The Gulf Military Balance in 2019: A Graphic Analysis

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Photo: ARASH KHAMOUSHI/AFP/Getty Images
Introduction
The military balance in the Gulf region has become steadily more complex with time. Conventional forces have been reshaped by massive arms transfers, and changes in major weapons, technology, and virtually every aspect of joint warfare, command and control, sensors, and intelligence, surveillance, and reconnaissance systems.

Missile warfare is changing radically as diverse mixes of ballistic and cruise missiles, UAVs and UCAVs, and missiles are deployed. Precision-guided, conventionally armed missiles are becoming a key aspect of regional forces, and so are missile defenses. The threat of nuclear proliferation remains, and at least one state – Iran – is a declared chemical weapons power while the Assad regime in Syria has made repeated use of chemical weapons.

At the same time, asymmetric forces, “proxy” forces, and various forms of military advisory and support missions are playing a growing role in local conflicts and gray area operations. So are local militia and security forces – often divided within a given Gulf state by sect and ethnicity. Terrorist and extremist forces continue to pose serious threats, as do political tensions and upheavals, and the weaknesses and failures of some regional governments to meet the needs of their people.

The most serious sources of Gulf conflicts are now the tensions between Iran and the Arab Gulf states, and the role played by terrorists and extremists, but civil war and insurgencies remain an additional threat – as does the links between Iran, Syria, and the Hezbollah. The growing role of Russia and Turkey add to regional instability as does the uncertain role of the U.S. and its focus on linking sanctions to Iran’s military activities.

No one analysis can cover all of these military developments, or avoid relying heavily on uncertain data, but the Burke Chair at CSIS has prepared a graphic analysis that focuses on key developments in Gulf military forces, and selected aspects of regional security.

This report is being distributed for comment in working paper form. Its contents include maps, tables, and graphics that summarize the following key aspects of the balance:

- **An Unstable Region Where Civil Violence May Dominate:** Key maps and graphics highlighting the level of instability by state, the rising intensity of political protests, the levels of extremist and terrorist violence relative to risk, and the recent patterns in overall extremist and total ISIS attacks.

- **Divided Along Ethnic and Sectarian Lines:** Maps showing key Sectarian and Ethnic divisions.

- **Growing Iranian Influence and Recent Attacks:** Maps showing the areas where Iran’s support of the Hezbollah, the Assad regime in Syria, and factions with Iraq, is having a growing destabilizing impact on the Gulf.

- **The Struggle for Iraq:** Maps highlighting the deep ethnic and sectarian divisions in Iraq, the role of Iranian-backed Popular Militia Forces, the vulnerability of key Iraqi petroleum facilities, and the fact that defeat of the ISIS physical “Caliphate” has not meant the defeat of either ISIS or extremism in Iraq.

- **Comparative Military Budgets and Arms Transfers:** Graphs and tables showing the steady build-up of military spending and arms transfers in the Gulf region, and the vast advantage Arab states have had in such spending and access to modern military technology relative to Iran. These spending levels, however, also place a major burden on some Arab economies and are too high a percent of GDP to allow proper economic growth and job creation.

- **It should be noted that boycott of Qatar and other tensions between the Arab states shown – along with the lack of integrated defense systems, battle management, and IS&R capability plus the lack of real-world readiness and meaningful exercise activity – critically cuts the value of both Arab numerical superiority and far higher military expenditures and arms transfers.**

- **U.S. Forward Deployed Forces:** Maps and graphs that show that the United States remains the dominant outside power in the Gulf – regardless of recent force cuts and debates over burdensharing.
• **Total Regular Gulf Military Forces:** A table showing the classic summary measures of conventional force strength by country, and in a comparison of total Gulf Cooperation Council and Iranian forces. It should again be noted that boycott of Qatar and other tensions between the Arab states shown – along with the lack of integrated defense systems, battle management, and IS&R capability plus the lack of real-world readiness and meaningful exercise activity – critically cuts the value of both Arab numerical superiority and far higher military expenditures and arms transfers.

• **Nuclear Forces:** Maps and tables that warn that Iranian proliferation remains a serious potential threat.

• **Missile Forces:** A range of tables and maps showing the rising Iranian missile threat, the reliance of the Gulf Arab states on air power, and Iran’s emphasis on precision missile strike capability as a substitute for its limits in airpower.

• **Land Forces:** Tables showing the comparative land balance – the only major area of conventional forces where Iran has parity or possible superiority, but one where Iran is not organized to sustain long-range maneuver, has only token amphibious-forced entry capability, and would have to attack through Iraq. This leaves Kuwait as the only GCC country with high vulnerability.

• **Naval Forces:** The Arab states have an advantage in high quality larger surface vessels, but have serious readiness issues, and would be heavily dependent on U.S. help to prepare for combat and then operate together effectively. Iran has an advantage in anti-ship missiles, smart mines, and asymmetric warfare capability. All Gulf states, however, would suffer severely from any conflict that halted commercial shipping through the Strait of Hormuz and that reduced their petroleum export income.

• **Air and Air Defense Forces:** Iran has updated many of its aircraft as much as possible, but they are no longer competitive with most Arab combat aircraft. The Arab states also have a major advantage in the quality of their surface-to-air defenses – although the Iranian deployment of the Russian S-300 is sharply reducing this advantage. Once again, the Arab advantage is offset by a lack of integrated and interoperable AC&W, AWACS, IS&R, and battle management capability. They would be heavily dependent on U.S. help to prepare for combat and then operate together effectively.

• **The Yemen War:** This tragic conflict has increased Iranian influence in the Indian Ocean and Red Sea area, and presented major problems for Saudi and UAE forces and cooperation.

• **Petroleum and Infrastructure Targets:** Every military balance is a balance of comparative vulnerabilities as well as one of relative military capability. Both Iran and the Arab Gulf states are highly vulnerable to attacks on critical petroleum and infrastructure facilities. High levels of escalation present a major risk to both sides.
Evolving Gulf Balances in an Era of Growing Complexity

- Major war, limited war, proxy, threats
- **Gray Area and Proxy - sabotage**
- Missiles: Ballistic, Cruise, RPVs, Air Launched, Sea Launched – precision strike
- Air: Strike/attack, fighter, IS&R, SAM, BMD
- Gulf/Indian Ocean/Red Sea -- Naval, Missile, Air, Mines.
- **Control of Iraq: Sectarian, PMFs, Ethnic, Extremist, Iran, U.S.**
- Counter extremism/ISIS, AQAP, other
- Nuclear, chemical, (BW?)
- Critical petroleum, economic, infrastructure, desalination targeting
- Cyber, electronic warfare, critical node/sensor
- US/Europe, Russia, Turkish, China presence/influence
- Arab disunity, boycott of Qatar, distancing of Oman, Kuwait neutral , UAE tensions with Saudi
- Turkey vs. Kurds, Idlib, Syria
- Yemen War
- Ethnic and sectarian, internal and local tensions and conflict: Syria, Iraq, Bahrain, Saudi
- Shi‘ite “axis”: Hezbollah, Syria, Iraq, Iran
- Sanctions vs. military action, intimidation
An Unstable Region where Civil Violence May Dominate
Broader Gulf Military Theater

Source: https://www.geographicguide.com/asia/maps/middleeast.htm
The Edge of Repression and Impact of Failed States

Source: Adapted from the *The Economist*, January 7, 2016
Failed States Help Shape Military Risk and Extremism Risk

Chart developed by Abdullah Toukan using the SIRA model.

The Rising Pace of Civil Protests in the Middle East: 2016-2018

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<td>2019 (October 24)</td>
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Source: "Armed Conflict Location & Event Data Project (ACLED); acleddata.com", Abdullah Toukan using the SIRA model.
Extremism: Non-State Terrorist Attack Imposed on World Bank Ratings of Stability and Absence of Violence – 2018

Highest Intensity of non-state terrorism attacks are in countries that rank between 160 to 200 in the “Political Stability and Absence of Violence” country rank.

Mainly, Afghanistan, Iraq, Syria, Yemen and the sub-Saharan Africa.

The GCC countries are mostly in the Low Ranks, in the Stable Low Risk Region.

Source: “Armed Conflict Location & Event Data Project (ACLED); acleddata.com”, graphics developed by Abdullah Toukan using the SIRA model.
ACLED Estimate of Recent Violence in the MENA Region

ACLED Estimate of Comparative Suicide Bombings Against Government and Civilian Targets in Syria and Gulf, South Asia, and Africa: 2011-2018

The Islamic State continues to conduct attacks...it orchestrated 572 attacks from January through September 2019 across 21 provinces in Iraq (276 attacks) and Syria (296 attacks). In Iraq, the attacks have occurred in provinces like Diyala, Anbar, Ninewa, Kirkuk, and Salahuddin. In Syria, Islamic State attacks have largely been centered in Raqqah, Dayr az Zawr, Homs, and Hasakah.

Perhaps most concerning, there are still at least 30,000 to 37,000 jihadist fighters in Syria and Iraq from the Islamic State and two al-Qaeda-linked groups: Hay’at Tahrir al-Sham and Tanzim Hurras al-Din.

