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# Iran, the Gulf, and Strategic Competition: Key Scenarios

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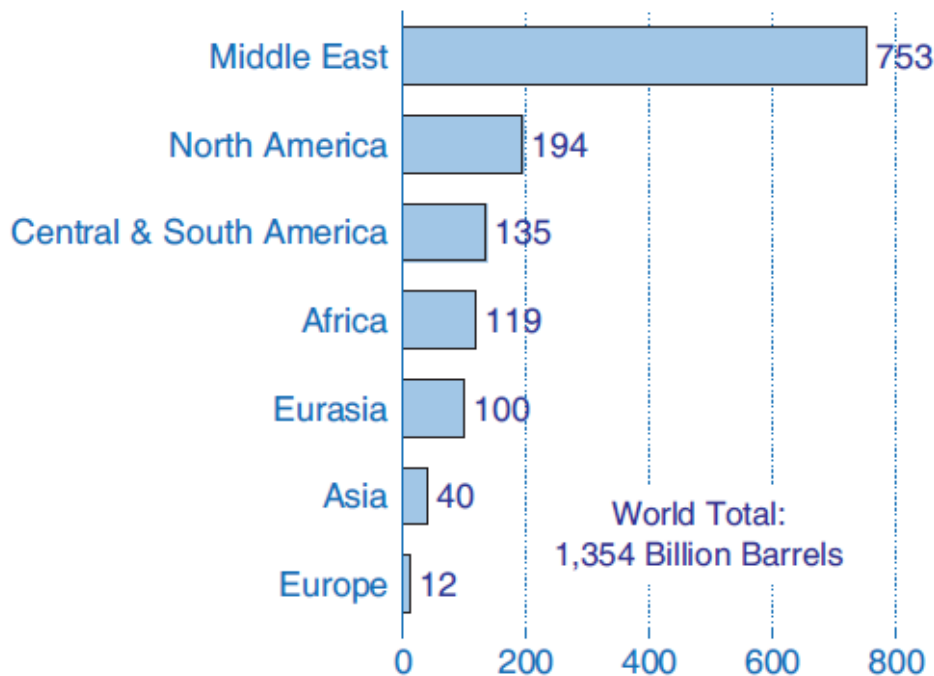
Burke Chair  
in Strategy

*Revised August 10,  
2010*

# *The Energy Scenarios that Shape the Threat*

# Proven World Oil Reserves

(In billions of barrels)



Source: *Oil & Gas Journal*.

Country	Oil reserves	Percent of world total
Saudi Arabia . . . . .	259.9	19.20
Canada . . . . .	175.2	12.94
Iran . . . . .	137.6	10.16
Iraq . . . . .	115.0	8.50
Kuwait . . . . .	101.5	7.50
Venezuela . . . . .	99.4	7.34
United Arab Emirates . . .	97.8	7.22
Russia . . . . .	60.0	4.43
Libya . . . . .	44.3	3.27
Nigeria . . . . .	37.2	2.75
Kazakhstan . . . . .	30.0	2.22
Qatar . . . . .	25.4	1.88
China . . . . .	20.4	1.51
United States . . . . .	19.2	1.42
Brazil . . . . .	12.8	0.95
Algeria . . . . .	12.2	0.90
Mexico . . . . .	10.4	0.77
Angola . . . . .	9.5	0.70
Azerbaijan . . . . .	7.0	0.52
Norway . . . . .	6.7	0.49
Rest of World . . . . .	72.2	5.33
<b>World Total . . . . .</b>	<b>1,353.7</b>	<b>100.00</b>

Source: *Oil & Gas Journal*.

## EIA Projections by Key Gulf Country - I

**Saudi Arabia** remains the largest liquids producer in OPEC, with total production increasing from 10.3 million barrels per day in 2007 to 15.1 million barrels per day in 2035, as prices stabilize at historically high levels and world consumption continues to grow.

Thirty percent of the increase (1.4 million barrels per day) is expected to be NGPL production related to expansion of natural gas production.

The total production increase equates to an average annual growth rate of 1.4 percent, based on the assumption that Saudi Arabia will continue with its current plan to maintain spare production capacity at levels between 1.5 and 2.0 million barrels per day, restricted by political rather than resource-related factors.

The political factors include the effectiveness of the national oil company's operations, the ability of the government and foreign investors to agree on contractual terms, and continuing financial sanctions.

Total liquids production in **Iran** is expected to be restricted by political rather than resource-related factors. The political factors include the effectiveness of the national oil company's operations, the ability of the government and foreign investors to agree on contractual terms, and continuing financial sanctions.

In the IEO- 2010 Reference case, Iran's oil production declines from 2007 through 2035 because of both financial and political constraints on the development of new oil and natural gas prospects. In addition, the projections anticipate that natural gas demand for domestic electric power and heat production will limit the amount of natural gas available for improving oil recovery through natural gas reinjection.

Political factors and investment constraints affect Iran's liquids production so severely that production in 2035 varies by 2.7 million barrels per day across the IEO2010 projections, from 2.6 million barrels per day in the High Oil Price case to 5.3 million barrels per day in the Low Oil Price case.

## EIA Projections by Key Gulf Country - II

**Iraq** increases its liquids production by 3.9 percent per year in the IEO2010 Reference case.. the projection assumes that political, legislative, logistical, investment, and security uncertainties in Iraq will be resolved in the long term, and that OPEC constraints and resource availability will be the factors with the strongest influence on Iraq's willingness and ability to increase production.

In addition to political and legislative uncertainty, import and export infrastructure are also expected to limit production growth in Iraq to 0.5 million barrels per day from 2007 to 2015. If the country is able to achieve long-term political and economic stability and expand the capacity of import and export routes as projected in the Reference case, investment in production capacity could rise by an average of 5.2 percent annually from 2015 and 2030 before slowing to a more modest 3.8 percent per year from 2030 to 2035.

The fact that Iraq has the resources necessary to support such growth in the long run, yet produced only 2.1 million barrels per day in 2007, illustrates the significant impacts that the political environment and other above-ground constraints can have on production projections. In 2035 varies by 2.7 million barrels per day across the IEO2010 projections, from 2.6 million barrels per day in the High Oil Price case to 5.3 million barrels per day in the Low Oil Price case.

EIA analysis suggests that, even in a stable political and security climate, it would be extremely difficult to raise production by nearly 10 million barrels per day over such a short period. ...The proposed pace and scale of Iraq's planned production expansion defy historical precedents and ignore a long list of logistical and political impediments.

The uncertainty associated with the evolution of Iraq's upstream oil sector is reflected in the range of projections for liquids production in 2035. In the Reference case, the political and security situation in Iraq stabilizes, and a few of the operating companies overcome, in some measure, the obstacles they face. In this case, Iraq's total liquids production rises to 2.8 million barrels per day in 2017 and 6.1 million barrels per day in 2035.

In the IEO2010 Low Oil Price case, Iraq's total liquids production reaches 8.3 million barrels per day by 2035, reflecting greater success in addressing the considerable difficulties facing oil industry expansion.

In the High Oil Price case, liquids production reaches only 4.2 million barrels per day in 2035, because companies to a great extent are unable to reduce the difficulties they face in their attempts to increase production.

## EIA Projections by Key Gulf Country - III

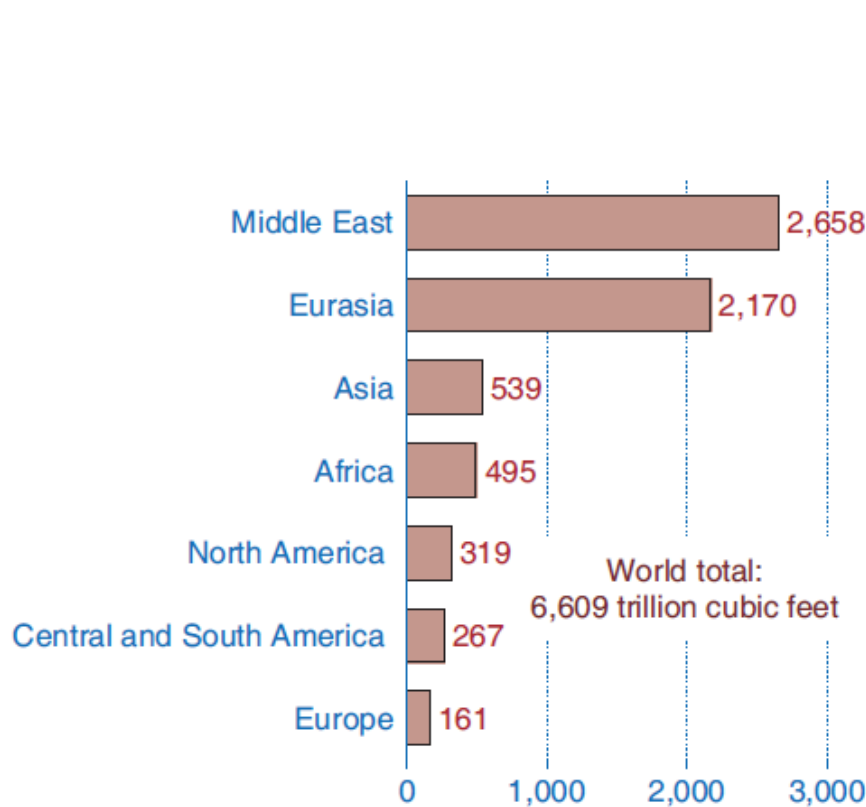
**Qatar** has the second-highest average annual growth rate in total liquids production among OPEC nations from 2007 to 2035 in the Reference case, at 3.3 percent, with total volumes increasing from 1.2 million barrels per day in 2007 to 2.5 million barrels per day in 2035.

About one-half of the increase consists of crude oil and lease condensate production; production of NGPLs contributes another 0.4 million barrels per day; and GTL projects add just over 0.2 million barrels per day.

Despite the current negative outlook for many previously announced GTL projects around the world, the return and persistence of historically high oil prices in the Reference case supports the operation of Qatar's Pearl facility (0.1 million barrels per day capacity) and expansion of its Oryx facility (adding another 0.1 million barrels per day.)

# Proven World Gas Reserves

(In trillions of cubic feet)



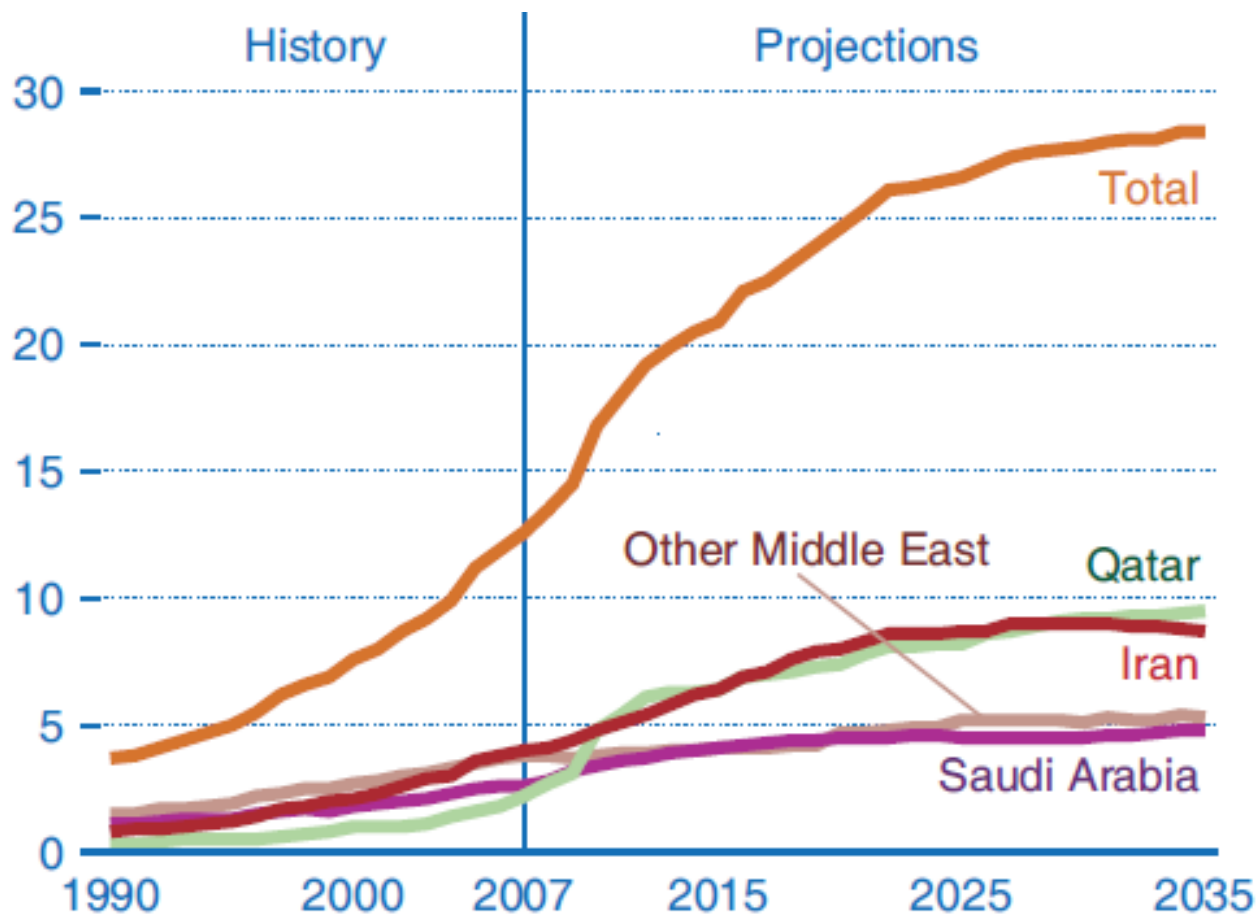
Source: *Oil & Gas Journal*.

