to coalition counterair measures and quite possibly cease to pose any threat after a few days. In the more distant future, such programs could potentially take shape as a networked loitering attack weapon system with online track planning to detect, surveil, strike, and assess stationary and moving targets.

Enforcing overt kinetic restrictions on maritime traffic through the Strait of Hormuz will not be as easy as it appears, and to sustain operations farther from their shores and bases, IRGC assets will have to burn through a formidable opposition in the form of the U.S. military. In doing so, Iranian forces possess several effective means, such as mobile long-range guided missiles and high-speed attack boats. In a future engagement, however, unlike the 1987–88 period, Iran might not be able to contain the consequences, and could instead attract a resolute response that extends beyond its offshore targets. This leaves Iran with few favorable force-on-force scenarios. In addition, any direct missile threat against ultra or very large crude carrier traffic could put Iran's entire oil export infrastructure at risk for retaliation, jeopardizing the country's main source of revenue and links to world markets. Therefore, while Iranian forces can "close" the strait via sustained harassment and mining, the overall cost will far exceed what Iran can stand, and it could lead to the Islamic regime's total collapse. This is why, short of extreme scenarios, Iran is unlikely to ever attempt to block strait shipping altogether. Any rhetoric out of Tehran suggesting such an intent likely does not reflect official policy. On the other hand, the events of spring and summer 2019, triggered by the U.S. maximum pressure policy, suggest extreme scenarios are not entirely far-fetched. Triggered by a major Western embargo or total blockade of Iranian ports or oil exports, Tehran could start a regional war, knowing that achieving its outstanding interests lies in causing "serious trouble."[33] Moreover, the Iranian regime's interests extend beyond its borders, and Iran's navies could also seek to disrupt shipping in the strait and beyond to forestall a perceived imminent threat against its "national and revolutionary interests" in the wider region.[34]

Despite its contemptuous rhetoric, Iran has generally preferred to use proxies and other indirect means to strike at the United States, rather than direct, open confrontation. This precedent would suggest Iran's initial approach to influencing Gulf shipping could be more indirect, possibly taking the form of disguised attacks—through mines and nighttime pirate-like attacks on tankers—designed to drive up insurance rates and unnerve ship owners and crews. Other scenarios can also be envisaged within the Hormuz security framework and Iran's expanded regional role, ranging from a limited or targeted disruption of navigation in and out of the Gulf, in Bab al-Mandab, for example, to a full-blown preemptive strike by Iran in response to specific regional developments.

Historically, the IRGC has also tended to overlook its opponents' ability to adapt, such as when the United States waged guerrilla-style warfare of its own in 1987–88. Although more recent captures of British and U.S. Marines fail to illustrate this point, Iranian asymmetric warfighters have succumbed in the past to a resolute and innovative opponent, such as during Operation Earnest Will. Tellingly, IRGCN activities during the Iran-Iraq War constitute a rare aspect of that conflict to receive little attention in official

Iranian military histories, and when mentioned, they are treated with a mixture of fact and fiction. In recent years, Iran has frequently mixed real military capabilities and highly publicized field exercises with coercive rhetorical threats originating from unofficial or quasi-official sources. Such rhetoric was often designed to boost Iran's deterrence posture and reinforce its position of authority in the region. All this said, the IRGC may choose to ignore historical lessons based on misjudging the adversary, or it may be ready to engage in extraordinarily risky behavior. Nor should one lose track of the ongoing buildup of preparedness and confidence among Iran's revolutionary inner circle.

NOTABLE IRANIAN ACTIONS IN THE GULF

An early unsuccessful Iranian attempt to attack Saudi oil infrastructure in the Persian Gulf occurred in October 1987, a little more than two months after Saudi security forces killed hundreds of Iranian pilgrims in Mecca on July 31. After much deliberation, Iranian leaders decided to destroy at least some of the thirteen offshore platforms and onshore pipelines at the joint Saudi-Kuwaiti Khafji oil field (300,000 bpd), using swarms of armed speedboats in a measured retaliation.

Preparing for this operation took the IRGC two months, inaugurated in August 1987 by its first major naval exercise in the Gulf. Named "Shahadat" (Martyrdom), the exercise had a strong public relations element, with even foreign reporters invited to watch. It involved more than a hundred armed speedboats and lasted three days. On the culminating day, August 6, then president Ali Khamenei oversaw the proceedings and ordered an explosive boat to ram a target ship near the strait. IRGC seamen, in a public show of force, also demonstrated their ability to attack ships in swarms with rockets, dispatch both unmanned and manned explosive boats—the latter operated by martyrdom-seeking crews doing mock attacks—lay mines, and assault offshore facilities. But the actual exercise, to be disguised by a Martyrdom II "exercise" in the northern Gulf, was thwarted before it began on October 3 by a combined U.S.-Saudi show of force. Iranian leaders and military commanders had gravely miscalculated the U.S. ability to detect, and its resolve to deter, such an operation before it could achieve its objectives.

In the context of its war with Iraq, Islamic Republic consistently sought during the late 1980s to avoid drawing in U.S. forces, which the United States interpreted as a sign of "prudence" and "self-interested restraint."[35] This strategy, however, also played into Iraqi hands by permitting a vicious circle of attacks and counterattacks against neutral shipping in the Persian Gulf, and drawing superpowers even further into the conflict. At the time, Iranian leaders demonstrated a propensity for ill-advised decisions, which only halted with the acceptance of a ceasefire with Iraq on July 18, 1988.

In a future confrontation with the United States, Iran could act with restraint—to avoid escalating the conflict in a way that would play to U.S. strengths in waging mid- to high-intensity warfare—by employing discreet tactics such as covert minelaying and limited submarine operations. Dress rehearsals for just such an operation periodically take place in the context of the IRGCN's almost-annual "Great Prophet" exercises.[36] The grave risk would be that, as happened during the Iran-Iraq War, the Iranian indirect attacks have the exact effect the Islamic Republic is seeking to avoid—namely, dragging the United States into a military conflict.

In a worst-case conventional "end game" scenario, Iran would likely seize the initiative from the West, and from Israel, by initiating a chain of provocative incidents aimed at luring its enemies into launching premature and poorly defined strikes or, in the most extreme case, preempting the United States or Israel militarily.[37] Alternatively, as shown in the spring 2019 developments, Iran could opt for controlled escalation using bold yet unattributable methods. Given that the attacks against tankers in the Persian Gulf approaches were apparently in retaliation for not-yet-fully-disclosed covert actions against Iran's tanker traffic in the Red Sea, it can only be speculated what geopolitical developments may entice Iran's leaders to choose preemptive action, which under the Shia law of warfare is allowable under specific circumstances. Still, Iranian clerical leaders can always justify preemptive action as defensive jihad, having in mind their repeated declarations that the "infidel enemy" has already been waging a hybrid war against them.[38] Added to this is growing confidence among certain hardline factions of the Iranian leadership and Guardsmen that the West is too worn out to react to a serious challenge that could eventually end the Western presence in the region, if not seriously undermine its international leadership role.[39]

In that case, Iran could theoretically launch a coordinated attack involving explosives-laden remote-controlled boats and remotely operated underwater vehicles, swarming speedboats, semisubmersible torpedo boats, kamikaze UAVs, midget attack submarines, and shore-based antiship missile and artillery fire, all concentrated on a coalition-escorted convoy or surface-action group approaching or transiting the Strait of Hormuz. As repeatedly exercised in the Gulf, barrages of rockets with cluster warheads could be used to suppress enemy defensive fire and disrupt its carrier operations. This scenario, however, could bring unforeseen consequences, forcing the United States to respond in kind, at great peril to the Islamic regime. As demonstrated in the events of early 2020, however, Iran

will try to carefully manage the escalation and will shy away from inflicting human casualties, which could draw a kinetic response to its aggressive actions.

On the other side of the escalation spectrum, Iran can officially declare under international laws withdrawal of the right of transit/innocent passage for certain groups of naval vessels or individual ships, and set up inspection points and defensive lines at the approaches to the strait just outside the Gulf.

Back in 2002, a war game conducted by the U.S. military, called Millennium Challenge, revealed a serious fleet vulnerability to well-coordinated attacks by ballistic and cruise missiles and swarming speedboats in littoral waters, which here caused "the worst [simulated] naval defeat since Pearl Harbor."[40] Thereafter, Western militaries studied the concept of "net-centric" and later "hybrid" warfare in the maritime domain, especially against swarm attacks, and expect familiarity with this concept—which stems from information advantages on the battlefield—to help reduce, if not eliminate, their vulnerability.[41] In the past several years, a range of newer tactical concepts, systems, and algorithms has been developed to counter swarms of speedboats.[42] Net-centric warfare has thus been joined by other concepts such as the "outside-in" operational concept, which proposes initial operations against Iran from outside the reach of its antiaccess threats.[43]

In recent years, the Iranian national navy has developed a blue-water strategy focused on "defending in depth, advancing Iran's political and economic interests, and protecting Iran's sea lines of communication."[44] Such a capability, however, requires an advanced navy equipped with well-trained personnel as well as modern warships and support vessels that have sufficient offensive, defensive, and intelligence-collection capabilities and seafaring endurance to support such missions down to the declared limit of the 10th parallel north and beyond. Such missions would also require foreign port access.

Between 2009 and 2018, to maintain a rotating presence in pirate-infested areas of the Gulf of Oman and Arabian Sea, up to fifty-seven Iranian naval task groups—normally consisting of two to three warships and support vessels—have sailed across the Gulf of Oman, staying anywhere from a week to a half year (see Appendix E, "IRIN's Long-Range Task Forces and Naval Visits Abroad"). Such "antipiracy" missions also serve intelligence-collection and training purposes.

During this period, Iranian navy ships on a few occasions traveled as far as China, the South African port of Durban, and Syria (through the Suez Canal), journeys that at least once have been disrupted by technical problems. Such glitches highlight the IRIN's significant shortcomings in assuming a true strategic role beyond the Arabian Sea, a situation that has not been improved by the construction of a few missile boats (Sinah-class) and frigates (Mowj-class) weighing up to 1,300 tons.

While the IRIN still lacks a viable blue-water navy and can carry out sustained operations only in the Arabian Sea and Red Sea at best, it also sends its units on occasional longer-range missions and is showing an ambition to undertake more of these. To rectify its blue-water shortcomings, the Iranian navy's shipyards and the new Naval Industries Organization of the Armed Forces (NIO) are planning to build bigger oceangoing ships, including through the preliminary Negin project, which envisions design of a 5,000–7,000 ton destroyer class complete with a vertical missile-launching system.[45] The NIO is a Defense Ministry entity established in January 2019 to unite and oversee all naval R&D and production activities pertaining to surface and undersurface vessels, subsystems, and naval weapons.[46]

POSSIBLE TARGETS

In reaction to a limited military action against its territory, Iran can be expected to use its partial control of navigation through the Strait of Hormuz to stop and inspect shipping, and to deny certain countries the right of passage. Needless to say, any such outcome could escalate into an all-out hot confrontation with the United States in and around the strait, a fear heightened by the events in spring and summer 2019.

If the situation in the Gulf region does become a larger, military confrontation, the region's congested oil facilities will be very vulnerable. But in an effort to manage any such escalation, Iran would most likely only directly attack key Gulf Arab oil facilities if its own oil facilities were somehow targeted or if it were seeking revenge for other countries' complicity in undermining the Iranian economy. Even then, any Iranian military action would likely focus initially on oil transit infrastructures, including tankers. The Aramco attacks and the strikes preceding them corroborate this view, but they also show that Iran will not hesitate to send the strongest possible message through strikes on an enemy's critical oil infrastructure, if it can avoid attribution. The following are hydrocarbon targets most susceptible to disruptive attacks (and see table 4):

- offshore oil wells and gas-oil separation platforms
- pipelines, including the Saudi Petroline and a revamped former Iraqi Pipeline in Saudi Arabia (IPSA), as well as the UAE's brand-new Habshan–Fujairah pipeline, which bypasses the strait
- pumping stations

- storage facilities and terminals, including the largest floating storage and offloading (FSO) supertankers in the world—FSO Asia and FSO Africa—currently moored at Qatar's al-Shaheen offshore oil field

- LNG liquefaction facilities, with more than half of the Persian Gulf's petroleum exports passing through only a handful of vulnerable terminals, and Qatar's Ras Laffan terminal—only about 120 miles (190 km) from Iran's Lavan Island—handling the world's largest LNG export operation.