Over the next several months, more jihadists may enter the battlefield after escaping—or being released—from prisons run by the Syrian Democratic Forces (SDF) in areas like al-Hol, located in eastern Syria near the border with Iraq.

After all, there are roughly 10,000 Islamic State fighters in prisons run by the SDF, as well as thousands more in prisons and camps that may support an extremist ideology.

While Hay’at Tahrir al-Sham has experienced sometimes frosty relations with Ayman al-Zawahiri and other al-Qaeda leaders, the organization still has strong connections with Salafi-jihadist networks in the region. Tanzim Hurras al-Din has close links with al-Qaeda and is led by Faruq al-Suri, an al-Qaeda veteran.
Divided Along Ethnic and Sectarian Lines
Sectarian Divisions in MENA

Source: M. Izady, DeLorme University’s Gulf 2000 project

http://www.nytimes.com/interactive/2016/01/04/world/middleeast/sunni-shiite-map-middle-east-iran-saudi-arabia.html?_r=0
The Broader “Kurdish Problem”

Key Kurdish Areas in Syria, Iraq, and Iran

Source: Dr. Abdullah Toukan, adapted from CIA, Kurdish Lands Map.
Growing Iranian Influence and Recent Attacks
The “Shi’ite Crescent”

Source: CIA Factbook
C7: Iran’s Key Areas of Strategic Influence

Source: RadioFreeEurope
https://www.rferl.org/a/iran-influence-yemen-iraq/26924135.html
Iranian Attacks in May-September 2019

- **July 20**: British Stena Impero oil tanker seized and diverted into Iranian waters
- **June 19**: Iran shoots down another US drone over Strait of Hormuz
- **June 13**: Attack on tankers from Japan and Norway
- **Sept 14**: Drones attacks at two major Aramco facilities in Abqaiq and Khurais, Saudi Arabia
- **July 10**: British Heritage tanker harassed by the Revolutionary Guards
- **May 12**: Four foreign oil tankers attacked
- **Aug 20 and June 6**: Iran-backed Houthi rebels shoot down two US drones over Dhamar governorate, Yemen within three months of each other

Source: https://www.google.com/search?q=Map+of+missile+attacks+on+Saudi+oil+facilities+in+2019&client=firefox-b-1-d&sourceid=phantom4&ie=UTF-8&ved=0ahUKEwiJ04qdt8HlAhUs01kKHQ5saAmpoQ9QIwCzYCEC6aCQ=slenmp
Bahrain’s Island Vulnerability

**Ethnic groups:**
Bahraini 46%, Asian 45.5%, other Arab 45.7%, African 1.6%, European 1%, other 1.2% (2010 census)

**Languages:**
Arabic (official), English, Farsi, Urdu

**Religions:**
Muslim (Shia and Sunni) 70.3%, Christian 14.5%, Hindu 9.8%, Buddhist 2.5%, other 2.8% (2010 census)

Shi’ite-Sunni sectarian tension has been a continuing challenge.

**Population:**
1,410,942 July 2017 est.
country comparison to the world: 155 note: population is 48% immigrant.
urban population: 89.3% of total population (2018); rate of urbanization: 4.38% annual rate of change (2015-20 est.)
The Struggle For Iraq
Iraq’s Strategic Position

The Iran-Iraq Border Area

Source: Australian National University, https://www.google.com/search?q=Iraq-Iran+border+map&client=firefox-b-1&tbs=isch&source=iu&ictx=1&fir=Zx8dCVG47k3E4%2C253%252CwFRnF%2BykTuM%252C_&usg=__cnRP2OFoY0k9h3AI3osRQOeSBE%3D&sa=X&ved=2ahUKEwijq6S4rMfcAhXN8KXc9DCwQsQiwgBegh0CAYQ8g#imgrc=slz3ntU760J6uM
The legacy of the war with the Islamic State strains security in Iraq in two other important ways. First, the Popular Mobilization Committee (PMC) and its militias—the mostly Shia Popular Mobilization Forces (PMF) recruited to fight the Islamic State—have been recognized as enduring components of Iraq’s national security establishment. This is the case even as many PMF units continue to operate outside the bounds of their authorizing legislation and the control of the Prime Minister. The U.S. intelligence community considers Iran-linked Shia elements of the PMF to be the “the primary threat to U.S. personnel” in Iraq.

Second, national and KRG forces remain deployed across from each other along contested lines of control while their respective leaders are engaged in negotiations over a host of sensitive issues. Following a Kurdish referendum on independence in 2017, the Iraqi government expelled Kurdish peshmerga from some disputed territories they had secured from the Islamic State, and IS fighters now appear to be exploiting gaps in ISF and Kurdish security to survive. PMF units remain active throughout the territories in dispute between the Iraqi national government and the federally recognized Kurdistan Region of northern Iraq, with local populations in some areas opposed to the PMF presence.

Iraq’s Popular Mobilization Forces contributed to Iraq’s fight against the Islamic State, though ties between some PMF components and Iran have prompted Iraqi and international concerns. In 2016, the CDR adopted a law to provide for a permanent role for the PMF as part of Iraq’s national security sector. The law calls for the PMF to be placed under the authority of the Prime Minister as commander-in-chief and to be subject to military discipline and organization. Some PMF units have demobilized, but many remain outside the law’s defined structure, including some units associated with groups identified by the State Department as receiving Iranian support.

U.S. officials have expressed concern about potential attacks by Iran-linked PMF forces and other militias amid U.S. tensions with Iran, and reduced the number of personnel deployed to the U.S. Embassy in Baghdad in May 2019. In July 2019, Prime Minister Abd al Mahdi issued a decree restating a requirement that PMF units either serve as “an indivisible part of the armed forces and be subject to the same regulations” or disarm. Recent changes in military command personnel are renewing questions about the integrity and political independence of the armed forces (Christopher M. Blanchard, Iraq and U.S. Policy Iraqis Struggle to Define a Way Forward, CRS 10.22.2019, cblanchard@crs.loc.gov, 7-0428.)

Notes: Areas of influence are approximate and subject to change.
C27: Iraq’s Vulnerable Energy Facilities


Iraq: Continuing Violence

Source: United Nations Assistance Mission in Iraq. Some months lack data from some governorates.

Source: Christopher M. Blanchard, Iraq: Issues in the 116th Congress, CRS, R45633, March 26, 2019

Figure 4. Iraq Reported Islamic State-Related Security Incidents
January 1, 2019 to March 8, 2019

Comparative Military
Budgets and Arms Imports
## Comparative Estimates of Defense Spending 2018

*(current $USD billions)*

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Note: UAE estimate is authors’ estimate.

IISS: Comparative Military and Security Spending in 2018
(Current $US Billions)

Source: Adapted by the author from IISS, *Military Balance* 2019, Chapter Seven, “The Middle East and North Africa.”.

No data available for Qatar, Libya, UAE, and Syria.
Comparative Estimates of Military Spending as Percent of GDP, 2018

- **NATO goal is 2%**
- **U.S. = 3.11%-3.26%** *
- **Russia = 3.10%-3.68%** *
- **China = 1.26%-1.27%**

Note: Qatar & UAE data unavailable for IISS and IIHS & IHS respectively. Syria, and Yemen are at war and no estimate is possible, but must exceed 8%. NATO goals is 2%. U.S. is 3.26%, Russia is 3.68%, China is 1.27%.

SIPRI: Low Iranian Military Spending Relative to Arb States, 2000-2018
(Current $USD millions)

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- Iran never spent more than $16.5 billion per year from 2000-2018
- Saudi Arabia alone average over $0 billion petr per year and spent $67.5 billion in 2018 vs. $13.1 billion in 2018.
- UAE rose from $5.4 billion in 2002 to $25.6 billion in 2013. Estimated to have spent over $24 billion from 2015 on.