Country	Reserves (trillion cubic feet)	Percent of world total
World	6,609	100.0
Top 20 Countries	6,003	90.8
Russia	1,680	25.4
Iran	1,046	15.8
Qatar	899	13.6
Turkmenistan	265	4.0
Saudi Arabia	263	4.0
United States	245	3.7
United Arab Emirates	210	3.2
Nigeria	185	2.8
Venezuela	176	2.7
Algeria	159	2.4
Iraq	112	1.7
Australia	110	1.7
China	107	1.6
Indonesia	106	1.6
Kazakhstan	85	1.3
Malaysia	83	1.3
Norway	82	1.2
Uzbekistan	65	1.0
Kuwait	63	1.0
Canada	62	0.9
Rest of World	606	9.2

Source: *Oil & Gas Journal*.

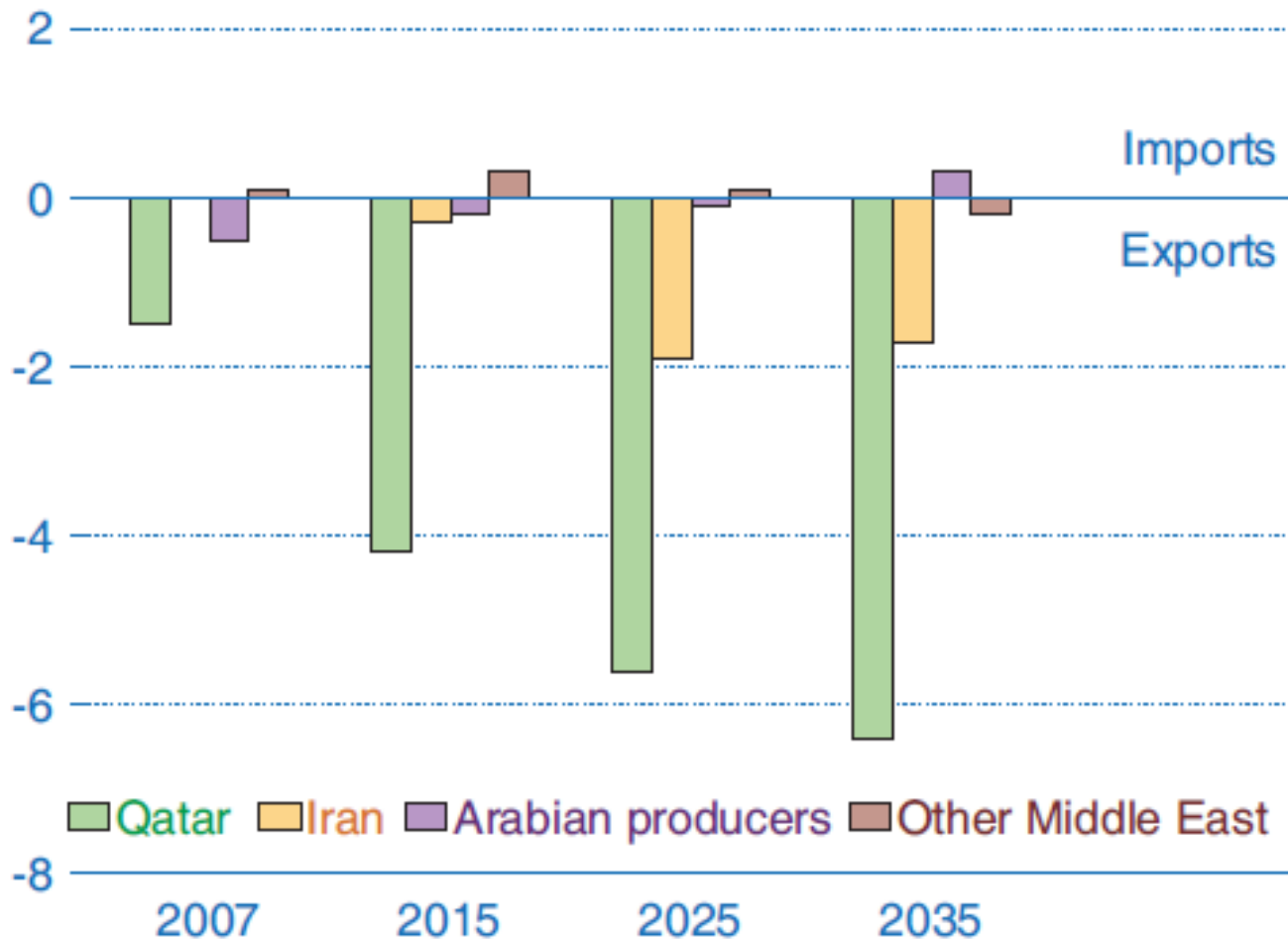
# Middle East Gas Production

(In trillions of cubic feet)



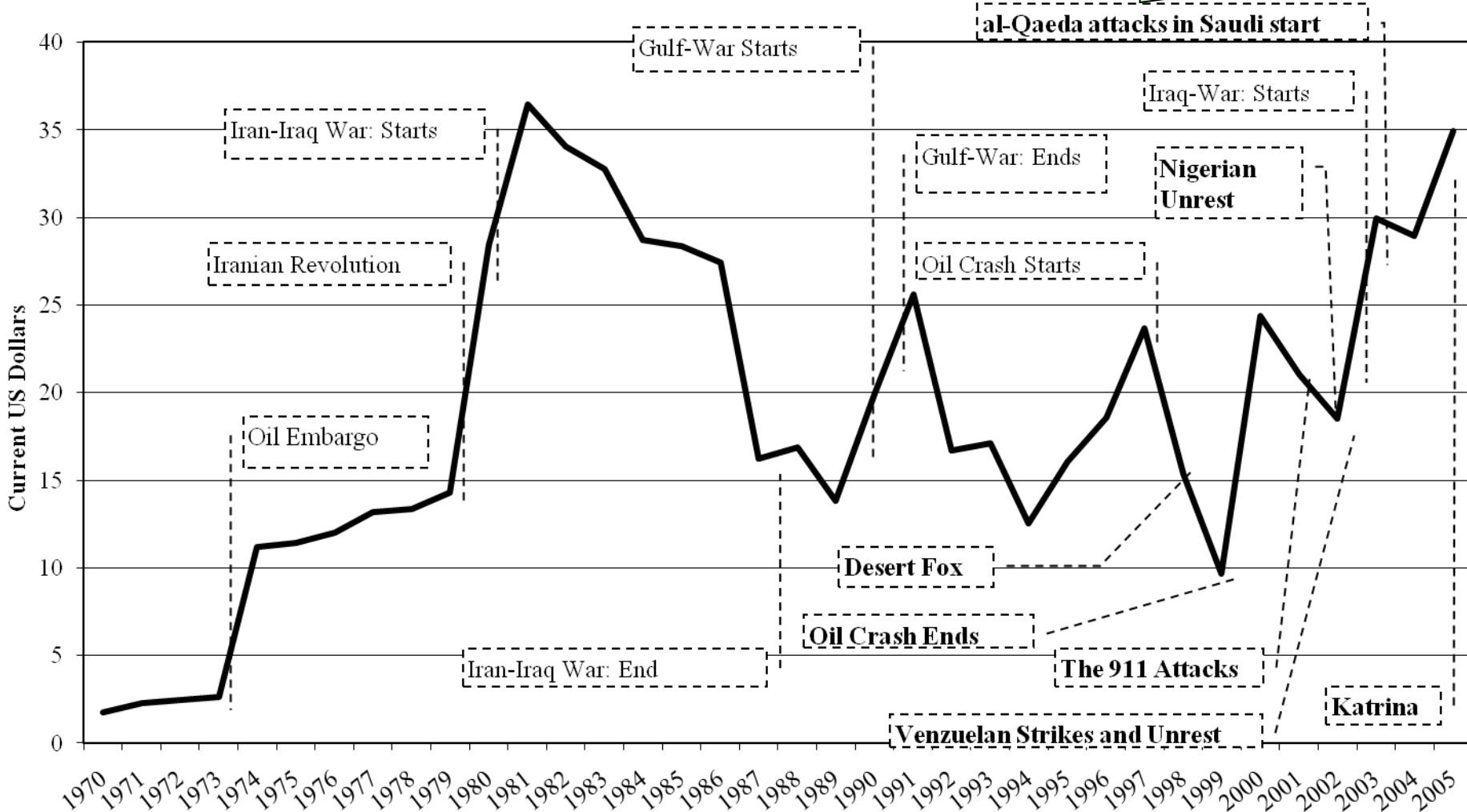


# Middle East Gas Exports (In trillions of cubic feet)



# Repeating History: Gulf-Driven Oil Shocks Before \$100 Oil

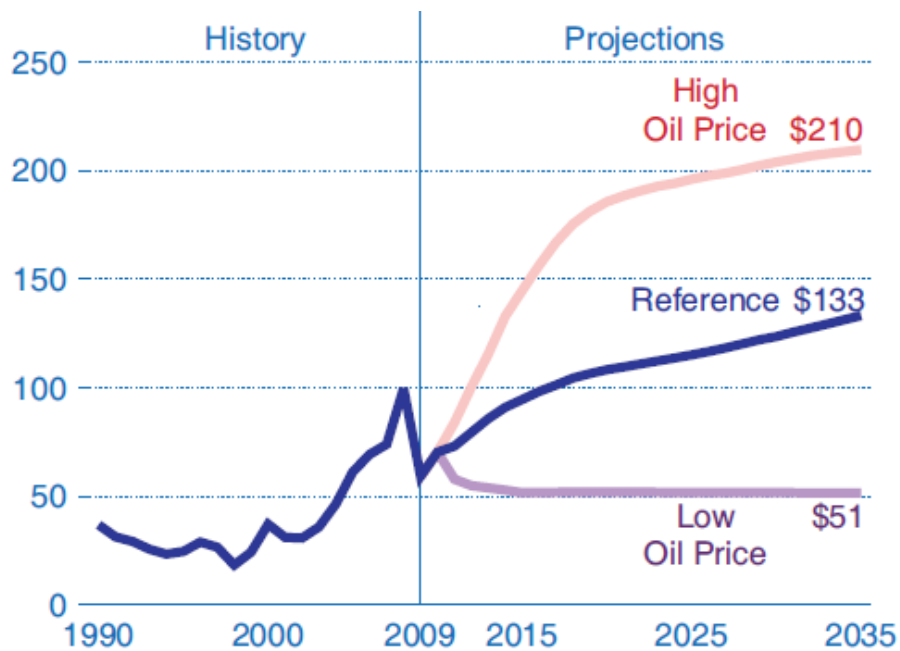
Overtimes: more incidents, more frequent volatility, higher risk of asymmetric attacks, and more geopolitical uncertainties.