Oman is also developing its large-scale Duqm port city project on its Arabian Sea shores. Duqm would be an indispensable naval and air base for any outside force vis-à-vis Iran, given its particular distance from the Iranian coastline, between 410 and 435 miles (660–700 km). This sets Duqm beyond the range of many current Iranian weapons capable of inflicting any serious damage on carrier groups, except the latest Dezful and Hoveizeh missiles, yet close enough for U.S. naval aviation to launch surprise airstrikes against targets in and around the Strait of Hormuz with some serious loitering time. That would help ease some of the range concerns within the United States, too, regarding the Lockheed F-35C.

The majority of oil shipments out of the Persian Gulf originate from the Ras Tanura (5.5–6 mb/d capacity) and Ras al-Juayma (3–4 mb/d capacity) terminals in Saudi Arabia—notwithstanding Iran's Kharg Island—which in turn depend on vital links such as pipeline manifolds and pumping stations for the unhindered flow of oil. Saudi Arabia also depends on a single processing facility at Abqaiq (known locally as Buqayq), west of Dhahran, to pump 6.8 mb/d of oil—almost 90 percent of the kingdom's crude exports—to its export terminals.[47] Robert Baer, a former U.S. Central Intelligence Agency officer in the Middle East, calculated that at the very least, a successful attack on Abqaiq would slow output from its current 6.8 mb/d to about 1 mb/d for two months, and by a continuing 40 percent under capacity through seven months after the attack. The Saudis, however, have made the Abqaiq facility highly redundant, and in the event of a successful attack against one area of the facility, output can be maintained by shifting the processing to other areas.[48] Global spare oil capacity has also increased in recent years, with OPEC alone having a spare capacity of 3.3 mb/d, according to the International Energy Agency. Together with a current abundance of emergency stocks of more than 2 billion barrels, U.S. shale oil supplies, and lower oil demand, a major economic crisis can be avoided for a limited period amid the loss of 5 or 6 million barrels a day. The September 14, 2019, cruise missile and drone attacks against the Abqaiq and Khurais oil facilities meanwhile exemplified how seriously a well-planned and executed operation can disrupt Saudi Arabia's oil production. Saudi Aramco announced it planned to restore about one-third (2 mb/d) of lost oil output (5.7 mb/d) within two days after the attack.[49]

Second in importance to Saudi Arabia as a potential target are its strategic water desalination plants. Saudi Arabia is the largest producer of desalinated water in the world, using thirty-two plants, of which six are located on the kingdom's east coast. The Jubail seawater desalination plants—Jubail Phase 1, Jubail Phase 2 multi-stage flash evaporation, and Jubail reverse osmosis—are run by the state-owned Marafiq utility and located along the Persian Gulf coast. The world's largest thermal desalination plant at Ras al-Khair, located some 47 miles (75 km) northwest of Jubail, produces 1.025 million cubic meters of water per day. Together, the Saudi plants produce 90 percent of the kingdom's drinking water, with little backup; their destruction would force total evacuation of Riyadh within a week.[50] The desalination industry is also very energy reliant, reportedly consuming about 25 percent of Saudi Arabia's oil and gas production.

Disabling any of the facilities just mentioned for any meaningful period would arguably require substantial effort and numerous aimpoints. But as demonstrated in recent years, including in the 2019 attack against the Abqaiq and Khurais oil facilities, Iranian standoff weapons are improving in their both range and accuracy. Iran could also exercise the option of attacking those facilities using local terrorist sleeper cells and other asymmetric means.

While the most suitable weapons for neutralizing gas-oil separation platforms will be rockets or missiles with sub-munitions dispensing or else armor-piercing incendiary warheads, the main shore manifolds and pipelines could also be targeted by autonomous craft, or boats manned by special operations forces or local terrorist sleeper cells. Against terminals and processing facilities, both cruise and ballistic missiles such as Raad and Fateh-110/Khalij-e Fars missiles and upgraded Zelzal rockets could be used. Main aimpoints could include loading arms, power plants, heat exchangers, and control rooms. Iran might also attempt to covertly mine the shipping lanes as far away as the Mediterranean using ostensibly civilian vessels.

In 1984, Libya mined the Red Sea—including sea lanes near the Saudi port of Jeddah—and Gulf of Suez using a specially modified cargo ship,[51] and probably inexpensive mini-submarines. Those actions are widely believed to have been requested by and coordinated with Iran, and have since been used as template for Iranian proxy relations everywhere from Lebanon to Yemen.

Until the dawn of the 2010s, Iran was generally believed to lack the ability to significantly reduce Saudi Arabia's oil production using ballistic missiles alone.[52] While it is true

TABLE 4. VULNERABILITIES OF POTENTIAL CRITICAL INFRASTRUCTURE TARGETS

POTENTIAL TARGET	VULNERABILITY	RESILIENCY	RISKS	POSSIBLE WEAPONS OF CHOICE
Offshore oil wells	Wellheads; riser pipelines; reliance on shore facilities	Relatively small size, making them difficult targets; equipped with often-working shutoff valves	Oil spills; well blowout and sustained fire	Limpet mines; explosive-laden UAVs or drone boats or submersibles
Onshore oil-production fields		Small and scattered in featureless desert	Major smoke from well fire	Precision-guided ballistic missile; cruise missile
Gas-oil separation platforms	Highly flammable; reliance on offshore well platforms and on shore facilities; riser pipelines; crew-accommodation area; outdated computer systems	Fairly large amount of explosives needed to significantly damage an offshore platform	Release of hazardous sulfur; shooting down of service helicopters	Limpet mines; standoff cluster munitions; explosive UAVs or drone boats; guided antitank missiles; cyberattack
Onshore pipelines and manifolds	Pipeline integrity; hubs and interchange terminals; susceptibility to cascade failure	Two-way nature of most new pipeline networks, with sophisticated fault-detection and shutoff mechanisms	Release of hazardous and highly flammable materials; fierce fires	Precision-guided munitions with cluster warheads; sabotage; cyberattack
Submarine pipelines	Pipeline integrity; susceptibility to cascade failure	Difficult to detect and locate; two-way nature of most new pipeline networks, with sophisticated fault-detection and shutoff mechanisms	Large-scale oil spill	Divers with limpet mines; midget submarine and remotely operated vehicle; aerial bombs with delayed fusing
Oil/gas- and water-pumping stations	Sensitive turbines/ compressors; electrical power needed to run compressors	High degree of redundancy	Catastrophic failure that stops the flow of oil	Precision-guided weapons
Storage tanks	Exposure of large tank farms; empty and full tanks easy to distinguish	Measures in place to reduce spread of large fires	High concentration of crude and refined product	Projectile attack
Fixed loading terminals	Control rooms and metering stations; loading arms; loading berths and anchorages vulnerable to mining and submarine attacks	High redundancy, with numerous berths and loading arms; could be hooked up with flexible hoses and single-point moorings	Easy targets from afar	Ramming explosive boats and UAVs; precision-guided weapons; sea mines; submarines

POTENTIAL TARGET	VULNERABILITY	RESILIENCY	RISKS	POSSIBLE WEAPONS OF CHOICE
Single-buoy mooring (SBM) /single-point mooring (SPM) and floating storage and offloading (FSO)/floating production storage and offloading (FPSO) units	Collision	Can be dismantled and relocated	Oil spills	Ramming explosive boats; precision-guided munitions
Port facilities	Difficult perimeter defense	Difficult to target because scattered elements of a port facility make them difficult targets	Disruption to flow of vital goods	Area weapons; precision-guided munitions; terrorist and cyberattacks
Crude carriers	Big and slow; not all can be escorted; confined to deep waters as a loaded VLCC has a draft in excess of 20 m	Double-hull construction makes incapacitation difficult; crude oil is difficult to ignite	Oil spill and fire	Explosive-laden boat; large antiship missiles and rockets
Product carriers	Big and slow; not all can be escorted; oil products are highly flammable despite fire-suppression measures	Double-hull construction makes incapacitation difficult	Oil spill and fire	Explosive-laden boat; antiship missiles and rockets
LNG facilities and tankers	Tankers and facilities highly visible and easily identifiable; highly combustible despite limited area of influence; risk of cascading failure of adjacent storage tanks; loss of water supply and electric power shuts down LNG operations	Limited risk of high-energy vapor explosion rather than burning of gas vapors within a limited area; double-hulled gas tankers are robust	Risk of "flameless explosion" if spilled on water; spills can cause significant injury and damage; cryogenic damage since LNG is transported at much lower temperatures	Projectile attack; terrorist attack; cyberattack
Petrochemical and other process plants	RMP sites; highly flammable; hazardous chemical storage tanks; limited capacity storage; leakage of toxic materials; disruption to production; security lapse	Redundancy and fault tolerance; extensive use of isolation valves and automatic shutdown systems	Release of large volumes of highly hazardous chemicals such as chlorine, peroxides, and hydrogen fluoride	Projectile attack; terrorist attack; cyberattack
Power plants and grids (generation, transmission, distribution)	Highly dependent on supply of natural gas as feedstock; very susceptible to kinetic force; energy control centers; heavily loaded networks are less vulnerable to disturbances	Contingency redundancies and protective relays; high-voltage transmission lines are scattered and difficult to target	Electrical surge; power blackouts	Graphite bombs; EMP weapons; cyberattack

TABLE 4. VULNERABILITIES OF POTENTIAL CRITICAL INFRASTRUCTURE TARGETS (CONTINUED)

POTENTIAL TARGET	VULNERABILITY	RESILIENCY	RISKS	POSSIBLE WEAPONS OF CHOICE
Oil/condensate refineries	Distillation and cooling towers; isomerization units (increase gasoline octane); continuous catalytic reforming (CCR) units, which produce premium blending stocks for high-octane gasoline; power-generation and cooling water/ steam-production units; control systems; shortage of feedstocks	Some degree of redundancy	Major fire and explosion hazard	Precision-guided weapons with large warheads; sabotage; cyberattack
Water desalination plants	Highly dependent on power supplies; extensive delivery networks; located close to shorelines and within the range of Iranian antiship cruise missiles; vulnerable to oil spills	Relies on a network of integrated plants and pipelines to create redundancy	Water deprivation. Loss of a mega-desalination plant can cause significant social dislocation and political instability	Precision-guided weapons, including cruise missiles; offshore oil spills
Submarine voice and data cable nodes and landing stations	Difficult to locate and repair in contested areas; landing stations highly vulnerable to attack; alternative routes often do not have enough capacity to handle increased traffic load; fiber, switching/ network control equipment, power supply; landing station very vulnerable	Alternative routes are often installed to increase system reliability; localized damage to fiber optic cables is generally easy to repair; networks' "self-healing" ability allows bypassing of damaged nodes and paths	Major disruption to the world's financial centers; multiple simultaneous attacks on primary fiber paths can cause widespread data outages	Submarines and remotely operated vehicles; sabotage
Control rooms and facilities	Supervisory control and data acquisition (SCADA) systems vulnerable to cyberattack; relatively easy to identify	Difficult to disable if hardened and built with redundancies	Major system disruption	Precision-guided weapons; sabotage

that oil and gas infrastructures, including Arab examples in the Gulf, are inherently resilient and designed with significant redundancies and excess capacity, Iran is believed to have made steady progress with its missile accuracy, if not reliability, and destructive power in recent years. Taking the Fateh family of missiles as an example: since 2010, its range has been increased from 250 kilometers to over 750 kilometers, with likely significant improvements in accuracy as well. Watching the performance of Khalij-e Fars and Zolfaqar versions during the Great Prophet 9 exercise in 2015 and during strikes in Syria (2017) and the Kurdistan Region (2018) indicated accuracy sufficient to hit key oil and gas targets such as control rooms, manifolds, pumping stations, and LNG trains, causing considerable damage with their blast warheads. Iran might improve further on these performance capabilities if the Fateh Mobin missile, claimed to have pinpoint accuracy using a day/night electro-optical seeker head, enters service.[53] In addition, another newly unveiled missile of the Fateh family, Dezful, with a claimed range of 1,000 kilometers and a powerful warhead, could strike Saudi military and economic targets even farther west than existing missiles. Finally, as demonstrated during the Abqaiq and Khurais strikes, Iran can use cruise missiles and explosive-laden UAVs—which fly low and are hard to detect by radar—to great effect against exposed oil facilities, either directly or through third-party territories.