U.S. Estimates Massive Arab Lead in Arms Imports:

Arab states placed $199.7 billion in new orders 2008-2015. Iran placed $900 million

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"0" represents any value below $50 million or nil. All data are rounded to the nearest $100 million.
New Conventional Arms Deliveries by Supplier, 2008-2015
(in current millions $USD)

Source: Catherine A. Theohary, Conventional Arms Transfers to Developing Nations, 2007-2014, Congressional Research Service, December 21, 2015, pp. 37-38. "0" represents any value below $50 million or nil. All data are rounded to the nearest $100 million.
### New Conventional Arms Transfer Agreements by Supplier, 2008-2015 (in current millions $USD)

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Source: Catherine A. Theohary, *Conventional Arms Transfers to Developing Nations, 2008-2015*, Congressional Research Service, December 19, 2016, pp. 36. All data are rounded to the nearest $100 million.
SIPRI Estimate of Imports by the Arab States versus Imports by Iran
(Comparative value in Trend Indicator Values or TIVs)

SIPRI: Comparative Gulf Arms Imports, 2000-2018
(Current $USD billions)

TIV of arms exports to all, 2000-2018
Figures are SIPRI Trend Indicator Values (TIVs) expressed in millions.
Figures may not add up due to the conventions of rounding.
A ‘0’ indicates that the value of deliveries is less than 0.5m
For more information, see http://www.sipri.org/databases/armstransfers/sources-and-methods/

U.S. Forward Deployed Forces
Nominal U.S. Deployments in the MENA/ Gulf Region in Early 2019

**US Central Command** • *Operation Freedom’s Sentinel* 8,000

**ARABIAN SEA:** US Central Command • US Navy • 5th Fleet: 1 SSGN; 1 DDG; 1 LSD; **Combined Maritime Forces** • TF 53: 1 AE; 2 AKE; 1 AOH; 3 AO

**BAHRAIN:** US Central Command • 5,000; 1 HQ (5th Fleet); 2 AD bty with MIM-104E/F Patriot PAC-2/3

**BRITISH INDIAN OCEAN TERRITORY:** US Strategic Command • 300; 1 Spacetrack Optical Tracker at Diego Garcia; 1 ground-based electro-optical deep space surveillance system (*GEODSS*) at Diego Garcia

**DJIBOUTI:** US Africa Command • 4,700; 1 tpt sqn with C-130H/J-30 Hercules; 1 spec ops sqn with MC-130H/J; PC-12 (U-28A); 1 CSAR sqn with HH-60G Pave Hawk; 1 CISR UAV sqn with MQ-9A Reaper; 1 naval air base

**EGYPT:** MFO 454; elm 1 ARNG recce bn; 1 ARNG spt bn

**IRAQ:** US Central Command • *Operation Inherent Resolve* 5,000; 1 div HQ; 1 cav bde(-); 1 EOD pl; 1 atk hel sqn with AH-64D Apache

**ISRAEL:** US Strategic Command • 1 AN/TPY-2 X-band radar at Mount Keren

**JORDAN:** US Central Command • *Operation Inherent Resolve* 2,300: 1 FGA sqn with 12 F-15E Strike Eagle; 1 CISR UAV sqn with 12 MQ-9A Reaper

**QATAR:** US Central Command • 10,000: 1 bbr sqn with 6 B-1B Lancer; 1 ISR sqn with 4 RC-135 Rivet Joint; 1 ISR sqn with 4 E-8C JSTARS; 1 tkr sqn with 24 KC-135R/T Stratotanker; 1 tpt sqn with 4 C-17A Globemaster; 4 C-130H/J-30 Hercules; 2 AD bty with MIM-104E/F Patriot PAC-2/3

**US Strategic Command** • 1 AN/TPY-2 X-band radar

**SAUDI ARABIA:** US Central Command • 500 (3,000-THAAD)

**SYRIA:** US Central Command • *Operation Inherent Resolve* 2,000+; 1 ranger unit; 1 mne bn; 1 arty bty with M777A2; 1 MRL bty with M142 HIMARS

**TURKEY:** US European Command • 1,700; 1 tkr sqn with 14 KC-135; 1 ELINT fit with EP-3E Aries II; 1 air base at Incirlik; 1 support facility at Ankara; 1 support facility at Izmir

**US Strategic Command** • 1 AN/TPY-2 X-band radar at Kurecik

**UNITED ARAB EMIRATES:** US Central Command • 5,000: 1 ftr sqn with 6 F-22A Raptor; 1 ISR sqn with 4 U-2; 1 AEW&C sqn with 4 E-3 Sentry; 1 tkr sqn with 12 KC-10A; 1 ISR UAV sqn with RQ-4 *Global Hawk*; 2 AD bty with MIM-104E/F Patriot PAC-2/3

Source: IISS Military Balance 2019, p. 60-62
# U.S. Power Projection in War Against ISIS and Extremism

**Operation Inherent Resolve**

<table>
<thead>
<tr>
<th>Strike Aircraft (manned)</th>
<th>Number of Weapons Released (Manned &amp; RPA strike assets)</th>
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<tbody>
<tr>
<td><strong>Sorties</strong></td>
<td><strong>Jan</strong></td>
</tr>
<tr>
<td>2015</td>
<td>2,456</td>
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<tr>
<td>2016</td>
<td>2,718</td>
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<td>2017</td>
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<tr>
<td>2018</td>
<td>738</td>
</tr>
<tr>
<td>2019</td>
<td>2,005</td>
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</table>

Statistics provided includes numbers of sorties (not strikes) and munitions expended by aircraft under Combat Air Force Command.

**Operation Freedom's Sentinel/Rotate Support Mission**

<table>
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<tr>
<th>Strike Aircraft (manned)</th>
<th>Number of Weapons Released (Manned &amp; RPA strike assets)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sorties</strong></td>
<td><strong>Jan</strong></td>
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<tr>
<td>2013</td>
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<td>54</td>
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<tr>
<td>2018</td>
<td>378</td>
</tr>
<tr>
<td>2019</td>
<td>463</td>
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</table>

Statistics provided includes numbers of sorties (not strikes) and munitions expended by aircraft under CFACC control.

**Iraq & Syria**

- **Intel, Surveillance and Recon Sorties**: 9,514, 12,270, 14,015, 7,782, 10,004
- **Airlift and Airdrop Sorties**: 10,050, 8,400, 9,448, 8,450, 4,965
- **Airlift Cargo (Short Tons)**: 78,550, 72,800, 68,337, 43,566, 23,435
- **Airlift Passengers**: 47,200, 46,900, 76,802, 76,969, 46,000
- **Supplies Airdropped (Pounds)**: 111,200, 822,171, 641,746, 605,570, 904,460
- **Tanker Sorties**: 14,757, 13,064, 13,243, 8,697, 5,292
- **Fuel Offloaded (Millions of Pounds)**: 912, 804, 778, 520, 360
- **Aircraft Refuelings**: 84,381, 80,912, 70,338, 52,061, 33,150

**Afghanistan**

- **Intel, Surveillance and Recon Sorties**: 31,049, 32,999, 21,634, 19,681, 15,404, 12,716, 13,158
- **Airlift and Airdrop Sorties**: 32,000, 17,040, 6,900, 10,300, 11,300, 12,783, 7,417
- **Airlift Cargo (Short Tons)**: 201,000, 158,400, 50,000, 69,200, 84,208, 83,984, 55,753
- **Airlift Passengers**: 506,000, 222,700, 78,000, 111,100, 120,594, 150,330, 132,283
- **Supplies Airdropped (Pounds)**: 10,985,000, 28,000, 0, 0, 33,423, 667,880, 244,213
- **Tanker Sorties**: 12,319, 9,085, 5,323, 4,910, 5,714, 4,673, 2,557
- **Fuel Offloaded (Millions of Pounds)**: 728, 536, 201, 150, 170, 189, 97
- **Aircraft Refuelings**: 53,256, 46,703, 26,162, 18,137, 17,589, 19,214, 12,553

Source: AFCENT, AFCENT (CAOC) Public Affairs –afcent.pa@afcent.af.mil, https://www.afcent.af.mil/About/Airpower-Summaries/
Total Gulf Regular Military Forces
## Iran and the Arab Gulf Balance in 2019

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<th>Reserve Personnel</th>
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<th>AIFVs</th>
<th>APCs</th>
<th>Towed Artillery</th>
<th>Self-Propelled Artillery</th>
<th>Multiple Rocket Launchers</th>
<th>Combat Aircraft</th>
<th>Attack Helicopters</th>
<th>Major SAM Launchers</th>
<th>Destroyers</th>
<th>Frigates</th>
<th>Corvette</th>
<th>Patrol and Coastal</th>
<th>Submarines</th>
<th>Submersibles</th>
<th>Mine Warfare</th>
<th>Landing Ships</th>
<th>Landing Craft</th>
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</tbody>
</table>

Nuclear Forces
Iran had two facilities - Natanz and Fordo - where uranium hexafluoride gas was fed into centrifuges to separate out the most fissile isotope, U-235.

Low-enriched uranium, which has a 3%-4% concentration of U-235, can be used to produce fuel for nuclear power plants. "Weapons-grade" uranium is 90% enriched.

In July 2015, Iran had almost 20,000 centrifuges. Under the JCPOA, it was limited to installing no more than 5,060 of the oldest and least efficient centrifuges at Natanz until 2026 - 10 years after the deal’s “implementation day” in January 2016. Iran’s uranium stockpile was reduced by 98% to 300kg (660lbs), a figure that must not be exceeded until 2031. It must also keep the stockpile’s level of enrichment at 3.67%.

By January 2016, Iran had drastically reduced the number of centrifuges installed at Natanz and Fordo, and shipped tonnes of low-enriched uranium to Russia.

In addition, research and development must take place only at Natanz and be limited until 2024. No enrichment will be permitted at Fordo until 2031, and the underground facility will be converted into a nuclear, physics and technology centre. The 1,044 centrifuges at the site will produce radioisotopes for use in medicine, agriculture, industry and science.