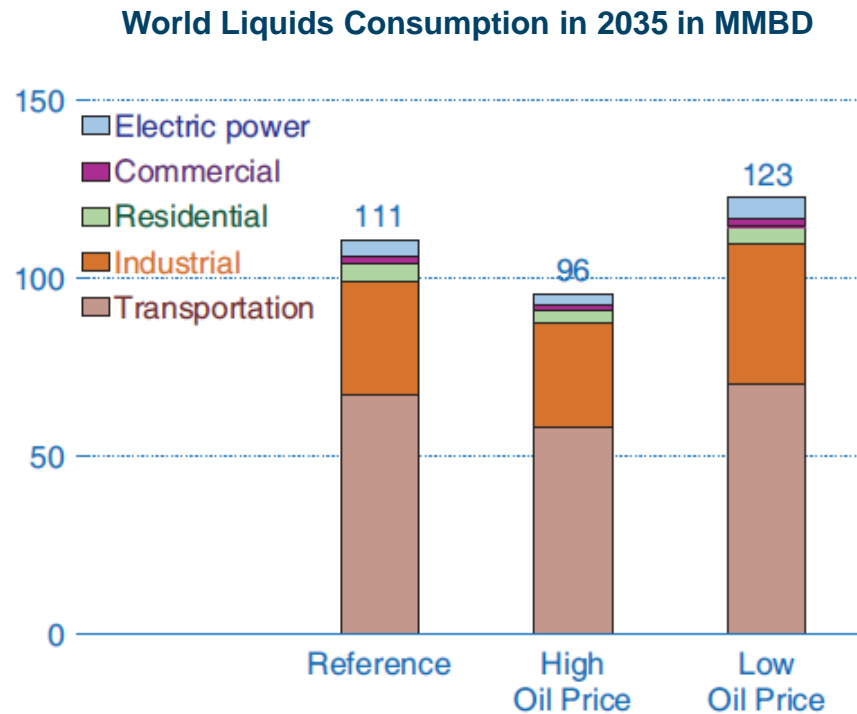
Source: EIA, "Crude Prices by Selected Type 1970-2005," <http://www.eia.doe.gov/emeu/aer/txt/ptb1107.html>.

Note: These prices are averages of several types: Saudi Light, Iranian Light, Libyan Es Sider, Nigerian Bonny Light, Indonesian Minas, Venezuelan Tia Juana light Mexico Maya, and UK Brent blend

## And a Far More Uncertain Future: EIA Estimates of Future World Oil Prices & Consumption

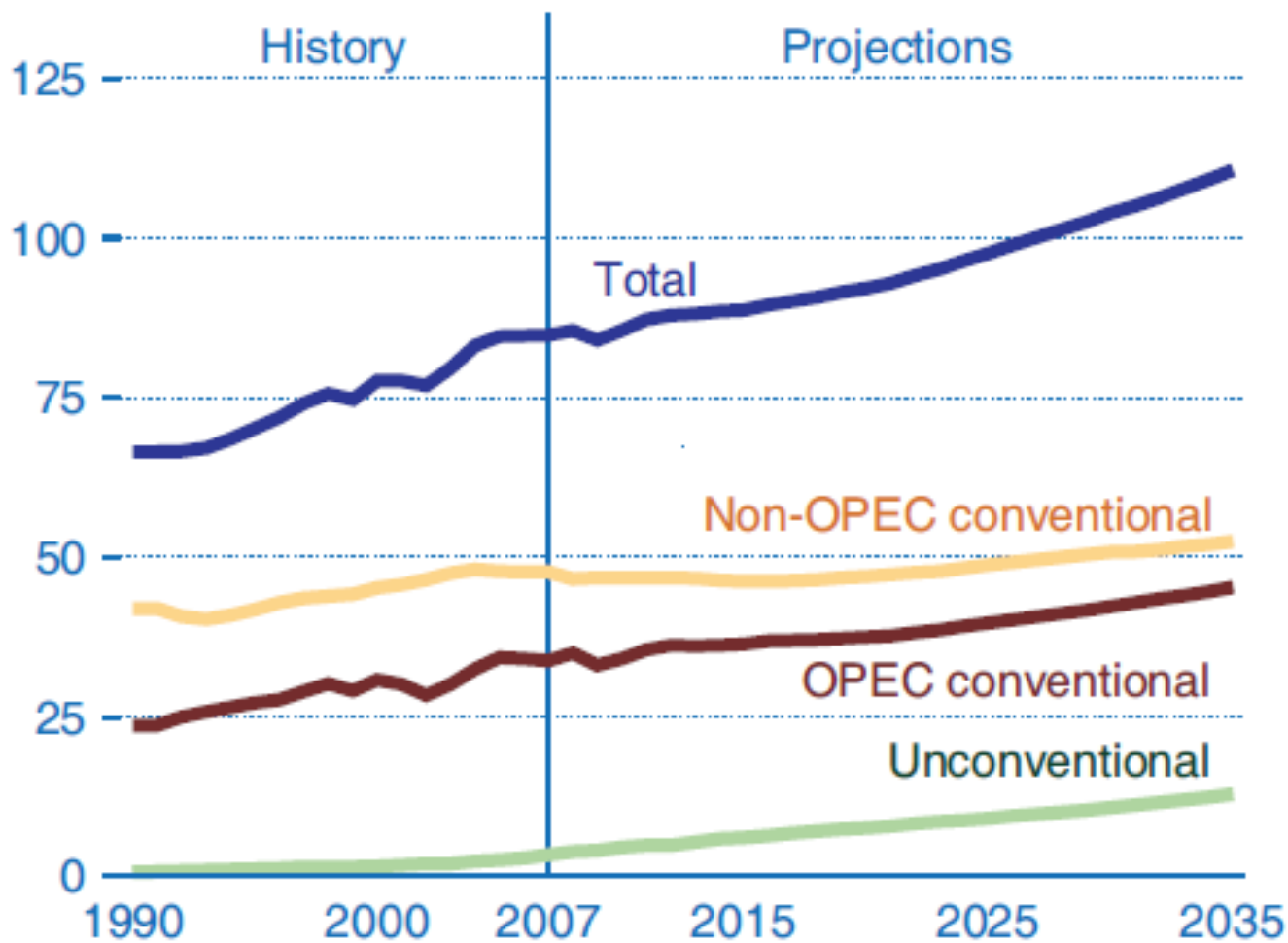


Source: EIA, *IEO 2010*, p. 20

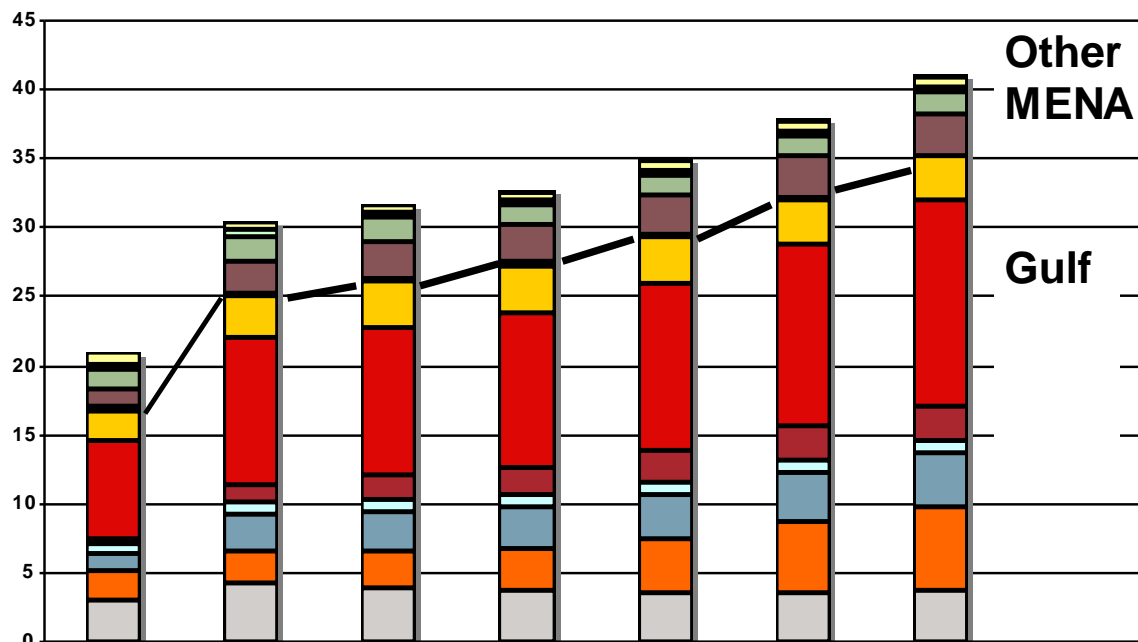


Source: EIA, *IEO 2010*, p. 21

# Steadily Rising Dependence on Gulf Oil



# EIA Projections of Gulf/ME Liquids Production By Country 1990-2035: In Millions of Barrels Per Day



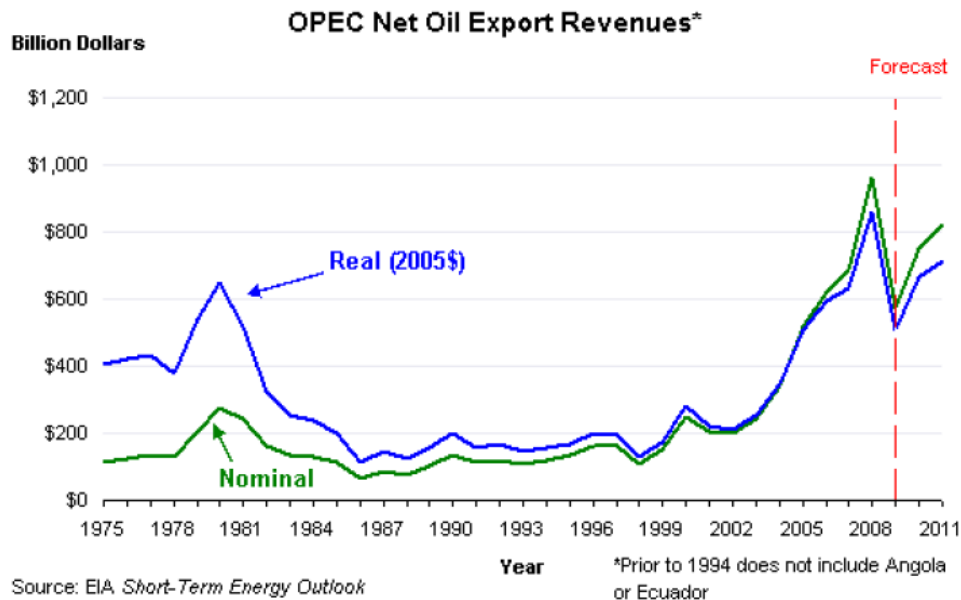
	1990	2008	2015	2020	2025	2030	2035	% Ave. Annual Change 07-35
█ Gulf Share of World	-	*28%	*28%	*29%	*29%	*30%	*31%*	-
█ Total World	-	*85.5	*88.7	*92.1	*97.6	*103.0	*110.5%	*1.0
█ Total MENA	-	*30.5	*31.6	*32.6	*35.0	*37.9	*41.0	
█ Other	-	0.1	0.1	0.1	0.2	0.2	0.2	*4.0
█ Egypt	0.9	0.6	0.5	0.6	0.7	0.7	0.7	*0.1
█ Syria	0.4	0.4	0.4	0.3	0.3	0.3	0.3	*-1.8
█ Libya	1.4	1.9	1.7	1.4	1.4	1.5	1.6	*-0.5
█ Algeria	1.3	2.2	2.6	2.8	2.9	3	3	*1.2
█ Yemen	0.2	0.3	0.2	0.2	0.2	0.1	0.1	*-2.9
█ Total Gulf	-	*25.0	*26.1	*27.2	*29.3	*32.1	*35.1	*1.4
█ UAE	2.3	3	3.4	3.4	3.4	3.2	3.1	*0.2
█ Saudi	7	10.7	10.7	11.2	12.1	13.3	15.1	*1.4
█ Qatar	0.4	1.2	1.8	2.1	2.3	2.5	2.5	*2.8
█ Oman	0.7	0.8	0.9	0.8	0.8	0.8	0.8	*0.2
█ Kuwait	1.2	2.7	2.9	3	3.2	3.6	3.9	*1.4
█ Iraq	2.1	2.4	2.6	3.1	3.9	5.1	6.1	*3.9
█ Iran	3.1	4.2	3.9	3.7	3.6	3.6	3.7	*1.4

## **EIA Projections of Gulf/ME Liquids Production By Country 1990-2035**

**In Millions of Barrels Per Day**

	1990	2008	2015	2020	2025	2030	2035	% Ave. Annual
Iran	3.1	4.2	3.9	3.7	3.6	3.6	3.7	*1.4
Iraq	2.1	2.4	2.6	3.1	3.9	5.1	6.1	*3.9
Kuwait	1.2	2.7	2.9	3	3.2	3.6	3.9	*1.4
Om an	0.7	0.8	0.9	0.8	0.8	0.8	0.8	*0.2
Qatar	0.4	1.2	1.8	2.1	2.3	2.5	2.5	*2.8
Saudi	7	10.7	10.7	11.2	12.1	13.3	15.1	*1.4
UAE	2.3	3	3.4	3.4	3.4	3.2	3.1	*0.2
<b>Total Gulf</b>	-	<b>*25.0</b>	<b>*26.1</b>	<b>*27.2</b>	<b>*29.3</b>	<b>*32.1</b>	<b>*35.1</b>	<b>*1.4</b>
Yemen	0.2	0.3	0.2	0.2	0.2	0.1	0.1	*-2.9
Algeria	1.3	2.2	2.6	2.8	2.9	3	3	*1.2
Libya	1.4	1.9	1.7	1.4	1.4	1.5	1.6	*-0.5
Syria	0.4	0.4	0.4	0.3	0.3	0.3	0.3	*-1.8
Egypt	0.9	0.6	0.5	0.6	0.7	0.7	0.7	*0.1
Other	-	0.1	0.1	0.1	0.2	0.2	0.2	*4.0
<b>Total MENA</b>	-	<b>*30.5</b>	<b>*31.6</b>	<b>*32.6</b>	<b>*35.0</b>	<b>*37.9</b>	<b>*41.0</b>	
<b>Total World</b>	-	<b>*85.5</b>	<b>*88.7</b>	<b>*92.1</b>	<b>*97.6</b>	<b>*103.0</b>	<b>*110.5%</b>	<b>*1.0</b>
<b>Gulf Share of W-</b>		<b>*28%</b>	<b>*28%</b>	<b>*29%</b>	<b>*29%</b>	<b>*30%</b>	<b>*31%*</b>	-