INTENTIONS

On July 19, 2017, then IRGC commander-in-chief Gen. Mohammad Ali Jafari warned Washington that if it proceeded with more aggressive sanctions against Tehran, U.S. forces should pull back its regional bases by at least a thousand kilometers.[54] Such threats are repeated with almost annual frequency.[55] They show Iran is ever more confident of its progressively longer-range precision-guided ballistic and cruise missiles.

Over a decade ago, during the 2006 war in Lebanon, Tehran drew what it perceived as a core lesson on the merits of preemptive action, relating to its proxy Hezbollah. Specifically, Tehran believed that Hezbollah's kidnapping and killing of Israeli soldiers actually preempted an upcoming large-scale Israeli and American military attack against the group and, ultimately, Iran itself.[56] Along these lines, the IRGCN for years has been helping Hezbollah build up a nascent naval capability with shore-based antiship missiles, speedboats, and special naval operatives. More recently, in early 2018, a UN Panel of Experts on Yemen documented evidence pointing to Iranian involvement in providing Yemeni Houthis with arms, in addition to components and expertise to manufacture or assemble weapons, including limpet and bottom-laying sea mines and explosive autonomous craft.[57] The UN Panel of Experts, however, could not positively verify the type of antiship missile that struck an Emirati Swift-1 naval support ship in October 2016, despite numerous reports identifying it as a C-802/Noor.[58] Iran and Hezbollah are generally suspected of helping Houthi Shia in Yemen with arms and technical know-how to use antiship weapons in their fight against the Saudi-led coalition.

It is no secret that Tehran's ultimate aim is to expel U.S. and Western influence not only from the Persian Gulf region but from the entire Middle East. According to Gen. Masoud Jazayeri, a former deputy chairman of Iran's Armed Forces Joint Staff, the ultimate objective of the grand resistance front is "to destroy the Zionist regime and to drive every American soldier out of the region."[59] In seeking this goal, the IRGCN has long worked to undermine the U.S. naval presence in the Persian Gulf by assuming a self-declared and potentially problematic role as protector of security in the Hormuz Strait and larger Gulf,[60] a position first publicly unveiled in 2008.[61] The IRGC has, in turn, sought to ensure that Iran's naval capability makes a major appearance in U.S. threat assessments. Alongside the IRGCN role in Hormuz, the Guard seeks to achieve this visibility through heated rhetoric, highly publicized military maneuvers, and actions such as the occasional capture of foreign military personnel or harassment of U.S. warships in the Gulf. This trend is highlighted by near-annual military maneuvers, in which the IRGC rehearses the strait's closure using missile boat operations, attacks by shore-based antiship missiles, and concentrated long-range artillery and rocket fires.[62] In more recent years, "Great Prophet" exercises have been scaled back, instead taking the form of "security drills." Such maneuvers are planned in cooperation with the IRGC's defense propaganda and psychological operations command, which is now strengthened under Brig. Gen Jamaleddin Aberoumand in what is called "Soft War Headquarters." This shows how the exercises are just as much displays of Iran's psychological warfare as of its military capability.[63]

CONCLUDING REMARKS

Given the industrialized world's dependence on oil imports from the Persian Gulf, even minor disruptions in the flow of petroleum and LNG from the region will seriously strain the market, potentially with far-reaching economic consequences. Such vulnerability, together with Iran's geographical position astride the Hormuz chokepoint, gives the Islamic Republic some leverage over the world's big economies. At the same time, Iran's own shaky economy, crippled by reimposed U.S. sanctions from the maximum pressure policy, is still dependent on the free flow of navigation through the Strait of Hormuz. So as long as Tehran's

economy uses the strait, its primal concerns in the region will remain defensive in nature.

Furthermore, Iran remains a country keen on exporting its revolution, expanding its regional influence, and spreading its values, utilizing every tool at its disposal, including the IRGC and its regional proxies, to do so. And while the national navy has more or less retained its secular substance despite the appearance of appointed commanders obliged to maintain a religious front and discourse, the Guard's navy is known to be the most zealous force even within the IRGC. This serves as a reminder that despite its dominant role in the military, security, economic, intelligence, and sociocultural spheres, the IRGC is fundamentally a "theo-political" body committed to *velayat-e faqih*, as long as this concept remains enshrined in the national constitution.

The Iranian leadership, notwithstanding the country's dire economic situation, is increasingly confident of its ability to inflict severe winning blows on enemy forces. As a result, one cannot dismiss the possibility, even if remote, that a radical shift in Iran's executive branch, such as Rouhani's ouster, coupled with rising cachet among regime hawks and other geopolitical developments, could lead to a decision for preemptive attacks if an enemy movement is interpreted as preparation for war. As part of this effort, and also to respond more effectively to outside attack, Iran has greatly expanded the IRGCN's role and offensive prowess, including its ability to widen and intensify any conflict and to project Iranian power in this strategic context. Iran has amassed a large arsenal of specially developed modern weaponry—most of it domestically produced and based on foreign technology—for defensive as well as offensive purposes.

Today, Tehran's rhetoric and actions indicate that its defensive threat-centric asymmetric posture is giving way to an offensive "target-centric" paradigm aimed at disrupting the status quo in the Gulf region and beyond. Armed with modern weaponry, Iran could generate destabilizing and unpredictable results by carrying out its brand of asymmetric warfare. The IRGCN's assertion of dominance in the Persian Gulf and Strait of Hormuz were highlighted by the events from May to September 2019, but even in the Suez Canal or as far away as the Strait of Malacca, further tensions and confrontations involving the IRGC, the U.S. Navy, and U.S. regional partners cannot and should not be ruled out. At the same time, asymmetric tactics have their limits against a more powerful adversary like the United States, which enjoys a vast technological advantage, is capable of employing similar tactics and techniques, and can make its own unpredictable moves. Iranian leaders should also be reminded of their costly past mistakes. In the 1980s, the Iranian mantra was, "If the Persian Gulf is not safe for us, it will not be safe for anyone." This rhetoric did not deter other actors from seeking their interests then, and it will not do so today, either.

Yet in recent years, diminishing Western deterrence in the Persian Gulf region has emboldened the IRGC to claim supremacy, as was demonstrated on June 19, 2019, when a U.S. Navy RQ-4A BAMS-D surveillance drone was shot down by an Iranian antiaircraft missile either just inside or just outside Iranian territorial waters. This and the earlier incidents of May 12 and June 13, occurring as Iran suffered the economic effects of the U.S. maximum pressure policy, point to a pushback strategy in preparation for a major, yet measured, escalation. Either Iran was behind the tanker attacks or not—more likely the former—but the crisis spurred Western powers to increase their naval presence and protective activity in waters normally patrolled by Iran, risking an increase in tensions with the IRGC.

NOTES

1 The IRGC does not recognize the international name given to it, nor its acronym, preferring "Sepah"; it also generally avoids abbreviating its branch names in English.

2 See Farzin Nadimi and Michael Knights, "The Hodeida Campaign (Part 3): Deterring Houthi Retaliation," PolicyWatch 2970, Washington Institute for Near East Policy, May 16, 2018, https://washin.st/2TJE94B. Saviz, which was removed from the U.S. Treasury Department's sanctions list in January 2016, following completion of the JCPOA, is currently owned by Oghianous Khoroushan Shipping Lines Co./IRISL, based on Kish island and operated by the Rahbaran Omid Darya (ROD) ship-management company.

3 See the program's official website at https://farmande.tv/.

4 Islamic Republic News Agency, "We Monitor All Movements of the Extraregional Forces in the Persian Gulf," March 8, 2014, http://www.irna.ir/fa/NewsPrint.aspx?ID=81077850.

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7 Hughes Jr., *Fleet Tactics*, 165.

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11 Amena Bakr, "Indian Fishermen Say U.S. Boat Fired without Warning," Reuters, July 17, 2012, https://reut.rs/30fKG6R.

12 For open-source studies of critical-infrastructure vulnerability in the Persian Gulf, see Robin Mills, *Risky Routes: Energy Transit in the Middle East*, Doha Center Analysis Paper 17 (Washington DC: Brookings Institution, 2016), https://brook.gs/2FkFndQ; Ali Al-Ahmed, Andrew Bond, and Daniel Morillo, *Security Threats to Saudi Arabia's Oil Infrastructure* (Washington DC: Institute for Gulf Affairs, 2013), http://bit.ly/2HsKue9; and Amory B. Lovins and L. Hunter Lovins, *Brittle Power: Energy Strategy for National Security*, reprint ed. (Andover, MA: Brick House Publishing, 2001), available at http://bit.ly/2ubAXQ4.

13 Danekar, "Janghaye Gheyre Classic," 281; and Maj. Gen. Mohammad Ali Jafari, interview with *Jaam-e Jam*, June 28, 2008, www.jamejamonline.ir/newstext.aspx?newsnum=100942312993.

14 See Frederic Wehrey et al., *Saudi-Iranian Relations Since the Fall of Saddam: Rivalry, Cooperation, and Implications for U.S. Policy* (Santa Monica, CA: RAND Corporation, 2009), 32, http://bit.ly/2TUpoN3.

15 "Bahrain Says Iran Behind Oil Pipeline Explosion," *The National*, November 12, 2017, http://bit.ly/2UHHfm5.

16 Mitch Ginsburg, "How Iran Could Get Carte Blanche in the Middle East—Without a Nuclear Weapon," *Times of Israel*, August 29, 2012, https://www.timesofisrael.com/israeli-hosted-simulation-shows-how-iran-could-ruthlessly-exploit-the-worlds-over-reliance-on-saudi-oil-and-stability/; and Elias Groll, "Cyberattack Targets Safety System at Saudi Aramco," *Foreign Policy*, December 21, 2017, http://bit.ly/2Y8gTM3. For a study of conventional and unconventional threats to the Saudi oil industry, see Ahmed, Bond, and Morillo, *Security Threats*, http://bit.ly/2HsKue9.

17 "Gasoline Consumption Figures in Iran Are Now Treated as Confidential" (in Persian), Radio Farda, September 7, 2018, https://www.radiofarda.com/a/iran-gas-consumption-rise/29470279.html.

18 Ali Saidi, "Spirituality as the Mainstay of Asymmetric Warfare" (in Persian), *Payam*, no. 83 (Islamic Research Center, Summer 2007). Saidi served as the Supreme Leader's representative to the IRGC for twelve years.