Iran had been building a heavy-water nuclear facility near the town of Arak. Spent fuel from a heavy-water reactor contains plutonium suitable for a nuclear bomb...Under the JCPOA, Iran said it would redesign the reactor so it could not produce any weapons-grade plutonium, and that all spent fuel would be sent out of the country as long as the modified reactor exists. Iran will not be permitted to build additional heavy-water reactors or accumulate any excess heavy water until 2031.

Source: Google, https://www.google.com/search?q=map+of+iranian+nuclear+facilities&client=firefox-b-1&dbsrc=&sourceid=chrome&ie=UTF-8&client=firefox-b&tbm=isch&sa=G&ei=39oYcX4fT35h4gqRQ8oCAw&ved=0CEgQ-AhUKEWJXvQHPp8tRIJ5jXz3wDIDp8p8l#imgrc=gNsb6dG9BFBP3M

47
Hard Targets: Iran’s Fordow Facility

Figure 1. A 2019 Google Earth image with a schematic of the underground tunnel complex overlain. The schematic was part of the Iranian Nuclear Archive, as revealed by Israeli Prime Minister Benjamin Netanyahu on April 30, 2018.

Figure 2. Overview of the Fordow facility, which includes the underground tunnel complex and the support complex.

Regional Nuclear Capabilities

Source: Adapted from an Analysis by Dr. Abdullah Toukan.
Missile Forces
Iran possesses the largest and most diverse missile arsenal in the Middle East, with thousands of short- and medium-range ballistic and cruise missiles capable of striking as far as Israel and southeast Europe. Missiles have become a central tool of Iranian power projection and anti-access/area-denial capabilities in the face of U.S. and Gulf Cooperation Council naval and air power in the region.
Iran has developed a wide range of missiles, from the Shahab 1 ballistic missile, with a range of 300 kilometers, to the Soumar cruise missile with a reported range of 2,500 kilometers that could strike targets anywhere in the Gulf, Israel, Egypt, Afghanistan, parts of southern and eastern Europe and elsewhere.

Key Deployment Factors

GCC vs Iran Airbases, Air Defense, and Ballistic Missile Military Balance

- Iran Nuclear Program Sites
- UAE THAAD Battery
- PAC-2/3 Battery
- AN/TPY-2 X-Band radar for BMD, with a Terminal Phase Range of 600km
- Iran Ballistic Missile Launch Sites
- Iran S-300 AD system deployed around Fordow (NYT August 29, 2016)

Reference: Abdullah Toukan adapted from:
- IISS The 2016 Military Balance Chart
- Gulf Region Missile Defense
- IISS Janes Sentinel 2016
- NTI Iran Nuclear and Ballistic Missile Locations

Source: Dr. Abdullah Toukan, November 2019
Shahab 3M Coverage

(1,000kg Warhead, Maximum Range 1.200 km)

Source: Dr. Abdullah Toukan, November 5, 2019.
## Iran’s Major Missiles

<table>
<thead>
<tr>
<th>Missile</th>
<th>Class</th>
<th>Range</th>
<th>News</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safir</td>
<td>SLV</td>
<td>350 km altitude</td>
<td>Operational</td>
</tr>
<tr>
<td>Khorramshahr</td>
<td>MRBM</td>
<td>2,000 km</td>
<td>In Development</td>
</tr>
<tr>
<td>Qiam-1</td>
<td>SRBM</td>
<td>700-800 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Shahab-1</td>
<td>SRBM</td>
<td>285-330 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Simorgh</td>
<td>SLV</td>
<td>500 km altitude</td>
<td>In Development</td>
</tr>
<tr>
<td>Koksan M1978</td>
<td>Artillery</td>
<td>40-60 km</td>
<td>Operational</td>
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<tr>
<td>Zolfaghar</td>
<td>SRBM</td>
<td>700 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Emad (Shahab-3 Variant)</td>
<td>MRBM</td>
<td>1,700 km</td>
<td>In Development</td>
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<td>Sejjil</td>
<td>MRBM</td>
<td>2,000 km</td>
<td>Operational</td>
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<tr>
<td>Shahab 2 (Scud C-Variant)</td>
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<td>500 km</td>
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<td>Shahab-3</td>
<td>MRBM</td>
<td>1,300 km</td>
<td>Operational</td>
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<tr>
<td>Ghadr 1 (Shahab-3 Variant)</td>
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<td>Fateh-110</td>
<td>SRBM</td>
<td>200-300 km</td>
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<tr>
<td>Tondar 69</td>
<td>SRBM</td>
<td>150 km</td>
<td>Operational</td>
</tr>
<tr>
<td>Soumar</td>
<td>Cruise Missile</td>
<td>2,000-3,000 km</td>
<td>Operational (presumed)</td>
</tr>
<tr>
<td>Ra’ad</td>
<td>Cruise Missile</td>
<td>150 km</td>
<td>Operational</td>
</tr>
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</table>
Iran Strategic Missile Inventory

IHS Jane's Estimate
An April 2019 estimate by IHS Jane's, another widely respected source, is very different and seems to track better with official background briefings. It states that Iran has a major production facility in Parchin. It warns that many aspects of range and reliability are unclear, but that Iran has exported missiles to Iraq, Syria, and Yemen and states that Iran is establishing a missile production facility in Syria. It also notes that Iran has supplied Shahab (dubbed 'Burkan' by Houthi forces), Qiam-1 (dubbed 'Burkan-2' and 'Burkan-2H'), and Soumar cruise missiles to the Houthi in Yemen.

The IHS Jane's brief states that Iran's Islamic Revolutionary Guards Corps Air and Space Force (IRGCASF) has the following five brigades:

- 15th Ghaem Missile Brigade, with short-range missiles such as the Fajr
- 5th Rad Missile Brigade equipped with Shahab-3/4, based in the Karaj area, northwest of Tehran
- 7th Al-Hadi Missile Brigade equipped with Shahab-1 and -2 (Scuds B and C) missiles, based in the Karaj area; and controls the Imam Ali Missile Site in Khorramabad, western Iran. IHS Jane's notes that North Korea supplied Iran with 6-12 Scud-B TELs and up to 200 missiles between 1987 and 1992, and that the US-based Federation for American Scientists estimated in 2008 that Iran possessed between 300 and 400 Shahab-1s and Shahab-2s armed with conventional warheads and distributed among 3-4 battalions.
- 19th Zulfiqar Missile Brigade, equipped with Nazeat and Zelzal short-range missiles, based in the Karaj area
- 23rd Towhid Missile Brigade, based at Khorramabad.

IHS Jane's estimates that Iran's short-range missile capabilities are separate, and include the Fateh, Shahab-1 and Shahab-2, and enhanced and modified variants of the original Scud-B and Scud-C systems. It also describes five different variants of the Fateh — including anti-ship, anti-radar, and 750-kilometer range systems. It also reports that China sold up to 100 CSS-8 (M-7/Project 8610) short-range, road-mobile, solid-propellant, single-warhead ballistic missiles at 30 TELs based on modifications of the SA-2 to Iran in 1989. It is not clear that they are still fully operational, but they have a 190 kg warhead, a 150 km range, and very poor accuracy. Iran calls them the Tondar 69. Some 90 missiles were delivered to Iran in 1992, and a further 110 may have been delivered later.

When it comes to Iran's longer-range missiles, the report indicates that the Nazeat 10 began to be tested in 2014, and is called an MRBM — although its range is unclear. It is felt to be more accurate than the Nazeat — although such reporting seems to focus on the guidance platform rather than missile tests.

IHS Jane's indicates that its liquid-fueled Qiam missiles have been mass produced since 2011, and has a range of up to 700 km with a 650 kg payload. It also cites three different versions of the liquid-fueled Shahab missile — which is derived from the North Korean No Dong, and exceeds the 1,000-kilometer range limit set by the UN. These versions include the Shahab-3A (Ghadr 101) with a range of 1,500-1,800 km, the Ghadr-1 with a range of 1,800 km, and Shahab-3B (Ghadr 110) with a range of 2,000-2,500 km.

The Shahab is being replaced or supplemented by the more accurate Qadr F with a range of 1,600 km, the Qadr H with a range of 2,000 km and improved multiple re-entry vehicle, and the Qadr S with a range of 2,000 km with cluster munitions warhead. The Khorramshar is said to still be in the test phase, and similar to the North Korean Hwasong-10 (KN-07) liquid-fueled missile with a maximum range of 2,000 km. The Seiji-2 is estimated to be another longer-range solid-fueled system with a range of 2,200 km with a 750 kg warhead. A third system called the Emad may be a modification of the Qadr and to have started delivery in 2016. Finally, Iran seems to be developing an ICBM called the Sirafir (Safir-2) out of its Simorgh satellite launch system.

According to work by Jeffery Lewis of NTI, Iran also displayed new 1,000-km long-range ballistic missile called the Dezful in February 2019. Lewis notes that Major General Mohammad Ali Jafar, a former commander of the IRGC, called the missile as "an answer to Westerners ... who think they can stop us from reaching our goals through sanctions and threats," and state that its purpose was to "to protect our nation and the oppressed and downtrodden nations in the region that may ask for help from the Islamic Republic."