# Trends in Gulf Oil Revenues: 1975-2011



Source: EIA, *Short-Term Energy Outlook*

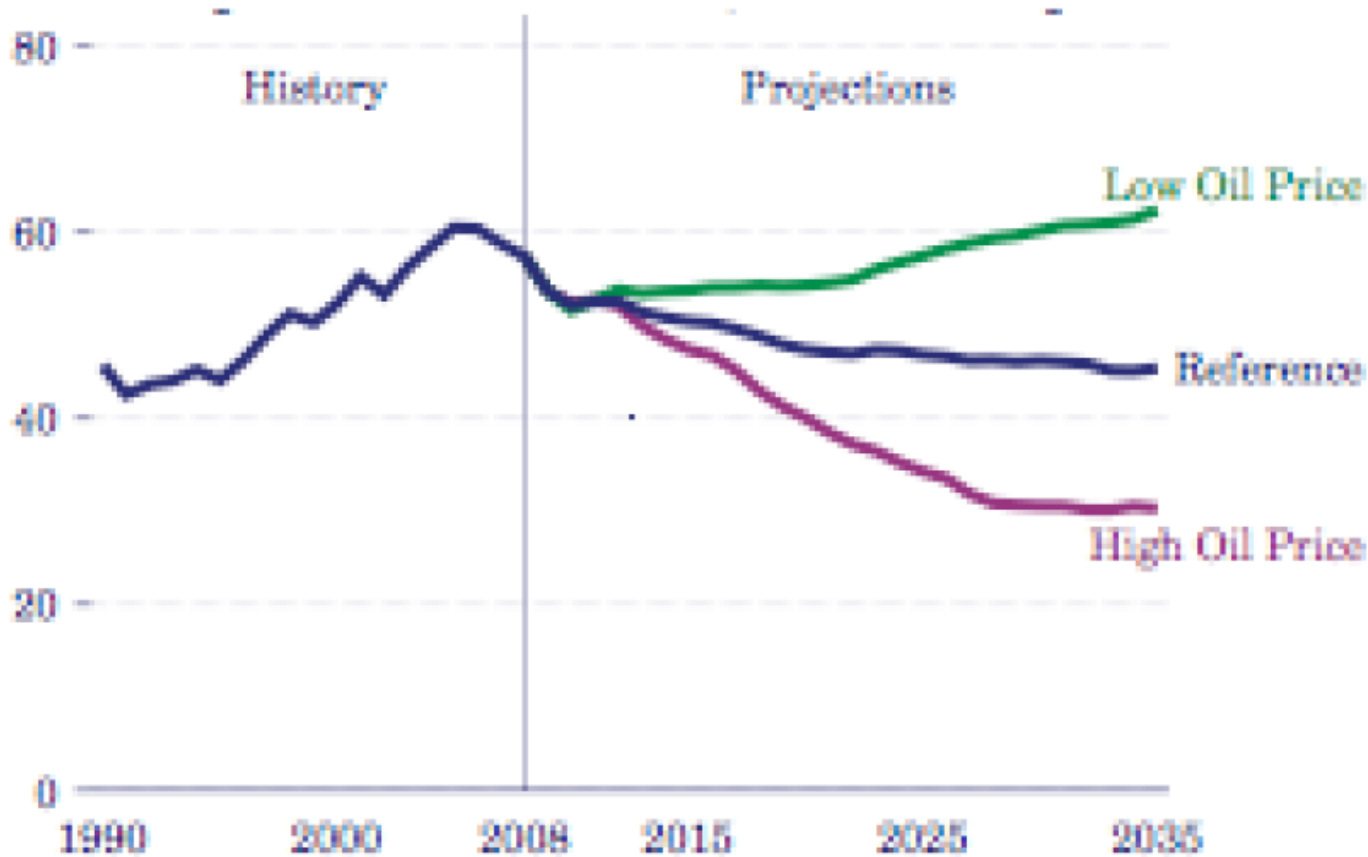
## OPEC Net Oil Export Revenues

Country	Nominal (Billion \$)			Real (Billion 2005\$)				
	2009	2010	2011	Jan-Jul 2010	2009	2010	2011	Jan-Jul 2010
Algeria	\$42	--	--	\$31	\$38	--	--	\$28
Angola	\$42	--	--	\$33	\$38	--	--	\$29
Ecuador	\$6	--	--	\$4	\$5	--	--	\$4
Iran	\$53	--	--	\$41	\$48	--	--	\$36
Iraq	\$38	--	--	\$28	\$34	--	--	\$25
Kuwait	\$45	--	--	\$33	\$40	--	--	\$29
Libya	\$34	--	--	\$25	\$31	--	--	\$22
Nigeria	\$46	--	--	\$38	\$41	--	--	\$33
Qatar	\$24	--	--	\$20	\$21	--	--	\$18
Saudi Arabia	\$153	--	--	\$116	\$137	--	--	\$102
UAE	\$53	--	--	\$38	\$47	--	--	\$34
Venezuela	\$33	--	--	\$22	\$30	--	--	\$20
<b>OPEC</b>	<b>\$571</b>	<b>\$752</b>	<b>\$821</b>	<b>\$429</b>	<b>\$510</b>	<b>\$662</b>	<b>\$711</b>	<b>\$378</b>

## OPEC Per Capita Net Oil Export Revenues

Country	Nominal (\$)				Real (2005\$)			
	2009	2010	2011	Jan-Jul 2010	2009	2010	2011	Jan-Jul 2010
Algeria	\$1,243	--	--	\$907	\$1,110	--	--	\$800
Angola	\$3,292	--	--	\$2,526	\$2,940	--	--	\$2,229
Ecuador	\$411	--	--	\$279	\$367	--	--	\$247
Iran	\$804	--	--	\$612	\$719	--	--	\$540
Iraq	\$1,305	--	--	\$943	\$1,166	--	--	\$832
Kuwait	\$16,683	--	--	\$12,015	\$14,907	--	--	\$10,602
Libya	\$5,418	--	--	\$3,884	\$4,841	--	--	\$3,427
Nigeria	\$326	--	--	\$260	\$291	--	--	\$230
Qatar	\$25,205	--	--	\$20,711	\$22,516	--	--	\$18,275
Saudi Arabia	\$5,339	--	--	\$3,973	\$4,770	--	--	\$3,506
UAE	\$10,955	--	--	\$7,716	\$9,788	--	--	\$6,809
Venezuela	\$1,238	--	--	\$824	\$1,106	--	--	\$727

# Net Import Share of U.S. Liquid Fuels Consumption, 1990-2035 (2010 Estimate) in Percent





## Scenario 2: US Naval Blockade and Panic in the Oil Markets

*Iran responds to new UN and US sanctions by starting a series of low level IRGC naval branch attacks on Gulf shipping, and uses its Al Quds force and Vevak's ties to extremists in Iraq and Lebanon to conduct terrorist attacks on US targets. The US responds with a naval embargo of Iran and by creating a no fly zone for Iranian aircraft in the Gulf.*

*Iran places limited numbers of smart mines near the Strait and in the Gulf of Oman. IRGC naval branch vessels sporadically attack tankers in quick, disperse raises throughout the Gulf. Iran places smart mines and free floating mines in the Gulf area, and release oil into the Gulf.*

*These actions do not close the Gulf, but create a near panic in terms of world oil markets and shipping into the region. Tension and panic is raised to a brief peak when Iran fires a land-based anti-ship missile at a British destroyer passing through the Gulf to aid the USN.*

*Turkey mediates a cease fire after about 10 days. It does not change the basic military situation, or bring a halt to Iranian proliferation or missile developments.*

## Scenario 1: Sanctions but No Attack

*Iran ignores new UN sanctions, and the US discovers new tunnels and centrifuges facilities that it associated with Iran's nuclear program. Iran refuses any IAEA access, and tests a series of long-range solid fuel and liquid fuel missiles. The Obama Administration comes under intense pressure from the Congress, Israel, and other allies to act. It announces US sanctions against any financial institution deal with Iran and a naval embargo against any shipments of gasoline and product to Iran.*

*Iran responds by halting all oil exports, and threatens to close the Gulf. IRGC naval branch vessels fire on a tanker and Iranian Navy ships and P-3s come close to the US ships enforcing the embargo. This triggers a major rise in insurance premiums and shipping costs for all traffic into the Gulf, as well as leads the US and GCC states to put there forces in the region on full alert. Tensions rise as Israel again threatens to strike.*

*The result is Iran's exports through the Gulf are halted for several (two?) weeks, and there is considerable panic in the oil market. There is no violence, however, other than small clashes and incidents. No clear resolution takes place. Iran agrees to IAEA action but stalls and limits access. The US is not willing to sustain the crisis, The basic problems with proliferation continue.*

## **Scenario 3a: War With Coordinated Release of Oil From SPRs/ 3b War without Release or with Limited release of Oil from SPRs**

*Iran is found to have concealed higher levels of uranium enrichment and to have obtained some highly enriched material from a source in the FSU. Intelligence sources disclose it is actively working on nuclear weapons and suitable bomb and missile warhead designs. Moreover, evidence surfaces that Iran is conducting simulated nuclear weapons design tests using non-fissile material, and has mastered the technology for high explosive lenses and nuclear initiators.*

*US and UN sanctions and inspection efforts have failed, and Iran now seems likely to have its first nuclear weapon within a year and not 3-5 years. Iran, the US, and GCC states go on high alert and posture for conflict. Israel quietly prepares a major strike and executes it without warning against key Iranian facilities like Natanz. Israel minimizes flights through friendly Arab air space and penetrates through Syria, but this forces the other Arab states to condemn the strikes politically, and creates tensions between them and the US.*

*Iran threatens to destroy Israel and the US presence in the region. It responds with limited ballistic missile strikes on Israeli cities and on US bases in the Gulf – concentrating on Bahrain, but with a token strike at bases in Kuwait and Qatar. It also announces that it will attack the US and supporters of Israel by cutting off the flow of oil and gas through the Gulf.*

*Iran is able to use its submarines to place smart mines near the Strait and in the Gulf of Oman. It uses one of its sub to fire a homing torpedo at a tanker exiting into the Gulf of Oman. IRGC naval branch vessels sporadically attack tankers in quick, disperse raises throughout the Gulf. Iran places smart mines and free floating mines in the Gulf area, and release oil into the Gulf.*