19 Ibid. Also see Quran 8:65, "Al-Anfal" (The spoils of war).

20 Saidi, "Spirituality as the Mainstay."

21 Fars News Agency, "Innovation Is the Main Theme of the IRGCN's 'Taali Plan'" (in Persian), April 9, 2008.

22 "Alavi warfare" is part of the new lexicon the IRGC has developed to describe its doctrine of asymmetric warfare, which emphasizes the deterrent and warfighting value of religious belief. The IRGC's former commanding officer, Mohammad Ali Jafari, who left the job in April 2019 after twelve years, is one of the principle's main proponents. See Mehr News Agency, "I Hand Over Command of the IRGC to General Jafari at the Peak of Its Power" (in Persian), September 3, 2007, https://www.mehrnews.com/news/545828; Safavi, interview with Mehr News Agency, September 23, 2007; and Haghshenass, *Iran's Doctrine*, https://washin.st/2CmAFu2.

23 "A Brief Look at Unconventional Warfare at Sea" (in Persian), *History of War Quarterly* 2, no. 6 (IRGC War Studies Center, Winter 1995).

24 See Alireza Movahed Alavi, writing in an IRGC publication: "Asymmetric Warfare and the Effects of Cultural and Psychological Factors" (in Persian), *Psychological Operations Quarterly* 2, no. 5 (July 2004), http://bit.ly/2CsZCUG. See also Fariborz Haghshenass, *Iran's Asymmetric Naval Warfare*, Policy Focus 87 (Washington DC: Washington Institute, 2008), https://washin.st/2CmAFu2.

25 See *Basirat*, http://bit.ly/2Y4V8wU.

26 Ismail Khan-Ahmadi, "The Role of Prudence (*Basirat*) in Improving the Combat Power of the Armed Forces" (in Persian), *Basirat*, September 29, 2014, http://bit.ly/2udRwe2; and Yahya Mayar and Hossein-Ali Ramazani, "Elements and Uses of Basirat in Defense of Values and Fundamentals as Seen by Imam Khamenei" (in Persian), *Basij Strategic Studies Quarterly* 15, no. 57 (Winter 2013).

27 For a comparison of Alavi and asymmetric warfare, see Alavi, "Asymmetric Warfare."

28 Fars News Agency, "IRGC Tackles Threats by Preparing and Surveilling," July 2, 2008.

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32 Farzin Nadimi, "The Counterintuitive Role of Air Defense in Iran's Anti–Status Quo Regional Strategy," PolicyWatch 2748, Washington Institute for Near East Policy, January 11, 2017, https://washin.st/2Y5g3jn.
33 In the words of Maj. Gen. Hassan Firouzabadi, former armed forces chief of staff, "We have laid out plans to close the Strait, but only when our interests are under serious threat." See Fars News Agency, "We Will Close the Strait of Hormuz if Our Interests Are Threatened" (in Persian), July 7, 2012.
34 Fars News Agency, "We Will Use Every Means at Our Disposal to Strike Back at the Enemy" (in Persian), February 21, 2012.
35 "The Persian Gulf: Implications of a U.S.-Iranian Confrontation," CIA SNIE 34-87, August 1987 (declassified in 2006), 12, https://www.cia.gov/library/readingroom/docs/DOC_0005557215.pdf.
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37 See, e.g., Fars News Agency, "We Will Deal with the Americans in a Whole New Way if They Do Not Change Their Attitude" (in Persian), November 11, 2011, http://www.farsnews.com/printable.php?nn=13900820000392; and Fars News Agency, "The Strait of Hormuz Is Part of Our Defensive Geography" (in Persian), January 1, 2012.
38 Zahed Hashemianfard, *Principles and Requirements for Defensive Jihad* (in Persian) (Tehran: Supreme National Defense University, 2010); chapter 2 describes the concept of preemptive jihad and the types of jihad contained in Shia law on warfare.
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APPENDICES

Appendix A: IRAN'S MAIN NAVAL WEAPONS SYSTEMS

Name	Origin/Other Designation	Range (km)	Warhead Weight (kg)	Guidance	Platform	Notes
Khalij-e Fars	Fateh-110	Up to 300	450	Inertial, electro-optical (EO) terminal guidance, with a circular error probable of 8.5 m or better	Land-based, truck-launched; container-launch version possible	Unveiled in February 2011. Terminally guided version of the most accurate Iranian ballistic missile. Last known test was in March 2017, when a missile destroyed a floating barge at 155-mile range.
Fateh Mobin	Fateh-110	Up to 300	~450	Inertial, EO (image infrared [IIR]) terminal guidance	Land-based, truck-launched; seaborne container-launch version possible	First known test was a shore-to-shore launch in August 2018 from Jask missile base over the Strait of Hormuz to a test range in Iranian desert or Gulf waters over 100 miles away
"Barrage" Zelzal	Zelzal	250	30 x 17 kg (510)	Inertial	Land-based mobile platform	Reportedly armed with a cluster warhead for use against ground area targets or large ships. Future development of guided version is a possibility.
Fajr-1	Chinese type 43	8	8		Speedboats, light flatbed trucks	107 mm diameter. The range of these rockets is well beyond the 3.6 km range of the Phalanx CIWS onboard U.S. warships, but just short of SeaRAM's 9 km range.
Falaq-1		10	50			240 mm diameter
Falaq-2		10.8	117			333 mm diameter
Arash (short-range version)		12	19			122 mm diameter, used with sixteen-tube gyro-stabilized naval launchers
Arash (standard version)		21	19			122 mm diameter
Arash (extended-range version)		40	22			122 mm diameter
2S1 Gvozdika SP howitzer		21		Ballistic, laser-guided	Tracked	Can fire rocket-assisted 122 mm projectiles. This tracked gun is fully amphibious and can easily negotiate the creeks and estuaries of Iranian shorelines. Iran has also developed similar indigenous designs.

Appendix A (Continued)

Name	Origin/Other Designation	Range (km)	Warhead Weight (kg)	Guidance	Platform	Notes
Fajr-2		25	85	–	Truck-mounted, medium speedboats	
Fajr-3		45	85	Inertial	Truck-mounted tube-launched (12 rounds)	240 mm diameter. Max speed 930 meters per second (m/s). Also can reportedly be armed with a cluster warhead.
North Korean Koksan self-propelled gun		60		Ballistic	Tracked	Iran still has a few of these long-range guns, which can be used for bombarding Persian Gulf shipping channels from the mainland
Fajr-5		75	178	Inertial	Truck-mounted, tube-launched (four rounds)	333 mm diameter. Max speed 1,010 m/s. Mobile and widely deployed around the Gulf coast. Exported to proxy groups.
Fajr-5 two-stage	Fajr-5	190	175	Inertial	Truck-mounted (one round)	Booster stage separates post-launch. Reportedly can reach a max altitude of 58 km at zenith.
Fajr-5C guided	Fajr-5	75?	175?	Inertial, possible GPS	Truck-mounted, tube-launched	Unveiled in 2015, it is claimed to be the "guided" version of Fajr-5, with nose-mounted moving surfaces for terminal maneuvering. No indication of homing capability unless equipped with GPS/GLONASS. Iran states these weapons can be armed with submunitions or thermobaric warheads and controlled remotely from as far away as 20 km. For potential future adoption of laser-guidance technology on its Fajr and Falaq rockets, Iran would need additional target-illuminating systems and dedicated communications links, resulting in susceptibility to detection and jamming.
HY-2G Seersucker/ Silkworm	Styx	80	513 shaped-charge high explosive (HE)	Inertial/active radar	Coastal battery	Obtained from China and North Korea in the 1980s, it is still in IRGCN and IRIN service, reportedly with some modifications

Appendix A (Continued)

Name	Origin/Other Designation	Range (km)	Warhead Weight (kg)	Guidance	Platform	Notes
Raad	HY-2G	300	513 shaped-charge HE	Inertial, radar homing	Mobile coastal battery	Extended-range version of venerable HY-2G Silkworm, with claimed guidance system improvements with North Korean help
Ghader	C-802	200	165 semi-armor-piercing HE	Inertial, radar homing	Coastal mobile battery, fixed and rotary-wing aircraft, large naval vessels	When unveiled in August 2011, this sea-skimmer missile was reportedly already in production. Many units originally equipped with Noor system can also use Ghader missiles.
Airborne Ghader	C-802	200–220 (70)	165 semi-armor-piercing HE	Inertial, radar homing	F-4E, Mil Mi-171	A 300-km-range version is also claimed to be in the works, although the missile's actual range (for now) is believed to be no more than 70 km
Ghadir	C-803	200–300	165 semi-armor-piercing HE	Inertial, radar homing	Coastal mobile battery, fixed and rotary-wing aircraft, large naval vessels, submarines	Delivery reportedly started in November 2015; some reports suggest a version with twice the range is in development under the name Moghtader
Nasir	C-803	200–300	165 semi-armor-piercing HE	Semiactive radar, radar homing, IR	Coastal mobile battery, ship, speedboat	Entered service in April 2017; reportedly also capable of attacking shore targets; claimed to be incorporating advanced radar and electronic counter-countermeasures (ECCMs)
SM-1MR Block V	RIM-66B	18 (when operating in anti-surface mode	62 continuous rod HE	Semiactive radar homing	Surface launch from Jamaran-class frigates and Gorz fast-attack craft (missile)	A refurbished Iranian version (Mehrab), unveiled in December 2011, was also claimed to include an antisurface mode
Harpoon	RGM-84A	140	221 penet-rating blast-fragmen-tation	Attitude reference, active radar homing	Surface-launch from Kaman-class missile boats	A very limited number might still be in inventory, but not necessarily in service
Noor	C-802	120 (report-edly 70 km) when fired from F-4)	165 semi-armor-piercing HE	Inertial, radar homing	Coastal mobile battery, fixed and rotary-wing aircraft, large naval vessels	In 2006, a C-802/Noor missile struck the INS *Hanit* off the coast of Beirut, killing four Israeli sailors

Appendix A (Continued)

Name	Origin/Other Designation	Range (km)	Warhead Weight (kg)	Guidance	Platform	Notes
Nasr	C-704	35	130	Inertial, radar homing	Coastal mobile battery, small- to medium-size naval vessels, Ghadir and Fateh-class submarines (launched from torpedo tubes)	Entered service in 2010; Iran claims Nasr can sink ships up to 3,000 deadweight tonnage (DWT); 55 m/s speed; test-launched from a submerged Ghadir-class submarine on Feb. 24, 2019. In March 2011, Israel seized a cargo of 2 C-704 Nasr missiles from a shipment believed to be on its way to Hamas.
Air-launched Nasr	C-704		130	Inertial, radar homing ("fire and forget")	Aircraft (F-4, JetRanger, Su-22)	Production of air-launched version of Nasr started in 2015
Nasr-e Basir	C-704	35	130	Inertial, EO (IIR)	Coastal mobile battery, aircraft (F-4E, Su-22?), small- to medium-size naval vessels	Unveiled in 2014, the newest model in the Nasr family
Nasir	C-704	130?		Inertial, active radar homing		Sea-skimmer antiship cruise missile with jet propulsion, a separating booster, and reportedly advanced ECCM. Delivery to IRGCN started in 2017.
Kowsar	C-701	25	29	Radar, EO	Small boats, helicopters, UAV, wing-in-ground (WIG) effect	Developed in at least three versions; 274 m/s speed
Zafar radar-guided	C-701	25	30	Active radar homing	Small boats, helicopters	Unveiled in 2012
Zafar EO	C-701	25	30	Electro-optical homing	Small boats, helicopters	
Hoot	Shkval	8–10 (Iran claims up to 15 km range)	210	Inertial, line of sight	Surface vessels including speed boats, possibly even midget submarines	First tested in 2004, unveiled in 2006, and again tested in July 2008, the supercavitating rocket torpedo can achieve 100 m/s speed; according to U.S. military, Iran test-fired a Hoot from a Ghadir mini-sub near the Strait of Hormuz on May 7, 2017, ending in possible failure; another test was reported in February 2015. Smaller version might have also been developed.