In March 2015 Iran unveiled a cruise missile named Soumar. The missile retains several characteristics of the Russian-made Kh-55, six of which were acquired by Iran from Ukraine, but without the Ukrainian R95-300 turbofan engine the original terrain counter-matching (TERCOM) navigation system. The missile displayed did not appear to possess an advanced seeker head, suggesting that the navigation system is likely a mechanical inertial navigation system (INS) coupled with a GPS system. Other modifications to the original Kh-55 include a solid rocket booster rather than liquid, making it suitable for ground-launched rather than air-launched platforms.

With a warhead of between 150 and 170 kg and calculated cruise speed of Mach 0.7, the potential addition of the Soumar is viewed more as a substantial expansion of capabilities rather than a revolutionary enhancement of its missile arsenal.

# Southern Arab Gulf State Tactical Missile Inventories

<table>
<thead>
<tr>
<th>Saudi Arabia</th>
<th>UAE</th>
<th>Qatar</th>
<th>Oman</th>
<th>Bahrain</th>
<th>Kuwait</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air-Launched Missiles</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>AAM: IR AIM-9P/L Sidewinder; IIR AIM-9X Sidewinder II; IRIS-T; SARH AIM-7 Sparrow; AIM-7M Sparrow; ARH AIM-120/C AMRAAM ASM AGM-65 Maverick; AR-1 AShM Sea Eagle ARM ALARM ALCM Storm Shadow</td>
<td>AAM: IR AIM-9L Sidewinder; R-550 Magic; IIR AIM-9X Sidewinder II; IIR/ARH Mica; ARH AIM-120B/C AMRAAM ASM AGM-65G Maverick; Hakeem 1/2/3 (A/B) ARM AGM-88C HARM ALCM Black Shaheen (Storm Shadow/ SCALP EG variant)</td>
<td>AAM • IR R-550 Magic 2; ARH Mica RF ASM Apache; HOT AShM AM39 Exocet</td>
<td>IR AIM-9M/P Sidewinder; IIR AIM-9X Sidewinder II; ARH AIM-120C7 AMRAAM ASM AGM-65D/G Maverick AShM AGM-84D Harpoon</td>
<td>AAM • IR AIM-9P Sidewinder; SARH AIM-7 Sparrow; ARH AIM-120B/C AMRAAM ASM AGM-65D/G Maverick; some TOW</td>
<td>AAM • IR AIM-9L Sidewinder; R-550 Magic; SARH AIM-7F Sparrow; ARH AIM-120C7 AMRAAM ASM AGM-65G Maverick; AGM-114K Hellfire AShM AGM-84A Harpoon</td>
</tr>
<tr>
<td><strong>Surface-to-Surface Missiles</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SRBM: 6 Scud-B (up to 20 msl); MGM-140A/B ATACMS (launched from M142 HIMAzRS)</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Bombs</strong></td>
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<td></td>
</tr>
<tr>
<td>Laser-guided GBU-10/12 Paveway II; Paveway IV INS/GPS-guided GBU-31 JDAM; FT-9</td>
<td>INS/SAT guided Al Tariq Laser-guided GBU-12/58 Paveway II</td>
<td>Laser-guided EGBU-10 Paveway II; EGBU-12 Paveway II INS/GPS guided GBU-31 JDAM</td>
<td>Laser-guided GBU-10/12 Paveway II</td>
<td>Laser-guided GBU-10/12 Paveway II</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from the *IISS, Military Balance, 2018.*
Saudi Arabia
Strategic Missile Forces
• MSL ● Tactical
  • IRBM 10+ DF-3 (CH-SS-2) (service status unclear)
  • MRBM Some DF-21 (CH-SS-5) (reported)
Air-Launched Missiles
• AAM: IR AIM-9P/L Sidewinder; IIR AIM-9X Sidewinder II; IRIS-T; SARH AIM-7 Sparrow; AIM-7M Sparrow; ARH AIM-120C AMRAAM
• ASM AGM-65 Maverick; AR-1
• AShM Sea Eagle
• ARM ALARM
• ALCM Storm Shadow
Bombs
• Laser-guided GBU-10/12 Paveway II; Paveway IV
• INS/GPS-guided GBU-31 JDAM; FT-9

UAE
Surface-to-Surface Missile Launchers
• SRBM: 6 Scud-B (up to 20 msl); MGM-140A/B ATACMS (launched from M142 HIMARS)
Air-Launched Missiles
• AAM: IR AIM-9L Sidewinder; R-550 Magic; IIR AIM-9X Sidewinder II; IIR/ARH Mica; ARH AIM-120B/C AMRAAM
• ASM AGM-65G Maverick; Hakeem 1/2/3 (A/B)
• ARM AGM-88C HARM
• ALCM Black Shaheen (Storm Shadow/ SCALP EG variant)
Bombs
• INS/SAT guided Al Tariq
• Laser-guided GBU-12/58 Paveway II

Source: Adapted from the IISS, Military Balance, 2019.
Land Forces
## Comparative Active Armed Forces, Estimated Reservist, and Active Paramilitary Personnel (thousands)

<table>
<thead>
<tr>
<th>Country</th>
<th>Average</th>
<th>Active Paramilitary</th>
<th>Estimated Reservist</th>
<th>Active Armed Forces</th>
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<td>Israel</td>
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</table>

Source: IISS Country Comparison and Defense Data. 2019
Comparative Army, National Guard, Royal/Presidential Guard, IRGC Military Personnel (thousands)

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<thead>
<tr>
<th>Country</th>
<th>IRGC</th>
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<th>National Guard</th>
<th>Army</th>
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Source: IISS Country Comparison and Defense Data. 2019
## Comparative Total Land force Major Weapons Holdings

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<th>Iraq</th>
<th>Iran</th>
<th>GCC</th>
<th>Saudi</th>
<th>UAE</th>
<th>Bahrain</th>
<th>Kuwait</th>
<th>Oman</th>
<th>Qatar</th>
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<td>1,937</td>
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<td>180</td>
<td>293</td>
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<td>200</td>
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Comparative Main Battle Tank Strength, 2019

### Comparative Other Armored Vehicle Strength by Major Category, 2019

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<th>Armored Recovery</th>
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<td>Kuwait</td>
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**Source:** Adapted from IISS, “Middle East Balance,” *Military Balance 2019*, pp 334-373.
Comparative Artillery Strength by Major Category, 2019

<table>
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<tr>
<th>Country</th>
<th>Mortars</th>
<th>Multiple Rocket Launchers</th>
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<th>Self-Propelled</th>
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<tr>
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<td>106</td>
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</tr>
</tbody>
</table>

Source: Adapted from IISS, “Middle East Balance,” Military Balance 2019, pp 334-373.
Iran-Iraq Border Area

Source: Australian National University, https://www.google.com/search?q=Iraq-Iran+border+map&client=firefox-b-1&tbm=isch&source=iu&ictx=1&frq=2&dpr=1&ei=Zx8dCVG47k3E4M%253A%252CwFRmF8YkytTuM%252C_%2526usg=__cnRpZOFoKJhpaA30sRQoBD4%3D&sa=X&ved=2ahUKEwqq6S4Mf8bnW8nK5cBDCXQeAQoA-noECAYQBi4mrc=s123ntU76016oM:
The Kuwaiti “Hinge” in Land Combat in the Gulf
Naval Forces
### Iran and the Arab Gulf Naval Forces in 2019

<table>
<thead>
<tr>
<th></th>
<th>Iraq</th>
<th>Iran</th>
<th>GCC</th>
<th>Saudi</th>
<th>UAE</th>
<th>Bahrain</th>
<th>Kuwait</th>
<th>Oman</th>
<th>Qatar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Naval Personnel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marines</td>
<td>3,000</td>
<td>18,000</td>
<td>25,400</td>
<td>13,500</td>
<td>2,500</td>
<td>700</td>
<td>2,000</td>
<td>4,200</td>
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</tr>
<tr>
<td>Corps</td>
<td>1,000</td>
<td>2,600</td>
<td>3,000</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Naval IRGC</td>
<td>-</td>
<td>20,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Destroyers (with missiles)</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>-</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Destroyers (without missiles)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Frigates (with missile)</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Frigates (without missiles)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Corvettes</td>
<td>-</td>
<td>6</td>
<td>21</td>
<td>4</td>
<td>10</td>
<td>2</td>
<td>-</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Coastal Patrol Boats (with missiles)</td>
<td>78</td>
<td>53</td>
<td>9</td>
<td>20</td>
<td>4</td>
<td>10</td>
<td>3</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Coastal Patrol Boats (without missiles)</td>
<td>32</td>
<td>108</td>
<td>58</td>
<td>19</td>
<td>12</td>
<td>6</td>
<td>10</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Submarines</td>
<td>-</td>
<td>21</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Submersibles</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mine Warfare</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Landing Ships</td>
<td>-</td>
<td>13</td>
<td>3</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Landing Craft</td>
<td>-</td>
<td>13</td>
<td>42</td>
<td>5</td>
<td>17</td>
<td>9</td>
<td>6</td>
<td>5</td>
<td>-</td>
</tr>
</tbody>
</table>