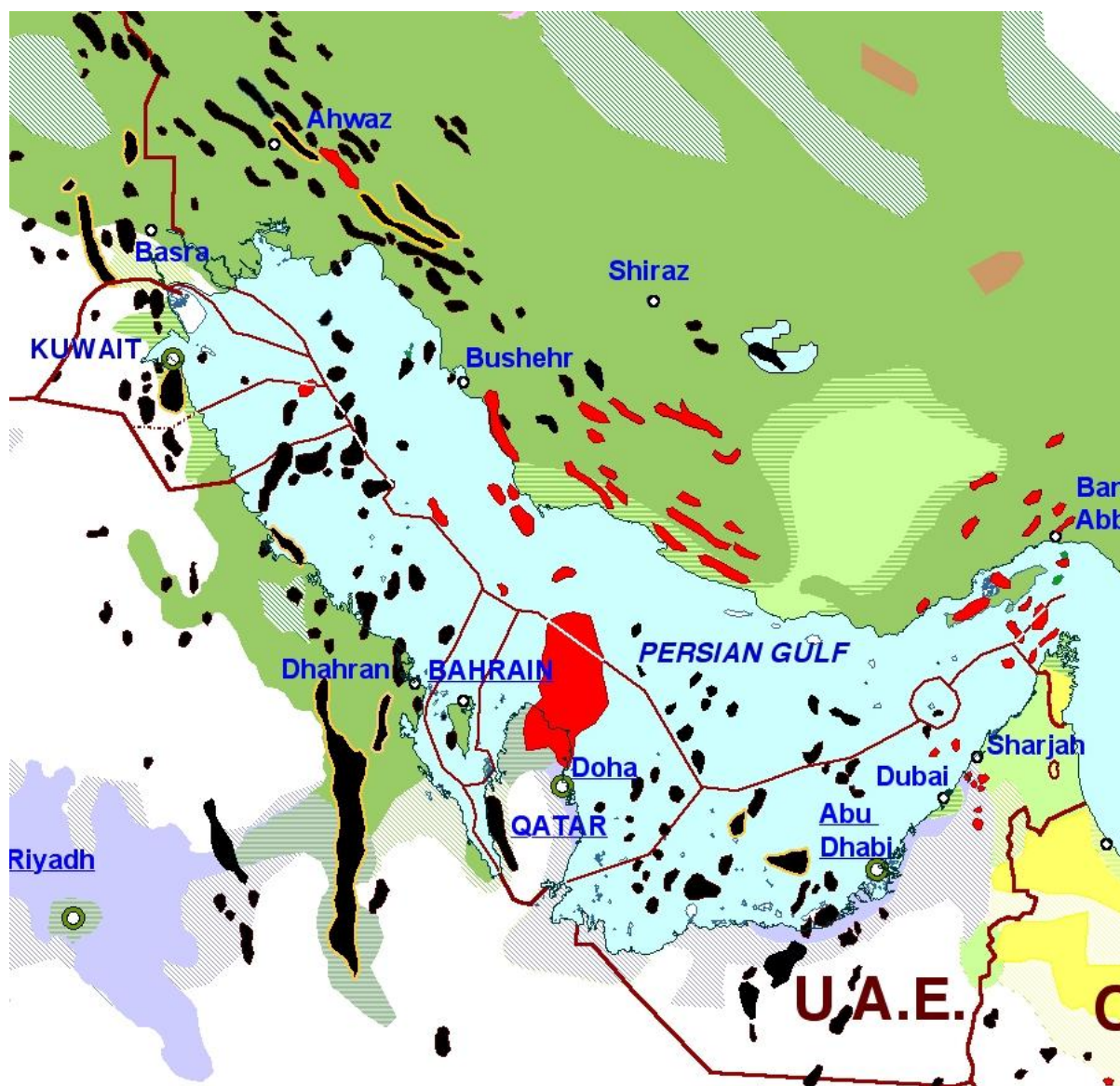
*This triggers a limited naval and air war by the US to destroy the Iranian threat inside and near the Gulf. Shipping halts for 5-7 days until the peak fighting is over, but risk premiums and tanker costs continue for 2-3 more weeks to average roughly 100% above normal. A series of panic attacks ensue during more intense clashes, and as Iran threatens unlimited war on the US and nations giving it bases. The Hezbollah begins a series of rocket strikes on Israel with Iranian and Syrian support, and Iran triggers significant increases in terrorist violence against US targets in Iraq and Afghanistan.*

*The conflict winds down slowly over time. There is no formal ceasefire. Iran declares that it has ceased to strike at Gulf targets and will concentrate on Israel and the lesser Satan. The US limits its actions to direct defense of Gulf shipping and the Gulf. Iran is allowed to resume exports and the GCC states and Iraq slowly resume their volume of shipping. Once again, the basic problem of Iranian proliferation is not solved. Iran is at most delayed by 1-2 years, and declares it has now been forced to build nuclear weapons because of the threat posed by a nuclear Israel and US.*

*The Conditions that Shape the  
Scenarios:*

*Challenge of Export Vulnerability:  
Petroleum Exports, Key Infrastructure,  
and Key Imports*








# Vulnerability of Gulf Oil Fields






**Primary Oil and Gas Deposits in the Middle East and the Shia Majority Areas.**

-  A Major Oil field
-  A Super-Giant Oil field
-  A Major Gas field

**Islam:**

-  Shiism (to include Alevis/Alawis)
-  Sunnism (Hanafi, Shafi'i, Maliki)
-  Hunbli
-  Ibadism
-  Christianity
-  Judaism
-  Other

-  Mixed population areas
-  Sparsely populated areas
-  Uninhabited areas

# But, There Are Some Alternative Routes



# Saudi Arabian Oil Fields



- 267 billion barrels of oil reserves
- 9.7 MMBD production
- Capacity 10.5-11 MMBD growing to 12.5 MMBD.
- Exports 7/9-98.5 MBD, 52% to Asia
- 2.3 MMBD used domestically.
- Refinery throughput capacity of 2.1 MMBD
- 100 major oil and gas fields
- Ras Tanura complex has approximately 6 million bbl/d capacity; and the world's largest offshore oil loading facility. Includes the 2.5-million bbl/d port at Ras Tanura.
- More
- than 75 percent of exports are loaded at Ras Tanura Facility.
- 3 to 3.6-million bbl/d Ras al-Ju'aymah facility on the Persian Gulf.
- Yanbu' terminal on the Red Sea, has loading capacity of approximately 4.5 million bbl/d crude and 2 million bbl/d for NGL and products.

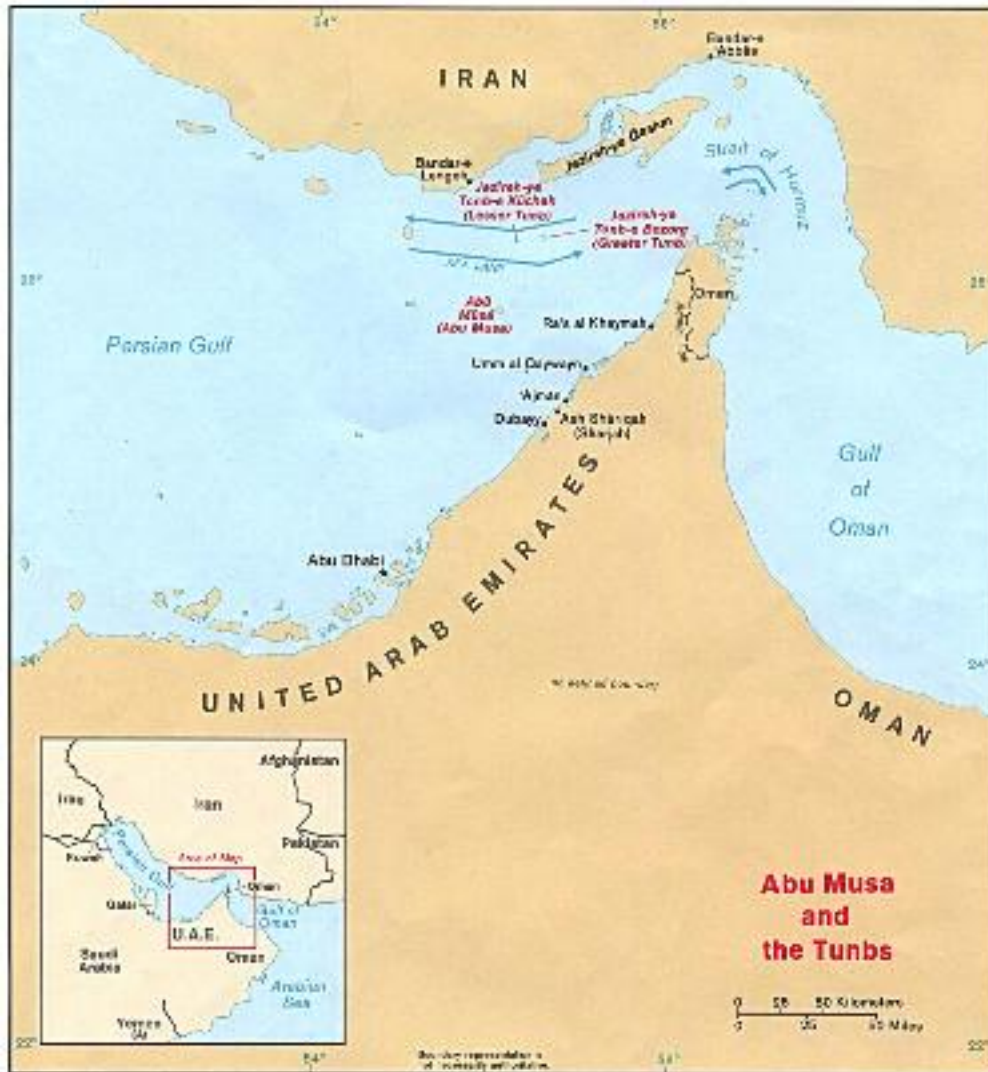
EIA, Country Briefs, "Saudi Arabia," August 2008

## Energy Infrastructure is Critical, *But*

- **Steadily rising global demand for Gulf crude, product, and gas**
- **Rising Asian demand (much exported indirectly to the West)**
- *Heavy concentrations in facilities designed to economies of scale, not redundancy.*
- *Poor response planning, and long-lead time replacement for critical key components.*
- *Day-to-day use often near limits of capacity*
- *Lack of systems integration and bypass capability at national and GCC level*
- *Improving lethality and range of precision strike systems.*
- *Smarter saboteurs and terrorists.*



# Hormuz: Breaking the Bottle at the Neck



- 280 km long, 50 km wide at narrowest point.
- Traffic lane 9.6 km wide, including two 3.2 km wide traffic lanes, one inbound and one outbound, separated by a 3.2 km wide separation median
- Antiship missiles now have ranges up to 150 km.
- Smart mines, guided/smart torpedoes,
- Floating mines, small boat raids, harassment.
- Covert as well as overt sensors.

# Abu Musa, Tumbs, Hormuz: Factoids

- **34 miles (55 KM) wide at narrowest part.**
- **Channels consist of 2-mile (3.2 km) navigable channels for inbound and outbound traffic, separated by 2-mile wide buffer zone.**
- **40% of all globally traded oil supply.**
- **75%-plus of Japan's oil/**
- **13.4 MMBD of crude through Strait in May 2007**
- **Additional 2 MMBD of products and over 31 million tons of LNG.**
- **90% of all Gulf exports go through Strait.**
- **EIA predicts exports will double to 30-34 MMBD by 2020**
- **Gulf will export 40% of world's LNG by 2015.**

## Iranian Assets for “Closing the Gulf”

- **3 Kilo (Type 877) and unknown number of midget (Qadr-SS-3) submarines; smart torpedoes, (anti-ship missiles?) and smart mine capability.**
- **Use of 5 minelayers, amphibious ships, small craft, commercial boats.**
- **Attacks on tankers, shipping, offshore facilities by naval guards.**
- **Raids with 8 P-3MP/P-3F Orion MPA and combat aircraft with anti-ship missiles:(C-801K (8-42 km), CSS-N-4, and others).**
- **Free-floating mines, smart and dumb mines, oil spills.**
- **Land-based, long-range anti-ship missiles based on land, islands (Seersucker HY-2, CSS-C-3), and ships (CSS-N-4, and others).**
- **IRGC raids on key export facility(ties).**
- **Iranian built Nasr-2 ship based SSM.**

# The Entire Gulf: Breaking the Bottle at Any Point



## Key Gulf-Related Chokepoints - I

Important World Oil Transit Chokepoints						
Name	2006E oil flow (bbl/d)	Width at Narrowest Point	Oil Source Origin	Primary Destination	Past Disturbances	Alternative Routes
<b>The Strait of Hormuz</b>	16.5-17 million	21 miles	Persian Gulf Nations including Saudi Arabia, Iran, and UAE	Japan, The United States, Western Europe, other Asian countries	Sea mines were installed during the Iran-Iraq War in the 1980s. Terrorists threats post September 11, 2001.	745-mile long East-West Pipeline through Saudi Arabia to the Red Sea
<b>The Suez Canal/ Sumed Pipeline</b>	4.5 million	1,000 feet	Persian Gulf Nations, especially Saudi Arabia, and Asia	Europe and The United States	Suez Canal was closed for eight years after the Six-Day War in 1967. Two large oil tankers ran aground in 2007 suspending traffic.	Reroute around the southern tip of Africa (the Cape of Good Hope); additional 6,000 miles.

# Key Gulf-Related Chokepoints - II

Important World Oil Transit Chokepoints						
Name	2006E oil flow (bbl/d)	Width at Narrowest Point	Oil Source Origin	Primary Destination	Past Disturbances	Alternative Routes
<b>Bab el-Mandab</b>	3.3 million	18 miles	The Persian Gulf	Europe and The United States	USS Cole attack in 2000; French oil tanker in 2002, both attacks off the coast of Aden, Yemen	Northbound traffic can use the East-West oil pipeline through Saudi Arabia; Reroute around the southern tip of Africa (the Cape of Good Hope), additional 6,000 miles.
<b>The Turkish Straits</b>	2.4 million	0.5 mile	Caspian Sea Region	Western and Southern Europe	Numerous past shipping accidents due to the straits sinuous geography. Some terrorist threats were made after September 11, 2001.	No clear alternative; potential pipelines discussed including a 173-mile pipeline between Russia, Bulgaria, and Greece.