Appendix A (Continued)

Name	Origin/Other Designation	Range (km)	Warhead Weight (kg)	Guidance	Platform	Notes
533 mm torpedo		18–22	300		Kilo-class submarine (up to 18 rounds)	533 mm diameter
Valfajr torpedo			220		Submarine	533 mm diameter; unveiled in Aug. 2011; suitable for use in both deep and shallow waters
Test-71? torpedo		20	205	Sonar/EO	Kilo-class submarine	324 mm? diameter, 20 m/s speed
Unknown					Surface vessels, submarines, aircraft	Torpedo; tested near Jask in November 2014
Unknown					Two modes: sub-to-sub and sub-to-ship	New advanced torpedo successfully completed tests in May 2015
Unknown		Unknown	Unknown	Unknown	Tube-launched from medium-size missile boats and possibly submersibles and even submarines	Antisubmarine torpedo missile similar to Russian RPK-7/SS-N-16; reportedly tested during Great Prophet 9 exercise in February 2015
Advanced Valfajr torpedo				Sonar/ probably radar homing	Ghadir and Kilo-class submarines	533 mm torpedo; unveiled and tested in February 2017; quick reaction time
Mk 46 Kouseh (shark)		11				

Appendix B: IRIN'S MAJOR OPERATIONAL NAVAL VESSELS

Vessel	Pennant Number	Base	Commission Year	Length (m)	Draft (m)	Reported Speed (kt)	Notes
ALVAND (VOSPER) CLASS							
Alvand	71	Bandar Abbas	1968	94.5		17 (under diesel), 39 (with gas turbine)	
Alborz	72	Bandar Abbas	1969	94.5			
Sabalan	73	Bandar Abbas	1969	94.5			Badly damaged by U.S. Navy on April 18, 1988; returned to service in 1990
JAMARAN (MOWJ) CLASS							
Jamaran (Mowj-1)	76	Bandar Abbas	2010	100			Includes French power train and gearbox/shaft; armed with Noor antiship missile
Damavand (Mowj-2); originally named *Velayat*	77	Anzali (written off, being rebuilt)	2015	100			Equipped with Iran's first phased-array radar and Ghader antiship missile; ran aground on January 10, 2018, and sank in shallow waters (two killed); decommissioned January 28; partly recovered; claimed to be under major repairs
Shiraz? (Mowj-3) intelligence-collection ship							Under construction by Ministry of Defense at Bandar Abbas shipyard
Dena? (Mowj-4)							Under construction by Defense Ministry at Tamjidi shipyard, with improved weapons systems and electronics
Sahand (Mowj-5)*	74		2018	94.5		34	Manufactured by IRIN; includes Iranian-made gearbox and variable pitch propellers; sea trial completed in March 2018 and entered service on December 1, 2018. Reported 4,000-mile range without replenishment.
Khalij-e Fars (Persian Gulf) Class, "Project Loghman"				154	5	25	A 6,500-ton training destroyer with a claimed range of 8,000 nm, under development; to be equipped with Iranian-made gas turbine units

* Apparently, as many as two more Mowj-class frigates are under construction.

Appendix B (Continued)

Vessel	Pennant Number	Base	Commission Year	Length (m)	Draft (m)	Reported Speed (kt)	Notes
KAMAN CLASS				47	1.9	37	
Kaman	P221		1977				
Zoubin	P222		1977				
Khadang	P223		1978				
Falakhon	P226		1978				
Shamshir	P227		1978				
Gorz	P228		1978				Armed with standard missile system
Gardouneh	P229		1978				
Khanjar	P230		1981				
Neyzeh	P231		1981				
Tabarzin	P232		1981				
PAYKAN (SINAH) CLASS							
Paykan (Sinah-1)	P224		2003	47	2	36	
Joshan (Sinah-2)	P225		2006				
Derafsh (Sinah-3)	P233		2008				
Separ (Sinah-4)	P224	Anzali	2017				Constructed by Defense Ministry
Sinah-5							Under construction by Defense Ministry
Sinah-6							Under construction by Defense Ministry
Sinah-7							Under construction by IRIN
Kharg	431			207.2		21	
Bandar Abbas auxiliary ship	422			108		23	Overhauled
Bushehr auxiliary ship				108		23	
Hengam amphibious landing ship				93		16.5	
Lavan amphibious landing ship	514						

Appendix B (Continued)

Vessel	Pennant Number	Base	Commission Year	Length (m)	Draft (m)	Reported Speed (kt)	Notes
Kalat multipurpose vessel							
Submarines						Submerged (surfaced)	
KILO CLASS (877EKM)							
Tareq (901)		Bandar Abbas	1991	72.6	6.2	17 (10)	Overhauled in 2015
Nouh (902)		Bandar Abbas	1992				
Younes (903)		Bandar Abbas	1996				Overhauled in 2016
Fateh class (920)		Bandar Abbas	2019	45–48	3.1	14 (11)	Officially entered service on February 17, 2019; armed with torpedoes, Nasr antisurface missiles, and mines
Nahang		Bandar Abbas	2007	20–25	2.5	13	Believed to be experimental
Ghadir class		Bandar Abbas	2007	29	2.5	11	About 20 are believed to be in IRIN service, and possibly more with the IRGC

Appendix C: IRGCN/IRGC RANK INSIGNIA[a]

IRGCN		IRGC	
Navi	Seaman	*Sarbaz*	Private
2nd Navi	Seaman 2nd Class	*2nd Sarbaz*	Private 2nd Class
1st Navi	Seaman 1st Class	*1st Sarbaz*	Private 1st Class
Sar Navi	Chief Seaman	*Razmyar*	Corporal
3rd Navyar	Petty Officer 3rd Class	*3rd Razmavar*	Sergeant 3rd Class
2nd Navyar	Petty Officer 2nd Class	*2nd Razmavar*	Sergeant 2nd Class
1st Navyar	Petty Officer 1st Class	*1st Razmavar*	Sergeant 1st Class
2nd Navdar	Chief Petty Officer	*2nd Razmdar*	Master Sergeant 2nd Class
1st Navdar	Senior Chief Petty Officer	*1st Razmdar*	Master Sergeant 1st Class
3rd Navban	Probationary Ensign	*3rd Sotvan*	3rd Lieutenant
2nd Navban	Ensign	*2nd Sotvan*	2nd Lieutenant
1st Navban	Lieutenant Junior Grade	*1st Sotvan*	1st Lieutenant
Navsarvan	Lieutenant	*Sarvan*	Captain
3rd Navsalar	Lieutenant Commander	*Sargord*	Major
2nd Naavsalar[b]	Commander	*2nd Sarhang*	Lieutenant Colonelb
1st Navsalar	Captain	*Sarhang*	Colonel
2nd Daryadar	Vice Commodore	*2nd Sartip*	2nd Brigadier General
Daryadar	Commodore	*Sartip*	Brigadier General
Daryaban	Rear Admiral	*Sar Lashkar*[c]	Divisional General
Daryasalar	Vice Admiral	*Sepahbod*[d]	Corps General
Daryabod	Admiral		

NOTES

a. IRGCN and IRGC ranks are generally suffixed in Persian with the word *pasdar* (guard).
b. From lieutenant colonel upward, specific ranks are colloquially prefixed with the word sardar (frontline military commander).
c. Currently, this is the highest existing rank within the IRGC.
d. Thus far, this rank has only been granted posthumously to Qods Force commander Qasem Soleimani, who was killed in a U.S. airstrike in January 2020.

Appendix D: MAJOR IRGC NAVAL WAR GAMES (2006–17), WITH SIGNIFICANT BACKGROUND DEVELOPMENTS

Name	Date	Duration (Days)	Location	Participation	Stated Objective	Notable Features
Great Prophet 1	3/31–4/6/2006	7	Persian Gulf, Strait of Hormuz, and Chabahar	IRGCN/IRIN/IRGC Aerospace Force (IRGC-ASF)/Basij (coastal defense); Hormozgan province Hamzeh HQ, Bushehr province Muharram HQ, Khuzestan province Imam Hussein HQ, including Khoramshahr and Mahshahr, Nasr Air Defense HQ	Deterrence	Test of Shkval/wing-in-ground (WIG) effect (craft)/Fajr-3 rocket with cluster warhead and Shahab-2 missile as expression of friendship to neighbors; sea minelaying; large number of speedboats; minelaying using Fajr rockets; Kowsar missile test; rocket torpedo test; Su-25s; antiship missile fired from helicopter; ex-Iraqi Polnocny landing ship assaulted and destroyed
Great Prophet 2	11/2–11/11/2006	10	Persian Gulf and Oman Gulf coastal areas; Persian Gulf and Strait of Hormuz	IRGCN/IRGC Ground Forces (IRGC-GF) (10 mechanized and infantry brigades) / Basij (up to 788 battalions)	Responding to just-concluded U.S.-GCC drills to show off defensive capabilities and improve IRGC's deterrence. Operations on the ground (in 10 provinces) and at sea.	120 km Noor missile fired from Mi-171 helicopter; helicopter and airborne (An-74/Il-76) assault on islands and coastal areas from 1,450 km inland included missile attacks with Shahab-3, Fateh-110, and Zolfaqar-73; Misagh MANPADS; antiship missiles with 170 km range, including FL-10; automatic artillery with 75 km range; swarming using armed boats; threat to close Strait of Hormuz; practicing asymmetric warfare on the ground; 1,800 Special Operations teams
Great Prophet 3	7/8–7/13/2008	6		IRGCN/IRGC-ASF SSM forces/Basij	Deterrence	Mass firing of nine SSMs, including Shahab-3 with cluster warhead; photoshopped image created a media frenzy; swarming with speedboats; Shkval test-firing; Raad missile with 350 km range; minelaying; WIG
Great Prophet 4	9/27–9/28/2009	2		IRGC missile drill	Sustained defensive missile firepower; managing extended-time missile warfare; improvement to missile designs	Multiple launches of Shahab-1 and 2, Zelzal, Tondar, and Fateh ballistic missiles; first operational tests of Qadr-1F and Zelzal triple launcher

Appendix D (Continued)

Name	Date	Duration (Days)	Location	Participation	Stated Objective	Notable Features
Great Prophet 5	4/22–4/25/2010	4	South of Iran, Persian Gulf	IRGCN/IRGC-ASF/IRGC-GF/Basij	Combined arms/concentration of force	Diving drills; swarm and other maneuvers covering the entire Persian Gulf; missile-targeting using UAV data; Raad, Silkworm, Noor, Fajr-5 firing; Qatari observers attended; radar jamming; minelaying; rocket and artillery firing from the coast; Special Operations at sea; commando raid against a decommissioned ship/testing Ya Mahdi robot boat
	7/2010					IRGCN HQ moved to Bandar Abbas
Great Prophet 6	6/27–7/6/2011	10	Semnan Desert	IRGC-ASF (missile drill)	Quick reaction to aggression using all missile forces; message: beginning of the end of foreign naval presence in the region	Fired 14 SSMs and rockets from underground silos; used Ghadir radar with 1,100 km range; tested Qadr-1S with barrage warhead; simultaneously fired Shahab-1, 2, 3, Ghadr-F, also Qiam and Zelzal (triple launcher); Khalij-e Fars and Tondar (HQ-2 in surface mode) missiles fired against moving naval targets; Sejjil originally scheduled to be test-fired but apparently was not
Great Prophet 7	7/2–7/4/2012	3	Semnan Desert	IRGC-ASF/IRGC-GF	A warning to the "warmongers." Launch of missiles from multiple locations against singular target in Lut Desert	Combined UAV/Su-25 targeting using data link; bombing used Karrar UAV and Shahed-129; Khalij-e Fars missile fired at a barge; multiple launches of Shahab-1, 2, 3, Qiam, Tondar, Fateh, Zelzal; simulated destruction of 35 U.S. bases, including a simulated air base
Great Prophet 8	2/23–3/25/2013	3	SE Iran	IRGC-GF/IRGCN/Basij	Mosaic defense against a land offensive; electronic warfare (EW) and electronic support measures (ESMs); coordinating command and control of various units in asymmetric environments; testing new indigenous equipment	IRGC-GF's debut in a drill with an independent HQ and six units; short-range missiles and rockets fired; UAVs used extensively; Arash 20 mm anti-helicopter shoulder-fired rifle tested; automatic 12.7 machine gun with laser aiming used; extensive artillery drills undertaken; Zafar antiship missile tested from speedboat