Iranian Naval and IRGC Naval Asymmetric Forces in 2019

Islamic Revolutionary Guard Corps Naval Forces 20,000+ (incl 5,000 Marines)

Somearty bty

Some ASHM bty with HY-2 (CH-SSC-3 Seersucker) ASHM

EQUIPMENT BY TYPE

In addition to the vessels listed, the IRGC operates a substantial number of patrol boats with a full-load displacement below 10 tons, including ε40 Boghammar-class vessels and small Raseq-class wing-in-ground effect air vehicles

PATROL AND COASTAL COMBATANTS 126 PBFG 56:

5 C14 with 2 twin lnchr with C-701 (Kosar)/C-704 (Nasr) ASHM
10 Mk13 with 2 single lnchr with C-704 (Nasr) ASHM, 2 single 324mm TT
10 Thondar (PRC Houdong) with 2 twin lnchr with C-802A (Ghader) ASHM, 2 twin AK230 CIWS
25 Peykaap II (IPS-16 mod) with 2 single lnchr with C-701 (Kosar) ASHM/C-704 (Nasr), 2 single 324mm TT
6 Zolfagh (Peykaap III/IPS-16 mod) with 2 single lnchr with C-701 (Kosar)/C-704 (Nasr) ASHM
PBFT 15 Peykaap I (IPS-16) with 2 single 324mm TT
PBG 35: 15 Kashdom II; 10 Tir (IPS-18); ε10 Pashe (MIG-G-1900)

PB ε20 Ghom AMPHIBIOUS

LANDING SHIPS • LST 3 Hormuz 24 (Hejaz design for commercial use)

LANDING CRAFT • LCT 2 Hormuz 21 (minelaying capacity)

LOGISTICS AND SUPPORT • AP 3 Nasr COASTAL DEFENCE • ASHM C-701 (Kosar); C-704 (Nasr); C-802; HY-2 (CH-SSC-3 Seersucker)

HELICOPTERS

MRH 5 Mi-171 Hip

TPT • Light some Bell 206 (AB-206) Jet Ranger

Islamic Revolutionary Guard Corps Marines

5,000+

Amphibious 1 marine bde

Navy 18,000

In addition to the vessels listed, the Iranian Navy operates a substantial number of patrol boats with a full-load displacement below 10 tons

SUBMARINES 21

TACTICAL 21

SSK 3 Taregh (RUS Paltus Project-877EKKM) with 6 single 533mm TT

SSC 1 Feteh (in trials)

SSW 17: 16 Qadir with 2 single 533mm TT with Vafjojar

HWT (additional vessels in build); 1 Noshang

PATROL AND COASTAL COMBATANTS 67

PCFG 13 Keman (FRA Combattante II) with 1–2 twin lnchr with C-802 (Noor) (CH-SS-5-8 Saccade) ASHM, 1 76mm gun

PBG 9:

3 Hendijan with 2 twin lnchr with C-802 (Noor) (CH-SS-5-8 Saccade) ASHM
3 Koyyan with 2 single lnchr with C-704 (Nasr) ASHM 3 Parsin with 2 single lnchr with C-704 (Nasr) ASHM

PBFT 3 Kajami (semi-submersible) with 2 324mm TT

PBG 1 MILSS

PB 34: 9 C14; 9 Hendijan; 6 MkIII; 10 MkIII

AMPHIBIOUS LANDING SHIPS 12

LSTM 3 Farsi (ROK) (capacity 9 tanks; 140 troops)

LST 3 Hengam with 1 hel landing platform (capacity 9 tanks; 225 troops) LSL 6 Fouque

LANDING CRAFT 11 LCT 2

LCU 1 Leyam 110

UCAC 8: 2 Wellington Mk 4; 4 Wellington Mk 5; 2 Tandar (UK Winchester)

NAVAL AVIATION 2,600

Aircraft:

TPT 16: Light 13: 5 Do-228; 4 F-27 Friendship; 4 Turbo Commander 680; PAX 3 Falcon 20 (ELINT) HELICOPTERS

ASW ε10 SH-3D Sea King

MCM 3 RH-53D Sea Stallion

TPT • Light 17: 5 Bell 205A (AB-205A); 2 Bell 206 Jet Ranger (AB-206); 10 Bell 212 (AB-212)

MARINES 2,600

Amphibious 2 marine bde

Does not include air forces or land and air-based anti-ship missile and mine warfare capabilities.

Source: Adapted from IISS, “Middle East Balance,” Military Balance 2019, pp 334-373.
Iranian Tanker Attacks in 2019

1- May 12th four tankers attacked, 2- June 13th two tankers attacked

Key Naval Operating Areas in the Arabian Peninsula, Gulf of Oman, Indian Ocean, and and Red Sea Areas

Source: Google, CIA and EIA
The Strait of Hormuz is the world's most important oil chokepoint because of the large volumes of oil that flow through the strait. In 2018, its daily oil flow averaged 21 million barrels per day (b/d), or the equivalent of about 21% of global petroleum liquids consumption. Flows through the Strait of Hormuz in 2018 made up about one-third of total global seaborne traded oil. More than one-quarter of global liquefied natural gas trade also transited the Strait of Hormuz in 2018. At the end of 2018, the total available crude oil pipeline capacity from the two countries combined was estimated at 6.5 million b/d. In that year, 2.7 million b/d of crude oil moved through the pipelines, leaving about 3.8 million b/d of unused capacity that could have bypassed the strait. 76% of the crude oil and condensate that moved through the Strait of Hormuz went to Asian markets in 2018. China, India, Japan, South Korea, and Singapore were the largest destinations for crude oil moving through the Strait of Hormuz to Asia, accounting for 65% of all Hormuz crude oil and condensate flows in 2018.
L6: Key Naval Operating Areas in and Near the Gulf

Source: Google, CIA and EIA
Air and Air Defense Forces
Gulf Air Power And Air and Missile Bases

(Source: Jane’s IHS Marist
NTI: https://gmap.nti.org/missile_iran.html)

Source: Dr. Abdullah Toukan, November 5, 2019
Comparative Total Fixed-Wing Combat Aircraft Strength, 2019

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Iran</th>
<th>Iraq</th>
<th>GCC</th>
<th>Saudi Arabia</th>
<th>UAE</th>
<th>Kuwait</th>
<th>Qatar</th>
<th>Oman</th>
<th>Bahrain</th>
<th>Israel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft</td>
<td>336</td>
<td>65</td>
<td>748</td>
<td>407</td>
<td>156</td>
<td>66</td>
<td>18</td>
<td>63</td>
<td>38</td>
<td>352</td>
</tr>
</tbody>
</table>

Gulf Modern Combat Aircraft Inventory in 2019

**Iran:** 336 combat Aircraft: No fully modern, 94 semi-modern. **ISR** reported; 1 more on order. 21 fully modern, 19 semi-status unknown, 322 fully modern Seeker Eagle aerobatic team; 16 352 combat capable. **AEW** 28 combat Aircraft Fighting Falcon reported; up to 7 Su status unknown; 3 Su ISR 80

**Bahrain:** 28 combat Aircraft: 20 fully modern. 8 F-5E Tiger II; 4 F-5F Tiger II, **FGA** 20: 16 F-16C Block 40 Fighting Falcon; 4 F-16D Block40 Fighting Falcon

**Kuwait:** 66 combat capable, 39 fully modern. **FGA** 39: 31 F/A-18C Hornet; 8 F/A-18D Hornet. **TRG** 11 Hawk Mk64*; 16 EMB-312 Tucano*

**Oman:** 63 combat capable, 35 fully modern, **FGA** 35: 17 F-16C Block 50 Fighting Falcon; 6 F-16D Block 50 Fighting Falcon; 12 Typhoon **TRG** 4 Hawk Mk103*; 8 Hawk Mk166; 12 Hawk Mk203*; 12 PC-9*

**Qatar:** 18 combat capable, 12 Fully modern. **FGA** 12: 9 Mirage 2000ED; 3 Mirage **TRG** 6 Alpha Jet*,;

**Saudi Arabia:** 407 combat capable, 266 fully modern, 79 semi-modern. **FTR** 81: 56 F-15C Eagle; 25 F-15D Eagle. **FGA** 185+: up to 67 F-15S Eagle (being upgraded to F-15SA configuration); 47+ F-15SA Eagle; 71 **ATK** 67 Tornado IDS. **ISR** 14+: 12 Tornado GR1A*; 2+ Beech 350ER King Air. **AEW&C** 7: 5 E-3A Sentry; 2 Saab 2000 Erieye. **ELINT** 2: 1 RE-3A; 1 RE-3B. **TRG**: 24 Hawk Mk65* (incl aerobatic team); 16 Hawk Mk65A*; 22 Hawk Mk165.