# The Bab El Mandab



- **3.3 MMBD per day with 25%+ growth over next decade.**
- **2.1 MMBD flows northbound through Suez Complex.**
- **18 miles wide with two 2 mile channels going each way.**
- **Only major bypass is Saudi East-West pipeline at 4.4 MMBD, but now fully used.**

Source: EIA, Country Briefs, World Oil Transit Chokepoints, January 2008

# Suez



Source: EIA, Country Briefs, World Oil Transit Chokepoints, January 2008

- An estimated 3.9 million bbl/d of oil flows northbound through the Suez Canal to the Mediterranean, while 0.6 million bbl/d travels southbound into the Red Sea.
- Over 3,000 oil tankers pass through the Suez Canal annually. With only 1,000 feet at its narrowest point, the Canal is unable to handle large tankers.
- Suez Canal Authority (SCA) has discussed widening and deepening to accommodate VLCCs and ULCCs.
- 200-mile long Sumed Pipeline, or Suez-Mediterranean Pipeline also provides a route by crossing the northern region of Egypt from the Ain Sukhna to the Sidi Kerir Terminal.
- The pipeline can transport 3.1 million bbl/d of crude oil., Nearly all of Saudi Arabia's northbound shipments (approximately 2.3 million bbl/d of crude) are transported through the Sumed pipeline.
- Closure would divert tankers around the southern tip of Africa, the Cape of Good Hope, adding 6,000 miles to transit time.



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# Iran, the Gulf, and Strategic Competition: The Conventional Balance

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INTERNATIONAL STUDIES

Burke Chair  
in Strategy

*Revised August 10,  
2010*

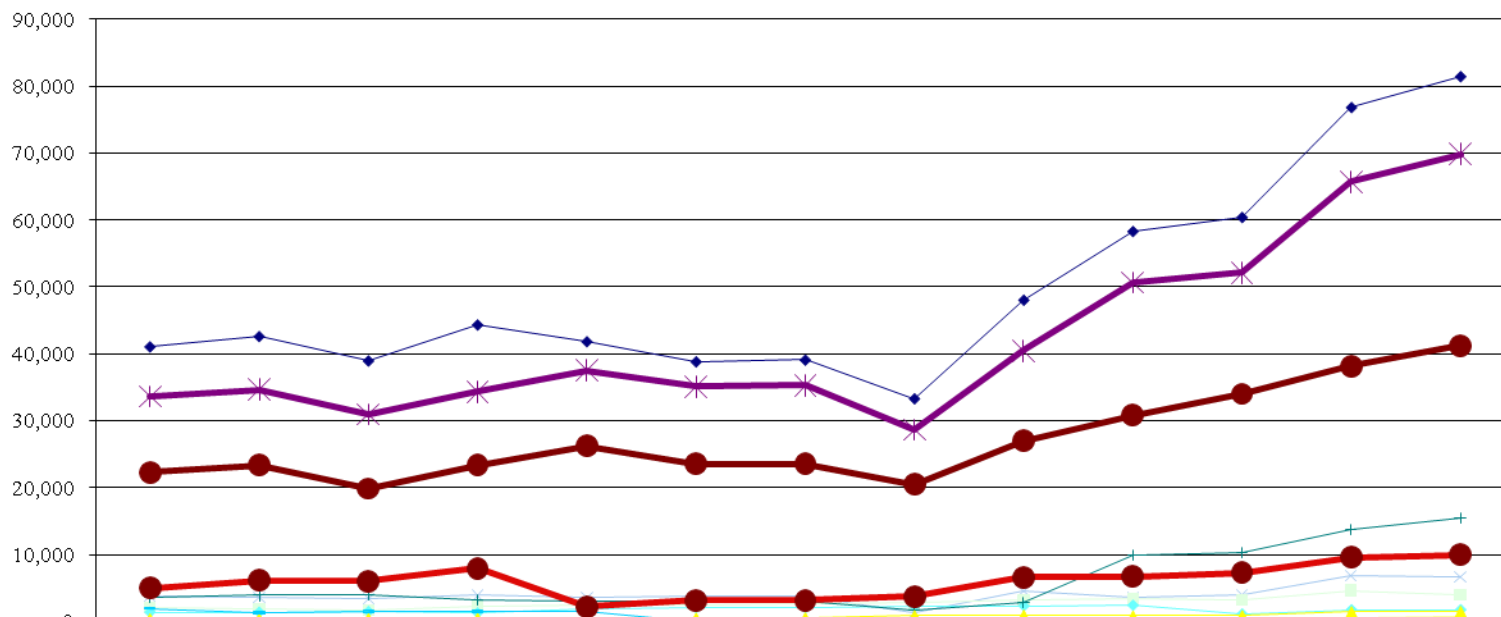
## Weak Capability for “Conventional War”

- Outdated armor and artillery. Weak conscript base.
- Land forces far better suited to defense in depth, popular warfare, and war of attrition than war of maneuver.
- Main surface Navy is vulnerable and obsolete in spite of upgrades..
- No truly modern combat aircraft; even best Soviet fighters are dated. Servicability and sustainability of fixed and rotary wing aircraft poor.
- Surface-to-air missile force obsolete except for small numbers short range TOR-M.
- C4I/IS&R/battle management systems and technology date and weak in spite of upgrades.
- Is developing significant military-industrial based, but years away from competitive level of production and technology.
- Some very tactical missiles and subsystems.
- Need massive transfers of advanced combat aircraft, surface-to-air missiles, and ATBM/ATCM to make major shift in balance.

## “Swarming” vs. “Attrition”

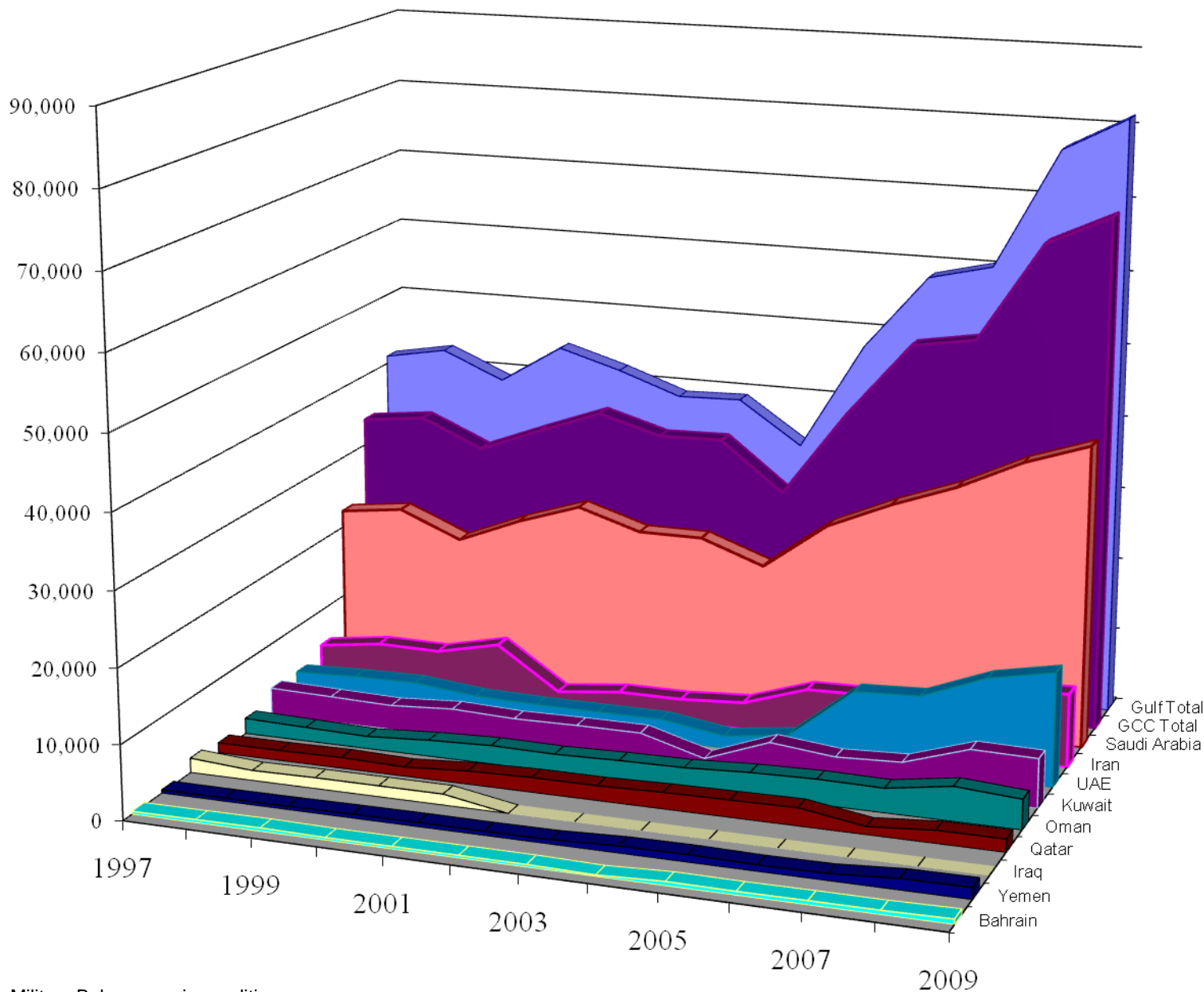
- Iran practices “swarming” targets in the Gulf with large numbers of small craft, shore-based anti-ship missiles, missile armed aircraft, and increasing support from UAVs/UCAVs.
- Tactics strongly favor surprise and/or sudden escalation to be successful.
- Also studies patterns of slow, episodic low-level attacks that intimidate, alter shipping patterns and insurance, threaten/attack offshore and coastal targets at levels sufficient to put on military pressure without provoking major conflict or retaliation.
- Exercises are a form of intimidation, as are shifts in deployments, weapons and technology tests and announcements.
- No fixed boundaries between “conventional” and asymmetric” warfare, or threats, low level military acts, and conflict.
- Can reinforce conventional threats/deterrence by use of proxies in other areas.