Appendix D (Continued)

Name	Date	Duration (Days)	Location	Participation	Stated Objective	Notable Features
	5/2013			Defense Ministry/ IRGC-ASF		Ministry of Defense delivers 26 Shahab transporter-erector-launchers (TELs) to IRGC in a public ceremony
	11/2013					Joint plan of action agreed
Missile test	2/2014					Iran announces it has tested a missile with Barani warhead (on Zelzal(?)
Delivery	3/2014			Defense Ministry/ IRGC-ASF		More Ghadr-H, Qaem, Fateh-110, and Khalij-e Fars missiles delivered to IRGC
Unveiling	5/2014			IRGC-ASF		New versions of Fateh (Hormuz 1 and 2) unveiled
Great Prophet 9	2/25–3/4/2015	8	Persian Gulf/Strait of Hormuz	IRGCN/IRGC-GF/ IRGC-ASF	Security-oriented drill	Combined naval, ground, and air warfare drills; cruise missiles launched with apparent 270 km range; Khalij-e Fars missile tested against an aircraft carrier mockup; guided Zelzal missile (Raad-307) tested; Shahed-129 UAV with 30-hour endurance tested; 3,000 km radius; missiles, rockets, and suicide boats launched at carrier mockup; air assault; sea mining
	2/4/2015					Framework for a nuclear deal agreed
	7/14/2015					Comprehensive nuclear deal achieved following a 12-year standoff
Imad SSM test launch	11/10/2015			IRGC-ASF	Deterrence	Imad SSM test-fired
Underground missile city	14/10/2015			IRGC-ASF	Deterrence	Underground missile tunnel complex shown on TV
Ghadr SSM test launch	11/2015			IRGC-ASF		Test launch of Ghadr-110(?), an improved version of Shahab-3 with 1900 km range
	1/2016					UNSCR 2231 takes effect
Eqtedar-e Velayat missile exercise	3/8–3/9/2016	2	East Alborz mountains (fired at Makran coast)	IRGC-ASF	Hebrew message on ballistic missile	Firing a variety of ballistic missiles, including Ghadr-H and F and Qiam from underground silo

Appendix D (Continued)

Name	Date	Duration (Days)	Location	Participation	Stated Objective	Notable Features
Great Prophet 10	4/12–4/14/2016	3	Sistan and Baluchestan, Kerman, South Khorasan, and Hormozgan provinces	IRGC-ASF, along with operational introduction of IRGC army aviation	Practicing offensive tactics; winning hearts and minds of locals	Up to 110 Beit al-Muqaddas battalions reportedly participated; air assaults; asymmetric warfare; counterinsurgency; extensive use of drones; "hearts and minds" operations
	1/29/2017		Semnan site			Test of ballistic missile (probably Khoramshahr) or space launch vehicle reportedly failed
Great Prophet 11	2/20–2/22/2017	3	Iran's central and eastern deserts	IRGC-GF artillery units	Deterrence, urban defense	Firing Zelzal and Fajr-3, 4, 5 (guided) rockets with 100 km range from Semnan test range; long-range artillery
Naval parade	8/10/2017			4th naval district	Show of force	IRGCN paraded over 110 speedboats in the Persian Gulf. Two days earlier, an Iranian drone came within 100 feet of a jet from the USS Nimitz in the Persian Gulf, forcing it to take evasive action. It was the thirteenth case of such unsafe interactions in 2017, vs. thirty-five in all of 2016, according to the U.S. Navy.
Khoramshahr SSM unveiled	9/22/2017		Tehran	IRGC-ASF	Deterrence	Believed to have been modeled after North Korean Hwasong-10; reportedly tested July 11, 2016, and January 29, 2017, with partial or no success; test footage shown October 12, 2017
	8/7/2018					First phase of reimposition of U.S. sanctions against Iran
Naval drills	8/2–8/5/2018	4	Strait of Hormuz/ Persian Gulf	IRGCN/IRGC-ASF	Show of force	In reaction to reimposition of U.S. sanctions and talk of bringing Iran's oil exports to standstill. Included test launch of Fateh Mobin IIR guided ballistic missile. No media coverage.

Appendix D (Continued)

Name	Date	Duration (Days)	Location	Participation	Stated Objective	Notable Features
Great Prophet 12	12/22/2018	1 (final phase)	Qeshm Island and surrounding waters	IRGCN's Zolfaqar surface combat brigade/IRGC-GF/IRGC-ASF	Testing offensive operational and tactical doctrine; apparently timed to coincide with transit of USS Stennis carrier group through Strait of Hormuz	Tested new naval and ground offensive tactics, practicing long-range air assaults on enemy islands, amphibious landings on coastal areas, and large-scale seizure of territory and destruction of enemy infrastructure for the first time. Antiship missiles fired; armed AH-1 Cobra helicopters used.

Appendix E: IRIN'S LONG-RANGE TASK FORCES AND NAVAL VISITS ABROAD

Surface Group No.	Participants	Originating Sector	Operating Area	Mission	Start Date	End Date	Duration (Days)	Port Calls	Notes
-[a]	Unknown		Caspian Sea	Flag	2007			Bandar-e Anzali	Russian navy surface group's visit
1	*Alborz* (72), *Bushehr* (422)[b]		Arabian Sea, Gulf of Aden	Antipiracy, flag	May 10, 2009	July 07, 2009	58	Djibouti	In 1988 the IRIN began a transformation to a "strategic navy"
2	*Naghdi* (82), *Bandar Abbas* (421)			Antipiracy, flag	July 4, 2009	September 6, 2009	64	Salalah	
3	*Sabalan* (73), *Kharg* (431)		Arabian Sea, Gulf of Aden	Antipiracy, flag	August 31, 2009	November 17, 2009	78	Djibouti, Salalah	
4	*Alborz* (72), *Bushehr* (422)			Antipiracy, flag	November 11, 2009	February 3, 2010	84	Djibouti, Salalah	
5	*Lavan* (513), *Chirou* (482)		Gulf of Aden	Antipiracy, flag	January 22, 2010	March 7, 2010	44	Salalah	Both were support vessels
6	*Naghdi* (82), *Bandar Abbas* (421)		Arabian Sea, Gulf of Aden	Antipiracy, flag	January 24, 2010	March, 19, 2010	54	Doha, Salalah	
7	*Sabalan* (73), *Kharg* (431)		Arabian Sea, Gulf of Aden	Antipiracy, flag	March 17, 2010	June 17, 2010	92	Djibouti, Salalah	1,900 nm
8	*Naghdi* (82), *Bandar Abbas* (421)		Arabian Sea, Gulf of Aden	Antipiracy, flag	June 12, 2010	September 12, 2010	92	Djibouti, Salalah	
9	*Alvand* (71), *Kharg* (431)			Antipiracy, flag	August 28, 2010	November 15, 2010	79	Djibouti, Salalah	
10	*Larak* (512), *Chirou* (482)			Antipiracy, flag	November 13, 2010	January 2, 2011	50		Both were support vessels

Appendix E (Continued)

Surface Group No.	Participants	Originating Sector	Operating Area	Mission	Start Date	End Date	Duration (Days)	Port Calls	Notes
11	*Bayandor* (81)		Gulf of Aden		December 29, 2010	January 29, 2011	31		
12	*Alvand* (71), *Kharg* (431)	1	Gulf of Aden, Bab al-Mandab Strait, Red Sea, Mediterranean	Antipiracy, flag	January 27, 2011	March 21, 2011	53	Jeddah, Latakia, Muscat	Crossed Suez Canal; sailed in Mediterranean; crew attended Hajj pilgrimage; saved a Hong Kong ship from pirates in Red Sea. On March 15, 2011, the Israeli navy seized in the Mediterranean a cargo ship originating in Latakia, two weeks after the Iranian naval group visited the Syrian port. It was carrying 50 tons of arms (including two C-704 missiles), apparently bound for Hamas. 
13	*Delvar*, *Tonb* (514)				March 17, 2011	May 1, 2011	45	Salalah	Both were support vessels; countered pirate attack against Iranian-flagged 300,000-ton Najm supertanker
14	*Naghdi* (82), *Bandar Abbas* (421), Younes submarine (903)		Arabian Sea, Gulf of Aden; Bab al-Mandab, Red Sea, Younes; according to Fars News Agency, "navigated as far as Red Sea."	Antipiracy, escort, training	April 30, 2011	July 5, 2011	66	Salalah, Muscat, Djibouti	First IRIN blue-water submarine mission; claimed to have broken the 65-day record belonging to the U-977 in which German U-boat commander Heinz Schaeffer escaped to Argentina in 1945. (The submerged part of the U-977's journey in fact took 66 days—considered to be the second longest in World War II, after the U-978's 68 days—and its whole journey took 99 days.)
15	*Alvand* (71), *Bushehr* (422)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab	Antipiracy, flag, intel collection	July 20, 2011	October 9, 2011	81	Djibouti (3 days), Salalah	4,320 nm

Appendix E (Continued)

Surface Group No.	Participants	Originating Sector	Operating Area	Mission	Start Date	End Date	Duration (Days)	Port Calls	Notes
16	*Jamaran* (76), *Bandar Abbas* (421)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab	Antipiracy, flag, intel collection	October 9, 2011	December 19, 2011	71	Djibouti, Salalah	9,700 nm. Jamaran's first long-distance voyage; saved an Iranian ship from pirates in Bab al-Mandab and another southeast of India
17	*Alvand* (71)	1	Gulf of Aden, Indian Ocean	Antipiracy	January 9, 2012	February 1, 2012	13	-	Shortest known antipiracy mission ever undertaken by IRIN
18	*Naghdi* (82), *Kharg* (431)		Arabian Sea, Gulf of Aden, Red Sea, Mediterranean	Antipiracy, flag, intel collection, training	January 22, 2012	March 26, 2012	64	Jeddah, Salalah	12,000 nm. Hajj pilgrimage; IRIN's second foray into Mediterranean 
19	*Alborz* (72), *Bushehr* (422)		Arabian Sea, Gulf of Aden	Antipiracy, intel collection	March 26, 2012	June 19, 2012	85		Rescued a Chinese cargo ship from pirate attack, and countered pirate attack against U.S.-flagged Maersk *Texas* in the Gulf of Oman
20	*Alvand* (71), *Bandar Abbas* (421)	1	Arabian Sea, Gulf of Aden	Antipiracy, intel collection	May 5, 2012	June 4, 2012	30		Heavily involved in counterpiracy operations. Rescued a Singapore-flagged ship from pirates near Bab al-Mandab.
21	*Alvand* (71), *Bandar Abbas* (421)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab, Gulf of Oman	Antipiracy, flag, intel collection, training	June 20, 2012	September 5, 2012	77	Djibouti, Salalah	9,600 nm completed; 225 cadets
22	*Naghdi* (82), *Kharg* (431)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab, Red Sea	Antipiracy, flag	September 1, 2012	November 14, 2012	74	Salalah, Port Sudan (October 29, 2012)	Third IRIN mission beyond Bab al-Mandab and into the Red Sea.