**UAE:** 156 combat capable, 78 fully modern, 66 semi-modern. **FGA** 137: 54 F-16E Block 60 Fighting Falcon (Desert Eagle); 24 F-16F Block 60 Fighting Falcon (13 to remain in US for trg); 15 **Mirage** 2000-9DAD; 44 **Mirage** 2000-9EAD. **ISR** 7 Mirage 2000 RAD*. **SIGINT** 1 Global 6000 **AEW&C** 2 Saab 340 **TRG** 12 Hawk Mk102*;

**Iraq:** 65 combat capable. 21 fully modern, 19 semi-modern. **FGA** 21: 18 F-16C Fighting Falcon; 3 F-16D Fighting Falcon; **ATK** 30: 10 L-159A; 1 L-159T1; ε19 Su-25/Su-25K/Su-25UBK Frogfoot **ISR** 10: 2 Cessna AC-208B Combat Caravan*; 2 SB7L-360 Seeker; 6 Beech 350ER King Air.

**Israel:** 352 combat capable. 322 fully modern. **FTR** 58: 16 F-15A Eagle; 6 F-15B Eagle; 17 F-15C Eagle; 19 F-15D Eagle. **FGA** 264: 25 F-15I Ra'am; 78 F-16C Fighting Falcon; 49 F-16D Fighting Falcon; 98 F-16I Sufa; 14 F-35I **Adir** **ISR** 6 RC-12D Guardrail **ELINT** 4: 1 EC-707; 3 Gulfstream G550 Shavit **AEW** 4: 2 B-707 Phalcon; 2 Gulfstream G550 Eitam (1 more on order)

J3. Comparative Fixed-Wing Combat Aircraft
Strength By Type, 2019

Source: adapted from the IISS, Military Balance, 2019.
Iran: Reliance on Aging/Worn/Mediocre Systems - Air

**Aircraft**

FTR 184+: 20 F-5B *Freedom Fighter*; 55+ F-5E/F *Tiger II* 24 F-7M *Airguard*; 43 F-14 *Tomcat*; 36 MiG-29A/U/UB *Fulcrum*; up to 6 Azarakhsh (reported)

FGA 89: 64 F-4D/E *Phantom II*; 10 *Mirage F-1E*; up to 6 Saegheh (reported); up to Su-22M4 *Fitter K*; 3+ Su-22UM-3K *Fitter G*

ATK 39: 29 Su-24MK *Fencer D*; 7 Su-25K *Frogfoot* (status unknown); 3 Su-25UBK *Frogfoot* (status unknown)

ASW 3 P-3F *Orion*

ISR: 6+ RF-4E *Phantom II* *

TKR/TPT 3: ε1 B-707; ε2 B-747

TPT 117: **Heavy** 12 II-76 *Candid*; **Medium** ε19 C-130E/H *Hercules*; **Light** 75: 11 An-74TK-200; 5 An-140 (Iran-140 Faraz) (45 projected); 10 F-27 *Friendship*; 1 L-1329 *Jetstar*; 10 PC-6B *Turbo Porter*; 8 TB-21 Trinidad; 4 TB-200 Tobago; 3 *Turbo Commander* 680; 14 Y-7; 9 Y-12; **PAX** 11: 2 B-707; 1 B-747; 4 B-747F; 1 Falcon 20; 3 Falcon 50

TRG 141: 25 Beech F33A/C *Bonanza*; 15 EMB-312 *Tucano*; 14 JJ-7*; 25 MFI-17 *Mushshak*; 12 *Parastu*; 15 PC-6; 35 PC-7 *Turbo Trainer*;

**Helicopters**

MRH 2 Bell 412

TPT 34+: **Heavy** 2+ CH-47 *Chinook*; **Medium** 30 Bell 214C (AB-214C); **Light** 2+: 2 Bell 206A *Jet Ranger* (AB-206A); some Shabaviz 2-75 (indigenous versions in production); some Shabaviz 2061

Range of Iran’s Air Power

Source: Dr. Abdullah Toukan, September 24, 2016
Range of GCC Air Power

Source: Dr. Abdullah Toukan, September 24, 2016
Iranian (Pars) View of Gulf Air Threat

Source: https://www.google.com/search?q=Map+of+Gulf+military+air+bases&client=firefox-b-1&dbsrc=ACYBGNQwGHt0nNgkXUXLm0EdWJnKkA:1572350225610&tbs=isch&source=iu&ictx=1&fkorw=1X0k0ntz9z_SHMi253a%252C7F8l0fV%252C7%252C7&ved=2ahUKEwiKOGXVYq1fAhUq8hQFvVrAf1w3gQ_HkEwA3oECAQDAQkMBdUDg&imgrc=BWZdPwK9ySSM&imgdii=r0KQ6_8S8rIbC

[Map of Gulf Air Bases and Vicinity]
Iran’s Strategic Depth
Gulf SAM Defenses (Pre S-300)

Source: www.digitalcombatsimulator.com
Iranian Major Bases and SAM Defenses

Source: Israel Behind the News and https://www.google.com/search?q=Map+of+Iranian+air+defenses&client=firefox-b-1-d&sa=x&ei=ACyBGNQ4uxQ63Xm4ITtv6NdLrRadQ:1572352350650&tbm=isch&source=iu&ictx=1&fr=sb-xWzv3--wYMNz253AZS52C3gVq87kI0OF%253A9%252C-&ved=1&usg=AI4_-kRZ7Bu56OOGpL9GKmpKf0z6mnhU8kA&sa=X&ved=2ahUKEwiu1Mn6vMHlAhVnqzAKHUwAB04Q9QEwAIXoECAYQCQ#imgrc=NbQtvbLIWaH5M&imgdii=GKQL2hzUL2QhzM
THAAD vs. Patriot

THAAD and Patriot Pac-3 are complementary to each other. Patriot pac-3 intercepts aircraft/UAVs, and cruise missiles and a ballistic missile in its terminal stage of flight (in atmosphere), while Thaad intercepts a missile while it is in Stratosphere.

So, if Thaad fails in intercepting a missile Pac-3 might do that.

UAE is acquiring Patriot pac-3, Patriot pac-2, Thaad and Pantir-s1 which makes it’s airspace fully protected.

Source: https://defence.pk/pdf/threads/patriot-pac-3-successfully-intercept-a-cruise-missile.176196/page-2
Iran with S400
The Yemen War
Yemen and the Gate of Tears

Source: EIA, https://www.eia.gov/beta/international/regions-topics.cfm?RegionTopicID=WOTC
Yemen: Sectarian Divisions

Source: CIA Factbook
Yemen: The Southern Movement

Source: ECFR.EU, Mapping the Yemen Conflict
https://www.ecfr.eu/mena/yemen
Yemen: Front in June 2019

Source: ECFR.EU, Mapping the Yemen Conflict
https://www.ecfr.eu/mena/yemen
CLASHES BETWEEN ANSAR ALLAH AND SAUDI LED FORCES CONTINUE ON HADIM Front.

SAUDI-LED COALITION WARPLANES STRUCK SAADAH PROVINCE 3 TIMES.

SAUDI-LED COALITION WARPLANES STRUCK HAJJAH PROVINCE 2 TIMES.

MAHDI AL-MASHAT, THE PRESIDENT OF YEMEN’S SUPREME POLITICAL COUNCIL, ANNOUNCED THAT ANSAR ALLAH WOULD STOP MISSILE AND DRONE STRIKES ON SAUDI ARABIA AS A GOOD WILL GESTURE FOR THE FURTHER SETTLEMENT OF THE CONFLICT.

CLASHES BETWEEN ANSAR ALLAH AND SAUDI-LED FORCES WERE REPORTED IN QATHABEH AREA.
ACLED: Yemen: as of October 2019

The Conflict in Yemen:

- ACLED currently records more than 100,000 reported fatalities from 2015 to the present.
- Approximately 20,000 have been reported so far in 2019 making this the second most lethal year after 2018.
- More than 40,000 civilians have been reported since the start of 2015.
- Approximately 8,200 have occurred as of September 2019.
- The monthly number of conflict events has declined since March.
- The number of civilian fatalities remains above a steeply declining trend in violence events, such as shelling and incidents, while the number of battles has not declined.
- Daily violence in 2019 is trending downward overall.
- Allan was the most lethal month so far for this year with over 2,500 reported fatalities, compared to approximately 1,700 in September.
- The third quarter of 2019 has seen the lowest number of reported fatalities since the end of 2017, largely due to a decline in battles related.
- The number of civilian fatalities declined over the past year, while violations against civilians increased.
- The group declined is still committed to violent attacks against targets inside Saudi Arabia.

Impact of Civilians:

- ACLED currently records more than 10,000 direct civilian targeting events resulting in more than 12,000 reported civilian fatalities since 2015.
- This includes 6,000 civilian fatalities that have been reported so far in 2019.
- The third quarter of 2019 registered the first month-to-month increase in reported civilian fatalities since the third quarter of 2018.

- ACLED’s data are collected in partnership with the Yemen Data Project.

31 October 2019: The Armed Conflict Location & Event Data Project (ACLED) currently records more than 100,000 reported fatalities in Yemen since 2015, including over 12,000 civilians killed in direct attacks. These findings are consistent with recent projections drawing on ACLED data issued by the United Nations Development Programme (UNDP) and the Frederick S. Pardee Center for International Futures, which estimate that approximately 102,000 people will be killed in direct violence by the end of 2019. ACLED’s Yemen data are collected in partnership with the Yemen Data Project.