# Comparative Military Spending: 1997-2009

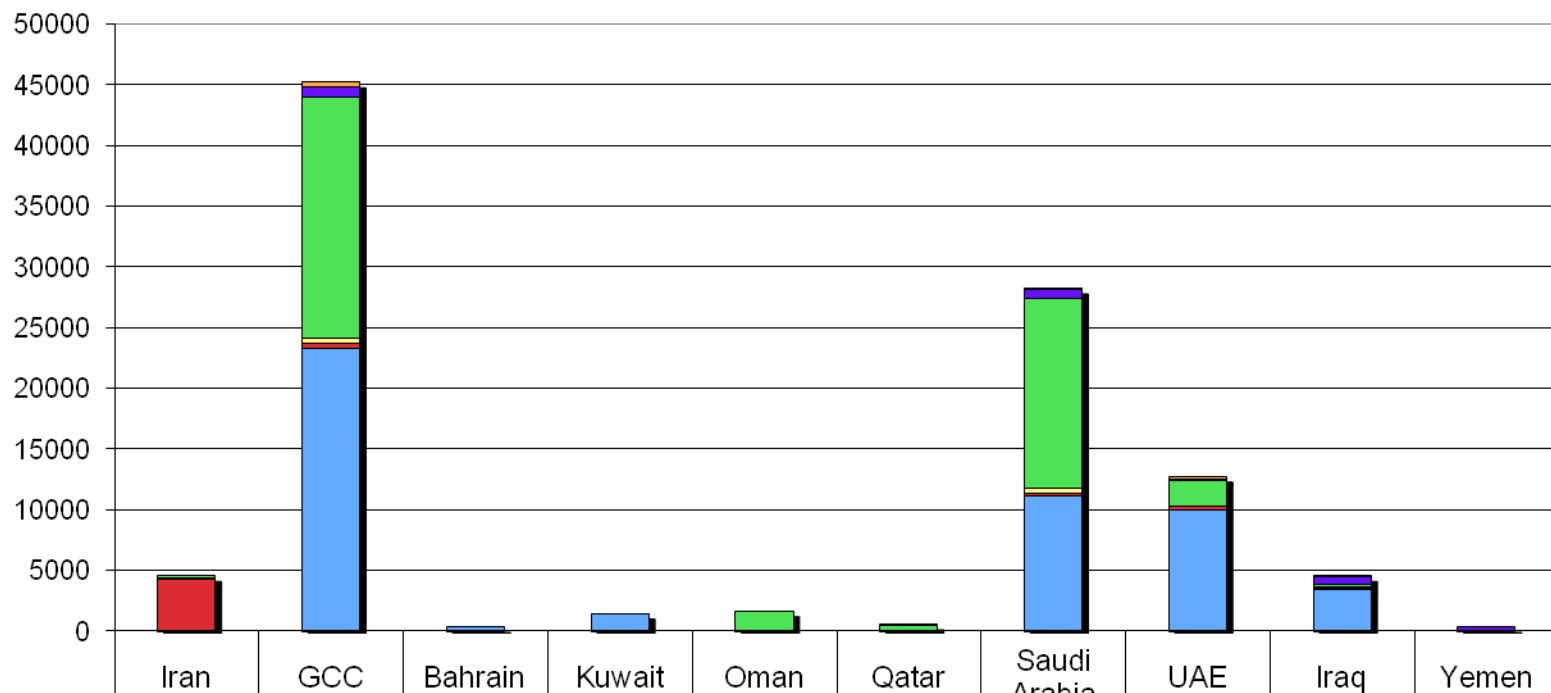


	1997	1998	1999	2000	2001	2002	2003	2004*	2005	2006	2007	2008	2009
—▲— Bahrain	387	427	472	342	355	352	350	191	559	498	550	552	697
—★— Kuwait	3,827	3,614	3,401	3,933	3,614	3,720	3,720	1,275	4,539	3,640	4,002	6,810	6,650
—■— Oman	2,126	1,913	1,701	2,232	2,551	2,445	2,657	2,764	3,210	3,410	3,298	4,657	4,060
—◆— Qatar	1,382	1,382	1,488	1,275	1,807	2,020	2,020	2,232	2,327	2,430	1,090	1,750	1,750
—+— UAE	3,614	3,933	4,039	3,189	2,976	2,976	2,976	1,701	2,817	9,888	10,292	13,730	15,470
—●— Saudi Arabia	22,323	23,386	19,878	23,386	26,256	23,599	23,599	20,515	27,000	30,810	34,020	38,200	41,200
—✱— GCC Total	33,659	34,655	30,979	34,357	37,559	35,112	35,322	28,678	40,452	50,676	52,142	65,699	69,827
—▲— Yemen	437	421	456	529	570	547	596	940	1,001	858	927	1,490	1,550
—◆— Iraq	1,982	1,382	1,488	1,488	1,488	0	0	0	0	0	0	0	0
—●— Iran	4,996	6,165	6,060	7,972	2,232	3,189	3,189	3,720	6,590	6,759	7,310	9,590	10,000
—◆— Gulf Total	41,074	42,623	38,983	44,346	41,849	38,848	39,107	33,338	48,043	58,290	60,379	76,779	81,377

# Comparative Military Spending: 1997-2008



# New Arms Orders by Supplier: 2005-2008



	Iran	GCC	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	Iraq	Yemen
■ Total	0	0	0	0	0	0	0	0	0	0
■ All Others	0	400	0	0	0	100	100	200	100	0
■ All Other European	0	900	0	0	0	0	800	100	600	200
■ Major West European	200	19,800	0	0	1,500	500	15,600	2,200	200	0
■ China	100	400	0	0	0	0	400	0	100	0
■ Russia	4,300	500	0	0	0	0	200	300	100	200
■ US	0	23,300	400	1,500	200	0	11,200	10,000	3,500	0

0 = Data less than \$50 million or nil. All data rounded to the nearest \$100 million.

Source: Richard F. Grimmett, Conventional Arms Transfers to the Developing Nations, Congressional Research Service, various editions.

# Russian Comments on China as Supplier - I

Russia: Iran Seeks Chinese Arms After Russian Refusal To Sell S-300  
CEP20100714677003 St. Petersburg Vlasti.net in Russian 12 Jul 10

...Iran now intends to immediately reorient itself towards China in purchasing the surface-to-air missile systems [ZRK] it needs. In addition, Iran itself is hastily developing its own counterpart to the ZRK.

...By all appearances, the inglorious history of Russia's refusal to supply Iran with S-300 surface-to-air missile systems, which has lasted for three years now, is far from over, although officially it was terminated in the course of the recent visit of RF President Dmitry Medvedev to the United States, when he promised Barack Obama that he would not send five battalions of S-300PMU-1 ZRK that had already been assembled at enterprises of NPO [Science and Production Association] Concern Almaz Antey, and paid for by Iran. According to various data, the contract, signed by Moscow and Teheran in 2007, was valued from \$800 million to \$1 billion, news.km reports.

As was learned from SMI reports, Iran now intends to immediately reorient itself towards China in purchasing the surface-to-air missile systems that it needs. In addition, Iran itself is also hastily developing its own counterpart ZRK, similar to the S-300, as was announced in Teheran in 2010 by Heshmatollah Kasiri, a member of the Iranian military command. According to his statements, the new system, developed by specialists of the Iranian VPK [military-industrial complex] will enter the armament of the national army very soon.

...Iran has already warned that in the event Russia fails to fulfill the S-300 contract in full, it will demand through the Court of Arbitration the return of the entire amount of the contract and the payment of penalty fines. According to various estimates, the total sum of Russia's losses on the S-300 contract may amount to roughly \$1.2 billion. If you recall that last year the entire export of Russian arms came to just \$8.5 billion, the upshot is that in its desire to do a service to the United States, Russia has thrown roughly 14% of its annual revenues from arms exports down the drain.

Iran also has begun to demonstrate to Russia that the latter may also suffer in other areas if, out of political considerations, it does not fulfill its foreign economic contract for the S-300. This spring Teheran announced that it was sending back to Russia all of our flight crews who for some time now have been flying Russian Tu-154 aircraft on internal Iranian routes. In addition, because of the recent delays in the delivery of the surface-to-air missiles, Iran also has halted talks on the purchase of a batch of 30 Tu-204 passenger planes, which have been conducted since 2007.

## Russian Comments on China as Supplier - II

In the opinion of military experts, Chinese "pirates," having assimilated our technologies, will now produce the J11 for subsequent sale to Third World countries. Generally, Russian experts expected this, knowing the "oriental subtleties" of the Chinese mentality, but estimated that the PRC would require at least ten years to develop the new production process, especially for the engine.

...But the Chinese moved faster than that. As quickly as the early 2000's, they had a modified J11 consisting of 70% local components. It was equipped with an improved Chinese radar, could carry Chinese-made missiles, and had also acquired the capability of attacking ground targets. Later they replaced nearly all of the analog instruments of the Russian Su-27 with their own onboard computer with several displays. And as early as 2007, China was showing the first prototypes of the J11B model--nearly a complete copy of the improved Su-27SMK.

The Chinese Army also has other models of arms that look like Russian ones. While collaborating with the Russian Fazotron-NIIR Corporation, the PRC purchased one or two fighter radars "for testing," and a few years later their Chinese clone appeared. A project 054A missile frigate under construction in Shanghai had a search radar installed similar to our Fregat-M2YeM radar, which Russia had previously delivered to China. The Chinese PLZ05 155mm self-propelled howitzer was copied from the Russian 2S19M1. The "Smerch" multiple rocket launcher system is produced in China without any license agreement under the name A-100.

...The PRC's aircraft builders have also managed to create a clone of the Russian Su-33 carrier-based fighter, calling it the J-15. An experimental model of the plane, the T10K, of Soviet vintage, was used as the basis for this. It somehow was left behind in the Ukraine after the breakup of the USSR and was sold by Kiev to China. These two aircraft allowed the Chinese engineers to resolve the problem of the folding wings for their own carrier-based fighters.

Typically, prior to this China had wanted to buy 50 Su-33 carrier-based fighters from Russia, but then decided to first buy two copies "to try them out." Clearly, this was done in order for them to study the design and the technical performance characteristics of the model in more detail. Russia declined to sell these two planes, fearing a technology leak and recalling the situation with the J-11. After this, the PRC bought the T10K in Kiev, and began to make its own aircraft, the Su-33 clone.

But the Su-33 is not just a plane, it is one of a few fourth-generation carrier fighters in the world, and has been in the armament of the RF Navy since 1991. It is intended for defense of ships from air attack, and has an aerial refueling system. Apart from its cannon, the Su-33 has the renowned Moskit antiship missile, which can crack open ships the size of an aircraft carrier on impact, and air-to-air missiles. The Su-33 is essentially a cluster of advanced technical concepts; it carries a sight that makes it possible to attack and



## Russian Comments on China as Supplier - III

destroy an enemy plane even in a mode of complete radio silence. Information for the pilot is displayed in a heads-up display, while the pilot himself has a helmet-mounted target-designation system. It locks onto targets with the missile homing heads when the pilot directs his helmet sight at them. It is said that the Su-33 greatly surpasses the P-14 and P-18 [sic], the chief carrier fighters of the United States.

And this miracle aircraft is now in the hands of Russia's Asian competitors. Apart from this, today the PRC has organized series production of J-10, J-11, and FC-1 fighters, which are clones of our Su-30, Su-27, and MiG-29 aircraft. There is information that the PRC intends to build and sell abroad at least 1,200 of these fighters at prices that are half or even one third of the Russian originals.

And the low costs of the Chinese planes will be explained not only by the low wages of the workers at Chinese aircraft plants, but also by the fact that the Chinese did not have to invest enormous sums and years of labor in R&D to develop them, to devise the technologies, test new aircraft, and put them in production. At the same time, China sells virtually to everyone, although for now it is focused basically on the countries that are less well off. These are primarily interested not in the quality of their combat equipment and its technological superiority, but in the prices. And China is virtually unconcerned about its image as a responsible supplier of combat equipment and arms. It sells weapons even to conflict zones in Africa and Asia.

## Russian Comments on China as Supplier - IV

...Who benefits from our surface-to-air missiles not going to Iran, where they would prevent foreign planes from bombing the country with impunity? Russia? No, for instead of making money, it will lose an amount comparable to what the Russian Ministry of Defense would spend to purchase new arms for the Army and Navy for a whole year. This money would also come in handy to the designers of weapons, especially surface-to-air missile weapons, since even VVS [Air Force] generals acknowledge that Russian anti-aircraft defense systems are stagnating, and that, in terms of the time of introduction of new technologies, lag behind a "virtual adversary" by 20-30 years. And Russian PVO [Air Defense] systems are incapable of repelling all threats from countries such as North Korea and Iran.

Nor is the rescinding of the S-300 contract advantageous to Iran. In this case its air space remains unprotected.

In fact, this is advantageous only to three countries--the United States, Israel, and China. The United States and Israel will gain the capability of inflicting strikes on Iran's nuclear plants with impunity, if the latter does not have time to quickly find an adequate substitute for our ZRK, and to protect its enterprises buried deep underground. A task force of several tens of US warships, headed by an aircraft carrier, has already been sent to the Persian Gulf. In the event of a conflict, it can be used against Iran in combination with Israeli aviation.

...China is most interested in Russia's loss of image as a reliable supplier in arms markets. In contrast to the United States, Russia, and Great Britain, the troika of world arms sellers, the PRC is not interested in the nuances of politics of the purchasing countries; it is ready to sell everything it has to anyone, for what the buyer is prepared to pay.

At the same time, the Chinese are already "breathing down the necks" of our VPK in the world arms market. In recent decades they have been purchasing in Russia, under the guise of "test batches," one or two samples of recent models of planes, tanks, artillery pieces, and missiles, have disassembled them down to their screws at their military plants, and then copied them with all possible care. As a result, they have almost everything, and can offer them in the market. Of course, sometimes they don't copy all that well: "results vary," as the saying goes.

For instance, in 1992, Russia began sending Su-27SK fighters to China, shipped them 76 of them, and in 1995, actually sold them the license to produce another 200 of the aircraft at Chinese aircraft plants. Since 1996 they have been assembled under the name J11 in Shenyang using Russian components. By 2003 Russia had delivered 95 sets for the future J11 fighters, but then China refused to sign the contract for the batch of the next 105 items, evidently believing that it had acquired all the technologies it needed. However, officially the Chinese explained the unilateral withdrawal from the agreement by citing the limited combat capabilities of the plane.