Appendix E (Continued)

Surface Group No.	Participants	Originating Sector	Operating Area	Mission	Start Date	End Date	Duration (Days)	Port Calls	Notes
23	*Jamaran* (76), *Bushehr* (422)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab, Red Sea	Antipiracy, flag	November 13, 2012	January 21, 2013	69	Port Sudan	
24	*Sabalan* (73), *Kharg* (431)	1	Gulf of Aden, Indian Ocean, Strait of Malacca, South China Sea, Pacific Ocean	Antipiracy, flag intel collection, training	January 22, 2013	April 4, 2013	72	Jinjiang (China), Colombo (Sri Lanka)	13,500 nm. First IRIN voyage to the Pacific; first IRIN visit to Chinese waters.
25	*Alborz* (72), *Larak* (512)		Arabian Sea, Gulf of Aden	Antipiracy, flag	April 3, 2013	June 2, 2013	60	Salalah	Rescued Liberian ship from pirates
26	*Alvand* (71), *Bandar Abbas* (421)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab	Antipiracy, flag	June 2, 2013	August 20, 2013	79	Djibouti, Salalah	
-	*Joshan* (P225), *Paykan* (P224)	4	Caspian Sea	Flag, training	June 29, 2013	July 3, 2013	4	Astrakhan (4 days)	First flag visit to Russia and first IRIN voyage in Volga
27	*Sabalan* (73), *Kharg* (431) (replaced mid-term with *Larak*)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab	Antipiracy, flag, intel collection	August 19, 2013	November 21, 2013	94	Port Sudan, Salalah	Rescued Iranian gas carrier from pirates at Bal al-Manab. Kharg's last mission before overhaul; replaced by Larak mid-mission on August 19, 2013.
28	*Alborz* (72), *Bandar Abbas* (421), Younes submarine (903), AB-212 helicopter	1	Arabian Sea, Gulf of Aden, Indian Ocean	Antipiracy, flag, training	November 20, 2013	January 31, 2014	72	Mumbai, Colombo	Heaviest IRN task force to date; rescued Pakistani and Liberian ships from attacking pirates
29	*Sabalan* (73), *Bandar Abbas* (421), *Lavan* (514)[c]		Gulf of Aden, Indian Ocean, Red Sea	Antipiracy, flag, training			95	Salalah, Djibouti, Muscat	Lavan completed a 33-month overhaul and refit on November 30, 2013; also armed with C-714 antishipping missiles

Appendix E (Continued)

Surface Group No.	Participants	Originating Sector	Operating Area	Mission	Start Date	End Date	Duration (Days)	Port Calls	Notes
-	*Neyzeh, Khanjar* (from Iran)		Gulf of Oman	Naval drills with Pakistan					
-	*Alvand, Bushehr,* Shamshir Atashbar tugboat (IRGC) (from Iran)		Gulf of Oman	Joint SAR drills with Oman and Pakistan	April 9, 2014	May 3, 2014	6		Annual search and rescue drills with Pakistan and Oman. IRGCN's Atashbar firefighting tugboat (IRGCN task group from Fifth Sector) traveled to Gulf of Oman for the drills
30	*Alvand* (71), *Bushehr* (422)		Arabian Sea, Gulf of Aden, Bab al-Mandab, Red Sea,	Antipiracy, flag	April 18, 2014	July 27, 2014	100	Port Sudan, Dar es Salaam, Salalah	Longest mission; five engagements with pirates; first equator crossing.
31	*Bayandor* (81), *Bandar Abbas* (421)	2	Arabian Sea, Gulf of Aden, Bab al-Mandab	Antipiracy, flag	July 16, 2014	Novemebr 13, 2014	120		Rescued six Iranian and foreign ships, inducing a Chinese container ship on September 14, 2014. First long-range mission for B*ayandor* after major overhaul and refit completed on June 11, 2013, which added Noor antishipping missiles and 76 mm gun.
-	Changchun destroyer (DG-150), Changzhou frigate (549)	1	Arabian Sea, Gulf of Aden, Gulf of Oman, Persian Gulf	Flag, joint basic search and rescue drills	September 20, 2014	Unknown		Bandar Abbas	Chinese anti-piracy surface group visited Iran, "first time in Persian Gulf" (?)
32	*Jamaran* (76), *Bushehr* (422)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab	Antipiracy, flag, drills	November 4, 2014	Unknown		Salalah, Djibouti	Took part in Muhammad-Rasul-Allah joint exercise; also recused Iranian tankers four times from pirate swarms; Iran's parliament speaker visited the group while docked at Djibouti
33	*Naghdi* (82), *Bandar Abbas* (421)	1	Arabian Sea, Gulf of Aden, Indian Ocean, Strait of Malacca, Pacific Ocean	Anti-piracy, flag, intel collection, training, night drills	January 20, 2015	April 7, 2015	77	Colombo (February 8, 2015), Jakarta (February 27, 2015), Kochi, India (March 24, 2015)	9,870 nm. Rescued two Iranian tankers from pirate attacks; Saudi media claimed Egyptian naval vessels drove Iranian surface group out of Gulf of Aden; Iran denied.

Appendix E (Continued)

Surface Group No.	Participants	Originating Sector	Operating Area	Mission	Start Date	End Date	Duration (Days)	Port Calls	Notes
34	*Alborz* (72), *Bushehr* (422)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab, Red Sea	Antipiracy, flag, intel collection, military maneuvers	April 8, 2015	June 14, 2015	74	Muscat	Was closely monitored and warned off by the coalition; Iran claimed it warned off AU.S. and French helicopters near Aden/Bab al-Mandab; rescued a foreign cargo ship; on the night of May 13, 2015 "terrorist boat" approached Alborz at high speed from direction of Yemen only to turn back before getting to one mile
35	*Alvand* (71), *Bandar Abbas* (421)	1	Gulf of Aden, Indian Ocean, Bab al-Mandab, Red Sea	Antipiracy, flag, intel collection	June 22, 2015	September 17, 2015	87	Salalah (August 12, 2015); some countries refused the service group port service	Rescued four foreign ships from separate mass pirate attacks near Bab al-Mandab
-	*Volgodonsk* (014), *Makhachkala* (162)	4		Flag, joint drills	August 9, 2015	August 12, 2015	3	Bandar-e Anzali	Third Russian navy surface group visit to Iran
36	*Jamaran* (76), *Bushehr* (422)		Arabian Sea, Gulf of Aden	Antipiracy, flag, intel collection	September 18, 2015	November 30, 2015	73		
-	*Damavand* (77), *Paykan* (P224), *Joshan* (P225)			Flag, training	October 22, 2015	Unknown		Astrakhan, Baku	Flag trip to Russia; *Damavand*'s first and IRIN's second visit to Russia.
37	*Sabalan* (73) *Tonb* (513)* (recently overhauled)	1		Antipiracy, special operations	December 1, 2015	January 10, 2016	40	Salalah	5,500 nm. Four engagements with pirates, rescued two ships. For some reason, *Sabalon* appears to have replaced *Alvand* mid-trip.
38	*Bayandor* (81), *Bushehr* (422), *Lavan* (514)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab, Red Sea	Antipiracy, flag, intel collection, training	January 20, 2016	April 2, 2016	73	Crossing equator, Dar es Salaam (March 1, 2016)	7,600 nm
39	*Alvand* (71)	1	Indian Ocean, Gulf of Bengal	Flag (ceremonial)	January 17, 2016	February 26, 2016	40	India	Flag trip to attend Indian Independence Day ceremonies

Appendix E (Continued)

Surface Group No.	Participants	Originating Sector	Operating Area	Mission	Start Date	End Date	Duration (Days)	Port Calls	Notes
-		1		Flag, joint drills	April 2016	April 2016	4		Pakistan Navy surface group docked at Bandar Abbas
-		1	Strait of Hormuz, Gulf of Oman		May 24, 2016	May 28, 2016	4	Bandar Abbas	Indian Navy surface group docked at Bandar Abbas
40	*Alborz* (72), *Tonb* (513)	1	Gulf of Aden, Bab al-Mandab, Red Sea	Antipiracy, flag, intel collection, training	April 2, 2016	May 27, 2016	55	Salalah	6,870 nm
41	*Naghdi* (82), *Lavan* (514)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab	Antipiracy, flag, intel gathering	June 1, 2016	July 18, 2016	47		5,130 nm. Rescued an Iranian ship from pirates.
42		1	Arabian Sea, Gulf of Aden, Bab al-Mandab	Antipiracy, flag, intel gathering, training	July 18, 2016	September 7, 2016	51		6,600 nm. Rescued a stranded Iranian dhow with seven crew members.
-		1	Strait of Hormuz, Gulf of Oman	Flag visit, joint drill	August 27, 2016	August 31, 2016	4	Bandar Abbas	Indian navy's surface group visits Bandar Abbas and conducted a joint drill with *Sabalan* and *Alborz* on September 1, 2015
43		1 (2?) Jask	Arabian Sea, Gulf of Aden, Bab al-Mandab	Antipiracy, flag	September 7, 2016	October 5, 2016	28	Karachi (September 27, 2016)	2,550 nm. Conducted joint drills with Pakistan Navy (October 1, 2016); was planning to visit western South Africa, weather permitting; group's return to Jask coincided with Saudi Gulf Shield 1 naval exercise in Persian Gulf and Strait of Hormuz.
-		4	Caspian Sea		September 2016	September 2016		Baku	Flag trip to Azerbaijan
-			Off Yemeni coast		October 1, 2016				Emirati SWIFT supply vessel was struck by missile or drone boat
44		1	Arabian Sea, Gulf of Aden, BAM, Indian Ocean	Antipiracy, flag, training	Ocyober 5, 2016	March 11, 2016	157	Dar es Salaam (October 29, 2016), Durban	IRIN' made first attempt at foray into the Atlantic by sailing around Africa
-		1	Gulf of Oman, Strait of Hormuz	Flag, joint military exercise	Unknown	Unknown	4	Bandar Abbas	Pakistan Navy visited Bandar Abbas

Appendix E (Continued)

Surface Group No.	Participants	Originating Sector	Operating Area	Mission	Start Date	End Date	Duration (Days)	Port Calls	Notes
45		1	Arabian Sea, Gulf of Aden, Atlantic Ocean	Antipiracy, flag, training	February 26, 2017	April 17, 2017	50	Salalah, Kochi (March 27, 2017), Karachi (April 8, 2017)	4,550 nm. Conducted joint drills with Pakistan Navy (April 11, 2017).
-		4	Caspian Sea	Flag	March 2017	March 15, 2017		Makhachkala (March 9, 2017)	Fifth flag visit to Russia
-		4	Caspian Sea	Flag	April 8, 2017	Unknown		Kazakhstan	First flag visit to Kazakhstan
-	Pakistan Navy	1	Gulf of Oman, Strait of Hormuz	Flag, training	Unknown	Unknown		Bandar Abbas (March 12, 2017)	
-	*Sabalan* (73), *Falakhon* (P226), *Lavan* (514), SH-3D helicopter	1	Arabian Sea, Gulf of Oman	Joint drills, search and rescue	April 8, 2017	April 15, 2017	7		IRIN surface group left for Oman for joint naval drills with Omani navy
46	*Sabalan* (73), *Lavan* (514)	1	Gulf of Aden	Antipiracy, flag, intel collection	April 17, 2017	June 11, 2017	55		
-	*Makhachkala* (162)	1	Caspian Sea		July 13, 2017	July 15, 2017	2		Russian surface group docked at Bandar-e Anzali (fifth as such)
47	*Alborz* (72), *Bushehr* (422)	4	Arabian Sea, Gulf of Aden, Indian Ocean	Antipiracy, intel collection, training, ELINT/ COMINT	June 17, 2017	September 2, 2017	77	Salalah (August 1, 2017)	8,500 nm
-	Changchun destroyer (DDG-150), *Jin Zhou* (FFG-532), *Chaohu* (890) replenishment ship	1	Gulf of Oman, Strait of Hormuz	Flag, training, joint drills	June 15, 2017	June 19, 2017	4	Karachi, Bandar Abbas	Chinese navy surface group docked at Bandar Abbas; conducted joint drills with IRIN
48	*Alvand* (71), *Lavan* (514)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab	Antipiracy, flag, intel collection	October 2, 2017	Unknown			Rescued Iranian cargo ships from pirates near Bab al-Mandab