Deadliest conflict events in Yemen

All events resulting in 30 or more reported fatalities from 1 January 2019 to 26 October 2019.

Petroleum and Infrastructure Targets
Gulf Desalination facilities

THAAD and Patriot Pac-3 are complementary to each other. Patriot pac-3 intercepts aircraft/UAVs, and cruise missiles and a ballistic missile in its terminal stage of flight (in atmosphere), while Thaad intercepts a missile while it is in Stratosphere.

So, if Thaad fails in intercepting a missile Pac-3 might do that.

UAE is acquiring Patriot pac-3, Patriot pac-2, Thaad and Pantir-s1 which makes it’s airspace fully protected.

Broader Gulf Energy Infrastructure

The Strategic Importance of Gulf Exports and the Strait of Hormuz

There are limited options to bypass the Strait of Hormuz. Only Saudi Arabia and the United Arab Emirates have pipelines that can ship crude oil outside the Persian Gulf and have the additional pipeline capacity to bypass the Strait at any point. At the end of 2018, the total available crude oil pipeline capacity from the two countries combined was estimated at 8.6 million bpd. In that year, 2.7 million bpd of crude oil moved through the pipelines, leaving about 3.3 million bpd of unused capacity that could have bypassed the Strait.

### Operating pipelines that bypass the Strait of Hormuz, 2018

<table>
<thead>
<tr>
<th>Pipeline name</th>
<th>Country</th>
<th>Capacity</th>
<th>Throughput</th>
<th>Unused capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basra Crude Oil Pipeline</td>
<td>Iraq</td>
<td>0.3</td>
<td>0.3</td>
<td>0.0</td>
</tr>
<tr>
<td>FSRM Pipeline</td>
<td>Kuwait</td>
<td>0.5</td>
<td>0.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Qeshm/Sharay Oil Pipeline</td>
<td>Iran</td>
<td>1.5</td>
<td>1.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Yanbu Crude Oil Pipeline</td>
<td>Saudi Arabia</td>
<td>0.3</td>
<td>0.3</td>
<td>0.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>6.8</td>
<td>6.8</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Source: U.S. Energy Information Administration, based on ClipperData. Saudi Arabia ramped output capacity on its existing pipelines to drive up the crude oil prices. Note: Unused capacity is defined as pipeline capacity that is not currently used. (See can be readily available."

Based on tanker tracking data published by ClipperData, Saudi Arabia moves the most crude oil and condensate through the Strait of Hormuz, most of which is exported to other countries (less than 0.5 million bpd transited the Strait in 2018 from Saudi ports to other Gulf countries).

EIA estimates that 76% of the crude oil and condensate that moved through the Strait of Hormuz went to Asian markets in 2018. China, India, Japan, South Korea, and Singapore were the largest destinations for crude oil moving through the Strait of Hormuz to Asia, accounting for 83% of all Hormuz crude oil and condensate flows in 2018.

### Volume of crude oil and condensate transported through the Strait of Hormuz by origin and by destination

<table>
<thead>
<tr>
<th>Country</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
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<tbody>
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<td>Saudi Arabia</td>
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<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
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<td>United Arab Emirates</td>
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<td>Other Asia</td>
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<td>0.1</td>
<td>0.1</td>
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<tr>
<td>Other Asia</td>
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<td>Other Asia</td>
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Source: U.S. Energy Information Administration, based on tanker tracking data published by ClipperData, Inc.

In 2018, the United States imported about 1.4 million bpd of crude oil and condensate from Persian Gulf countries through the Strait of Hormuz, accounting for about 15% of total U.S. crude oil and condensate imports and 7% of total U.S. petroleum liquids consumption.
The Strategic Importance of the Bab el-Mandeb

The Bab el-Mandeb Strait is a sea route chokepoint between the Horn of Africa and the Middle East, connecting the Red Sea to the Gulf of Aden and Arabian Sea. Most exports of petroleum and natural gas from the Persian Gulf that transit the Suez Canal or the SUEMED Pipeline pass through both the Bab el-Mandeb and the Strait of Hormuz.

Chokepoints are narrow channels along widely used global sea routes that are critical to global energy security. The Bab el-Mandeb Strait is 18 miles wide at its narrowest point, limiting tanker traffic to two 2-mile-wide channels for inbound and outbound shipments.

Closure of the Bab el-Mandeb Strait could keep tankers originating in the Persian Gulf from transiting the Suez Canal or reaching the SUEMED Pipeline, forcing them to divert around the southern tip of Africa, which would increase transit time and shipping costs.

In 2016, an estimated 3.2 million barrels per day (b/d) of crude oil, condensate, and refined petroleum products flowed through the Bab el-Mandeb Strait toward Europe, the United States, and Asia, an increase from 3.1 million b/d in 2014. Total petroleum flows through the Bab el-Mandeb Strait accounted for about 9% of total crude-oil and refined petroleum products imports in 2017. About 3.6 million b/d moved northward to Europe; another 2.8 million b/d flowed in the opposite direction mainly to Asian markets such as Singapore, China, and India.

Source: adapted from Justine Barden, "The Bab el-Mandeb Strait is a strategic route for oil and natural gas shipments," Energy Today, August 27, 2019, https://www.eia.gov/todayinenergy/detail.php?id=41073
The Strategic Importance of the SUMED Pipeline and Suez Canal - I

The Suez Canal and the SUMED Pipeline are strategic routes for Persian Gulf crude oil, petroleum products, and liquefied natural gas (LNG) shipments to Europe and North America. Located in Egypt, the Suez Canal connects the Red Sea with the Mediterranean Sea, and it is a critical chokepoint because of the large volumes of energy commodities that flow through it.

Chokepoints are narrow channels along widely used global sea routes that are critical to global energy security. Total oil flows through the Suez Canal and the SUMED pipeline accounted for about 9% of total seaborne traded petroleum (crude oil and refined petroleum products) in 2017, and LNG flows through the Suez Canal and the SUMED pipeline accounted for about 8% of global LNG trade.


Source: U.S. Energy Information Administration
The Strategic Importance of the SUMED Pipeline and Suez Canal - II

Northbound crude oil flows decreased in 2018 for several reasons:

- Higher U.S. crude oil exports displaced Persian Gulf crude oil that had been historically sent to Europe.
- Key Middle East producers, mainly Saudi Arabia and Iraq, have been increasing crude oil exports to China and other growing Asian oil markets using eastbound routes rather than the Suez Canal.
- Renewed U.S. oil sanctions on Iran, imposed in late 2018, contributed to a decrease in Iran’s crude oil exports to Europe.

Southbound crude oil shipments, mainly to Asian markets such as Singapore, China, and India, have more than doubled in the past two years. Petroleum exports from Russia accounted for the largest share (24%) of Suez southbound petroleum traffic. Increases in Libya’s crude oil production and exports in 2018 also contributed to a rise in southbound shipments. In the past two years, increased production and exports of U.S. crude oil and petroleum products—especially liquefied petroleum gas—have also increased southbound traffic through the canal.

Overall LNG flows through the Suez Canal have declined in recent years. Nearly all (98%) of the northbound LNG traffic is from Qatar and mainly destined for European markets. Although Qatar remains a key exporter of LNG through the canal, it has been diverting more cargoes to Asia in recent years.

Changes in LNG traffic through the Suez Canal also reflect the growth in U.S. shale gas production and LNG exports, falling LNG demand in some European countries, and competition for LNG in the global market, especially in Asia.

Major Gulf-Wide Petroleum Targets
Major Gulf-Wide Urban Targets

Petroleum Targets Near strait of Hormuz

Source: https://www.google.com/search?q=map+of+Persian+Gulf+waters&client=firefox-b-1-d&sourceid=chrome&ie=UTF-8&sa=X&ved=2ahUKEwjOlpO9x9rAhUoJiz4HHTpMDwQzwEwBnAAY#imgrc=O-nfXNHw9VFZM
Major Iranian Petroleum Targets

Source: https://www.google.com/search?q=map+of+Persian+Gulf+oil+facilities&client=firefox-b-1-d&source=iu&ictx=1&fir=4_00APtkiVoMwM%25253A%2525253A2CylawVXbdLUkCM%2525253A2C&vet=1&url=A4d_kR-QfQgcHl8ka4nv5ub8yijG-4g&sa=X&ved=2ahUKEwjR5cqWqsHlAhWhvJKKwv9K2iwoA3oECAAYQDw#imgrc=4_00APtkiVoMwM
Nationwide Saudi Petroleum Targets

Figure 6. Saudi Arabia major oil and natural gas infrastructure

Source: EIA https://www.eia.gov/beta/international/analysis.php?iso=SAU
Oil Tank Farm at Ras Tanura

Nationwide UAE Petroleum Targets

Source: https://www.eia.gov/beta/international/analysis.php?iso=ARE