Appendix E (Continued)

Surface Group No.	Participants	Originating Sector	Operating Area	Mission	Start Date	End Date	Duration (Days)	Port Calls	Notes
-	Stenka-calss G124 patrol boat	4	Caspian Sea	Flag	October 6, 2017	October 9, 2017	3	Anzali	First Azerbaijani navy visit to Iran
-	*Damavand* (77), *Paykan* (P224)	4	Caspian Sea	Flag, training	October 14, 2017	Unknown		Makhachkala (October 21, 2017)	Surface group visit to Russia
49	*Sabalan* (73), *Bandar Abbas* (421)	1	Arabian Sea, Indian Ocean, Bay of Bengal	Antipiracy, flag, International Multilateral Maritime Search and Rescue Exercise (IMMSAREX) 2017	November 2017	December 2017		Cox's Bazar (Bangladesh) (November 25-29), Chittagong (December 2, 2017)	To participate in annual IMMSAREX in Bay of Bengal (November 26-27, 2017). Iran suggested forming joint regional maritime security task force.
-	*Rah Naward* training ship, *Dehshat* fast-attack craft (missile) (1014)	1	Gulf of Oman, Strait of Hormuz	Flag, joint drills	November 20, 2017	November 24, 2017	4	Bandar Abbas (November 20, 2017)	Pakistan Navy's goodwill visit to Iran
50	*Naghdi* (82), *Bayandor* (81), *Tonb* (513)	1	Arabian Sea, Indian Ocean, blue waters	Antipiracy, flag, training	January 30, 2018	March 17, 2018	46	Colombo (February 16, 2018), Mumbai (March 6, 2018) (3 days)	
51	Unknown				Unknown	Unknown			No details available
52	Unknown				Unknown	Unknown			No details available
53	Unknown				Unknown	Unknown			No details available
54	*Sabalan* (73), *Kharg* (431)	1	Gulf of Aden, Arabian Sea, Bab al-Mandab	Antipiracy	June 20, 2018	Unknown			*Kharg* returned to sea after a five-year overhaul and refit, including its boiler(s).

Appendix E (Continued)

Surface Group No.	Participants	Originating Sector	Operating Area	Mission	Start Date	End Date	Duration (Days)	Port Calls	Notes
55	*Naghdi* (82), *Kharg* (431)	1	Gulf of Aden		June 11, 2018	August 21, 2018	71	Salalah, Muscat	
56	*Naghdi* (82), *Bushehr* (422)	1	Unknown	Intel collection, operational	August 28, 2018	November 1, 2018	65		8,872 nm navigated in total
57	*Khanjar* (P230), *Neyzeh* (P231), *Bushehr* (422) + 1 x AB-212 helicopter	3	Arabian Sea, Gulf of Aden	Antipiracy, flag, training, joint exercise with Pakistan	October 2, 2018	October 16, 2018	14	Karachi (October 11, 2018, for three days)	Participated in a two-day joint littoral search and rescue drill with Pakistan
58	*Naghdi* (82), *Tonb* (513)	1	Arabian Sea, Gulf of Aden	Antipiracy, intel collection	November 22, 2018	December 15, 2018	53	Salalah	3,970 nm navigated in total
59	*Alvand* (71), *Kharg* (431)	1	Arabian Sea, Gulf of Aden	Antipiracy, intel collection	December 8, 2018	January 20, 2019	43	Salalah	5,988 nm navigated in total
60	*Bayandor* (81), *Lavan* (514), *Bushehr* (422)	1	Arabian Sea, Gulf of Aden, Indian Ocean	Antipiracy, flag, intel collection, training	January 20, 2019	March 16, 2019	52	Colombo (February 15, 2019 for three days), Muscat	5,600 nm navigated in total. Also participated in IRIN's Velayat-97 naval exercise in the Gulf of Oman and the Arabian Sea in late February 2019 as intelligence collectors.
61	*Sabalan* (73), *Bandar Abbas* (421)	1	Arabian Sea, Gulf of Aden, Bab al-Mandab	Antipiracy, intel collection, drills with Oman	March 16, 2019	May 22, 2019	67	Port Sultan Qaboos, Salalah	5,100 nm navigated in total Participated in joint search and rescue drills with Oman
-	*Joshan* (P225), *Separ* (P234)	4	Kazakhstan, Caspian Sea	Flag, training	April 22, 2019	April 29, 2019	8	Port Aktau, Kazakhstan	

Appendix E (Continued)

Surface Group No.	Participants	Originating Sector	Operating Area	Mission	Start Date	End Date	Duration (Days)	Port Calls	Notes
62	*Bayandor* (81), *Lavan* (514), *Bushehr* (422)	1	Arabian Sea, Gulf of Aden	Antipiracy, intel collection, training, security patrols	May 2019	July 2019	~60		2,350 nm navigated in total 
63	*Sahand* (74), *Kharg* (431)	1	Gulf of Aden, Gulf of Oman, Red Sea security patrol/ tanker escort	Intel collection, maritime security and escort	August 26, 2019	October 29, 2019	100		15,000 nm. Described by IRIN as a "long-term maritime security and escort mission amid increasing tension in the region, intended to create strategic depth." First long-range mission for Sahand, which was commissioned in November 2018. Sahand is reportedly the most heavily armed and longest-range warship in the IRIN arsenal, with 150 days of seafaring endurance.
64	*Alvand* (71), *Bandar Abbas* (421)	1	Gulf of Aden, Gulf of Oman, Red Sea security patrol/ tanker escort	Intel collection, maritime security and escort	October 29, 2019	Unknown			Escorted Iranian tankers as far as way Suez Canal
65	Unknown				Unknown	Unknown			No details available
-	Joint naval drills		Arabian Sea, Gulf of Oman	Antipiracy, search and rescue	December 27, 2019	December 2019	3		Participats were warships from Russia and China, as well as IRIN and IRGCN units
66	*Bayandor* (81), *Kharg* (431)	1	Arabian Sea, Gulf of Oman, Indian Ocean	Flag, intel collection, training, combat, security	January 30, 2020	-		Jakarta (February 25, 2020 for three days)	

NOTES

a. Dashes instead of numbers indicate activity outside usual Arabian Sea/Gulf of Aden surface group activity.
b. Parentheticals indicate vessel's pennant number.
c. The *Lavan* and *Tonb* landing ships switched pennant numbers in 2013.

MAP 3. PERSIAN GULF: GRAND STRATEGIC SCHEME

- Continental shelf boundary
- Inland waters (territorial sea) boundary
- Contiguous zone boundary
- Iran straight baseline (measures breadth of territorial sea)
- Iran flight information region (FIR) boundary
- Iraq–Kuwait median line
- Iran–Iraq median line
- RGCN interpretation of Iranian territorial waters through the Strait of Hormuz
- Ocassional misrepresentation of Iran's (straight) baseline between turning points 14 and 15
- Omani straight baseline claim

- Major city/port
- IRGCN base
- IRIN base
- Coalition air or naval base
- UAV base
- Oil and gas site/platform
- Oil and gas terminal
- Manifold
- Water desalination plant
- Prevalent sea current

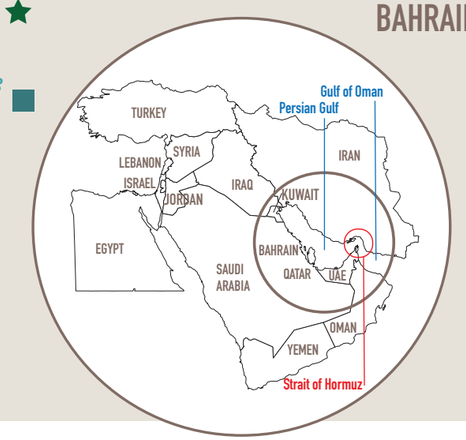
IRAQ
KUWAIT
SAUDI ARABIA
IRAN
QATAR
BAHRAIN
UAE
OMAN

BASRA
ABADAN
IRGCN Arvand riverine base
al-Basra oil terminal
BANDAR KHOMEINI
3rd IRGCN Naval District, Mahshahr
IRGCN 3
IRGCN missile base, Bandar Sejafi
Bahregan oil center
Kharg
IRIN naval base, Kharg
Gorreh oil pumping station
IRGCN base, Farsi Island
2nd IRGCN Naval District, Bushehr
IRIN naval base, Bushehr (IRIN Southwest Fleet HQ)
IRGCN Engineering HQ and 26th Salman Missile Brigade
Hypothetical inland waters boundary based on a low water baseline
SHIRAZ
BUSHEHR
IRGCN 2
IRGCN Ansar-al-Hossein naval base, Bandar-e Dayyer
IRGCN 4
Asaluyeh gas-condensate production refinery and terminal
4th IRGCN Naval District, Asaluyeh
Gorreh-Jask oil pipeline (under construction)
IRGCN 5
Lavan
Hendurabi
Kish
Lesser Faror
Greater Faror
Sirri
5th "Naze ar" IRGCN Naval District, Bandar Lengeh
Abu Musa
Lesser Tunb
Greater Tunb
Hengam
IRGCN 112th Naval Combat Brigade
Oeshm
1st "Emamat" IRIN Naval District, Bandas Abbas
1st IRGCN Naval District, BANDAR ABBAS
Hormuz
Larak
IRIN
STRAIT OF HORMUZ
IRGCN 1
IMO traffic separation scheme
Naval base under construction
Future site of new oil & gas storage & export terminal
2nd "Velayat" IRIN Naval District Jask
IRGCN Emamat naval and missile base, Jask
IRIN 2/IRGCN Emamat
IRIN 3/IRGCN Imam Ali
3rd "Nabovat" IRIN. Naval District Konarak
IRGCN Imam Ali naval base, Chabahar
IRIN Pasabandar naval and SIGINT base
KHOR FAKKAN
FUJAIRAH
DUBAI
JEBEL ALI
ABU DHABI
Camp de la Paix
al-Dhafra Air Base
Dolphin gas pipeline to UAE
Habshan–Fujairah crude oil pipeline
Barakah nuclear power plant project
al-Hamra Army Base
Muscat Int'l Airport
MUSCAT
MINA AL-FAHAL

Not finalized
IRAN–SAUDI ARABIA
BAHRAIN–IRAN–SAUDI ARABIA
BAHRAIN–IRAN
BAHRAIN–SAUDI ARABIA
IRAN–QATAR
IRAN–QATAR–UAE (Abu Dhabi)
IRAN–UAE (Dubai)
IRAN–OMAN
QATAR–UAE (Abu Dhabi)

Camp Buehring
KUWAIT CITY
Ali al-Salem Air Base
al-Ahmadi
Camp Spearhead
Camp Arifjan
Khafji oil field
Ras Al-Khair water desalination plant
JUBAIL
King Abdulaziz naval base
Ras Tanura
Saudi Petroline & Abqaiq–Yanbu NGL Pipeline
Abqaiq (Buqayq) oil center
RIYADH
Prince Sultan Air Base
NSA Bahrain (5th Flt)
HMS Jufair
MANAMA
Isa Air Base
FSO
Ras Laffan
QATAR
DOHA
al-Udeid Air Base

0 10 20 50 100 150 200 km
50 100 mi



The Author

FARZIN NADIMI is an associate fellow with The Washington Institute who specializes in the security and defense affairs of Iran and the Persian Gulf region. A native Persian speaker, Nadimi holds a PhD in Middle Eastern studies from the University of Manchester and a master's degree in war studies from King's College London. The current study reflects a comprehensive update of his 2008 Policy Focus on the same topic, written under the pseudonym Fariborz Haghshenass.

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