# **Iran's Uncertain Military Industrial Base - I**

- **Major investment in military industry, largely under Islamic Revolutionary Guards Corps**
- **Cost not reflected in military budget.**
- **Major investment in nuclear technology and long range Shahab 1/2/3, Ghadr, Sajjil ballistic missiles.**
- **Declared chemical weapons state in CWC, biological capability suspected**
- **Can produce wide range of small arms, explosives conventional munitions, and copies of light guided weapons; has developed advanced components for IED explosives and triggering.**
- **Most claims to build advanced guided weapons and military electronics grossly exaggerated, but real progress over last half decade.**
- **Major land weapons efforts include:**
  - **100+ Zulfiqar main battle tanks.**
  - **Towsan light tanks.**
  - **140-170 Boragh armored personnel carriers**
  - **Towed and some Carnation and Thunder self-propelled tube artillery.**
  - **Large family of rocket launchers, some with cluster munitions.**
  - **Saege and Toophan antitank guided missiles; Knout RPG.**
  - **Misaq MANPAT and Pantsyr mobile light SAM.**
  - **Mohajer and other UAVs, UCAV variant.**

# Iran's Uncertain Military Industrial Base - II

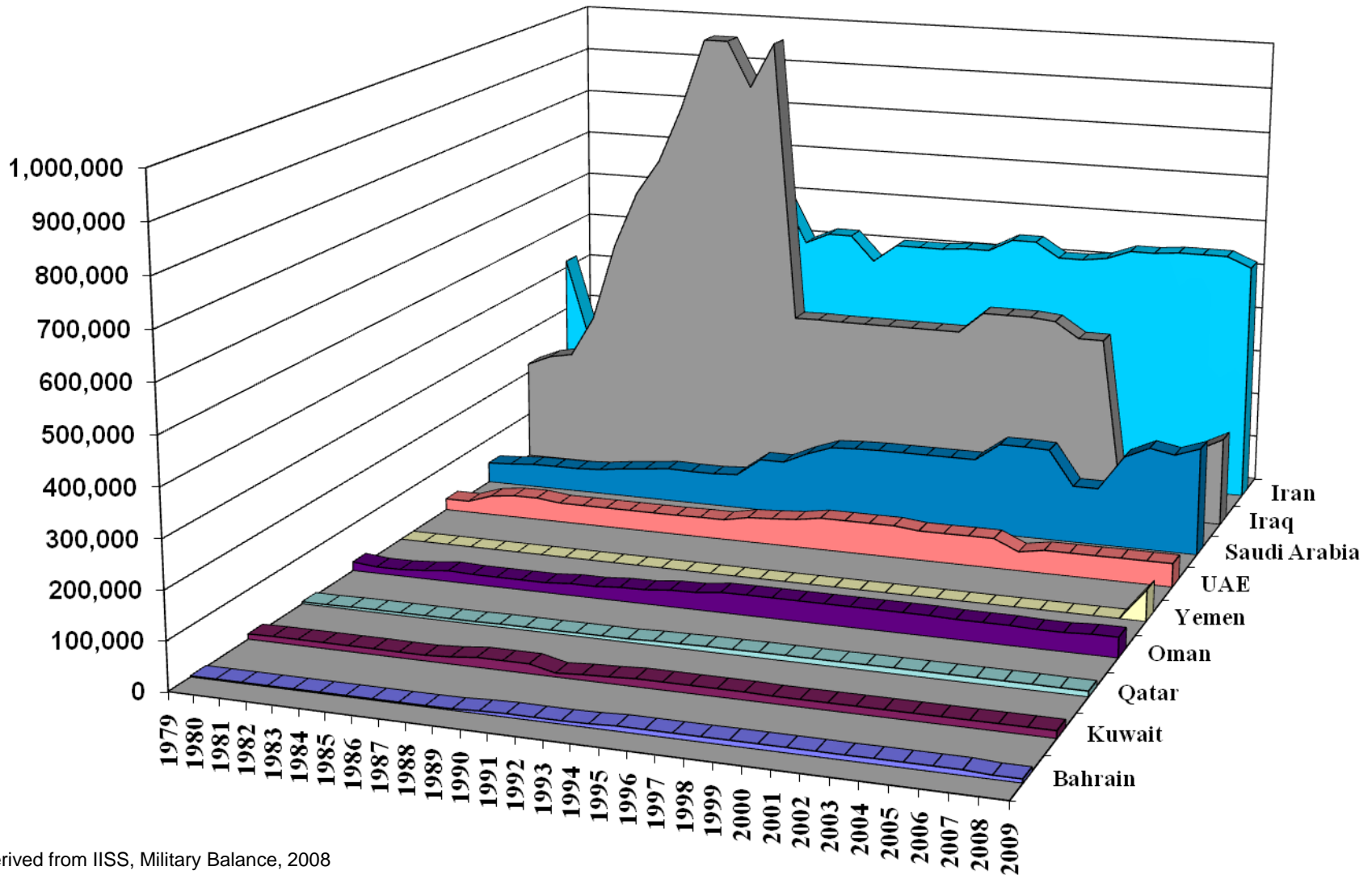
## •Major naval weapons efforts include:

- Mines, torpedoes, and variety of land, sea, and air-based anti-ship missiles.
- Launch Jamaran (Mowaj) destroyer; building a second.
- Yono and Nahang midget submarines and semi-submersibles.
- Peykaap-I coastal patrol boats, Peykaap-I missile patrol boats and small craft
- Saccade (CSS-N-8) and Kowar (C-701) SSM.
- Ship refits, upgrades to combat suites and weapons.
- UAVs and UCAVs.
- Air to ship missiles; upgrades to P-3s and naval ELINT aircraft

## •Major air weapons efforts include:

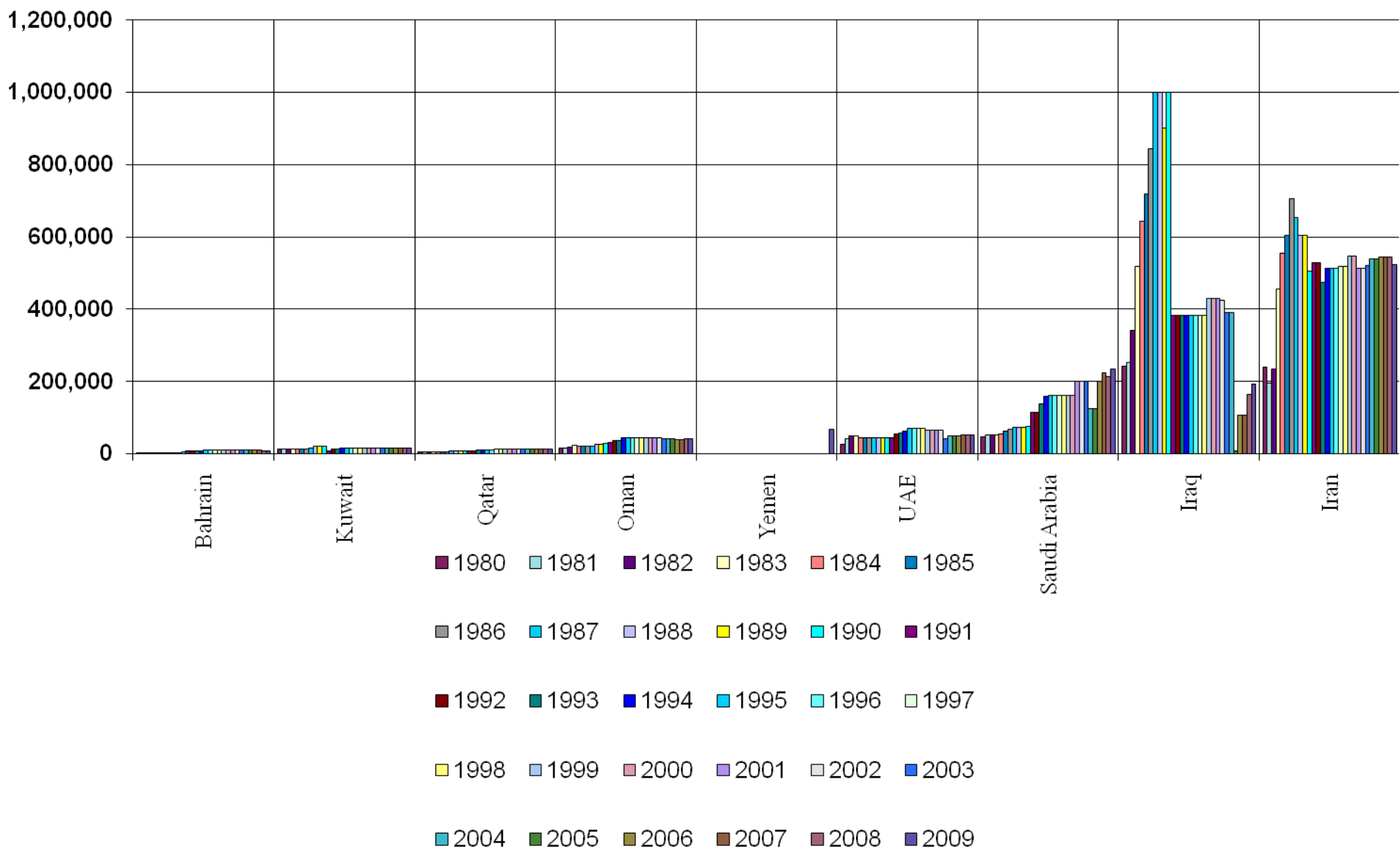
- Azarakhsh and Saegheh fighters.
- Shahbaviz helicopters.
- Hawk missile clone and AAM variant.
- Clones of Russian/PRC AAMs and ASMs
- Cluster bombs and warheads
- UAVs and UCAVs
- Cruise missile development
- Avionics upgrades, electronic warfare.
- Aircraft parts and upgrades.

# Comparative Military Manpower Trends



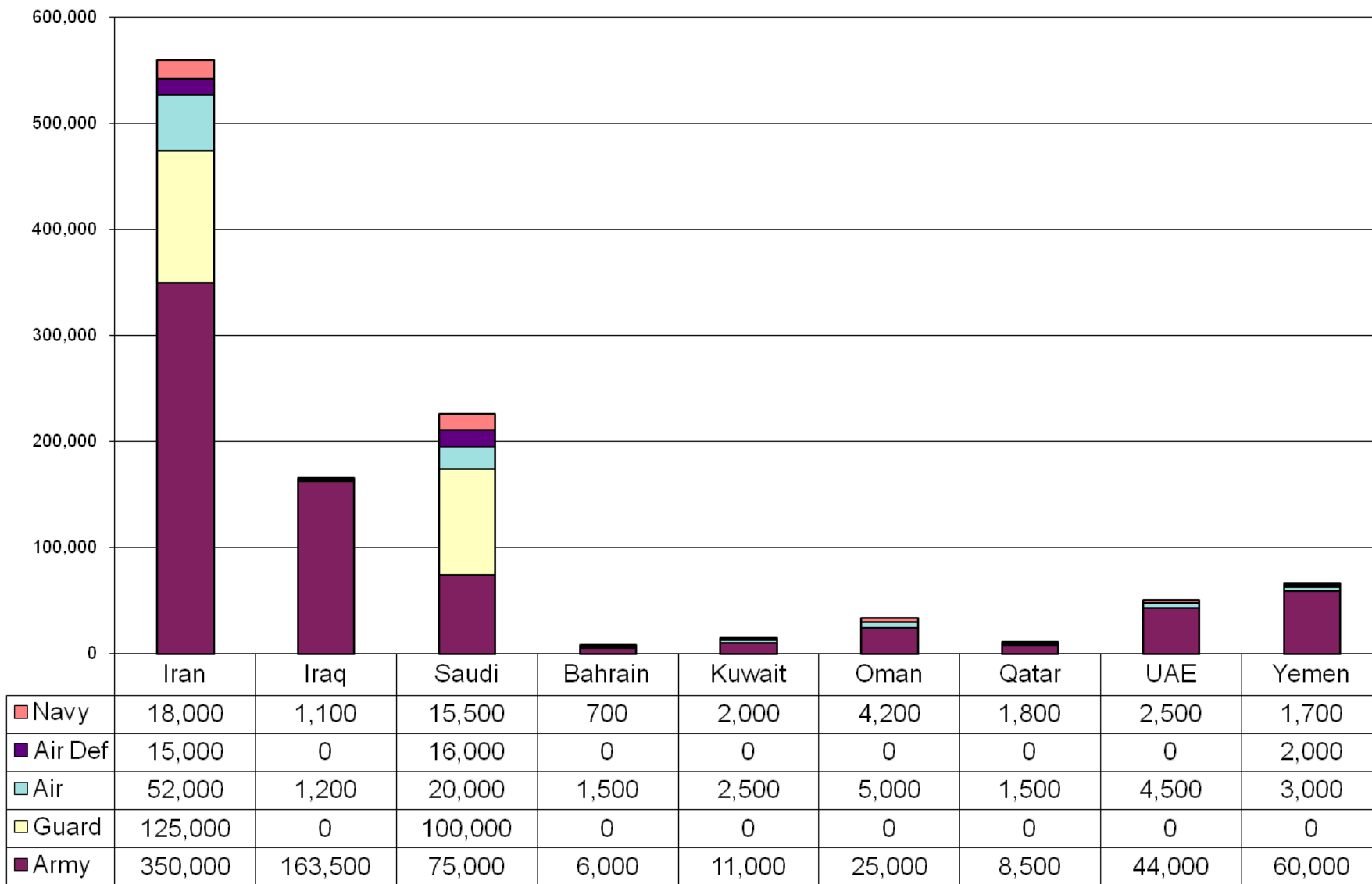
Derived from IISS, Military Balance, 2008

# Comparative Military Manpower Trends



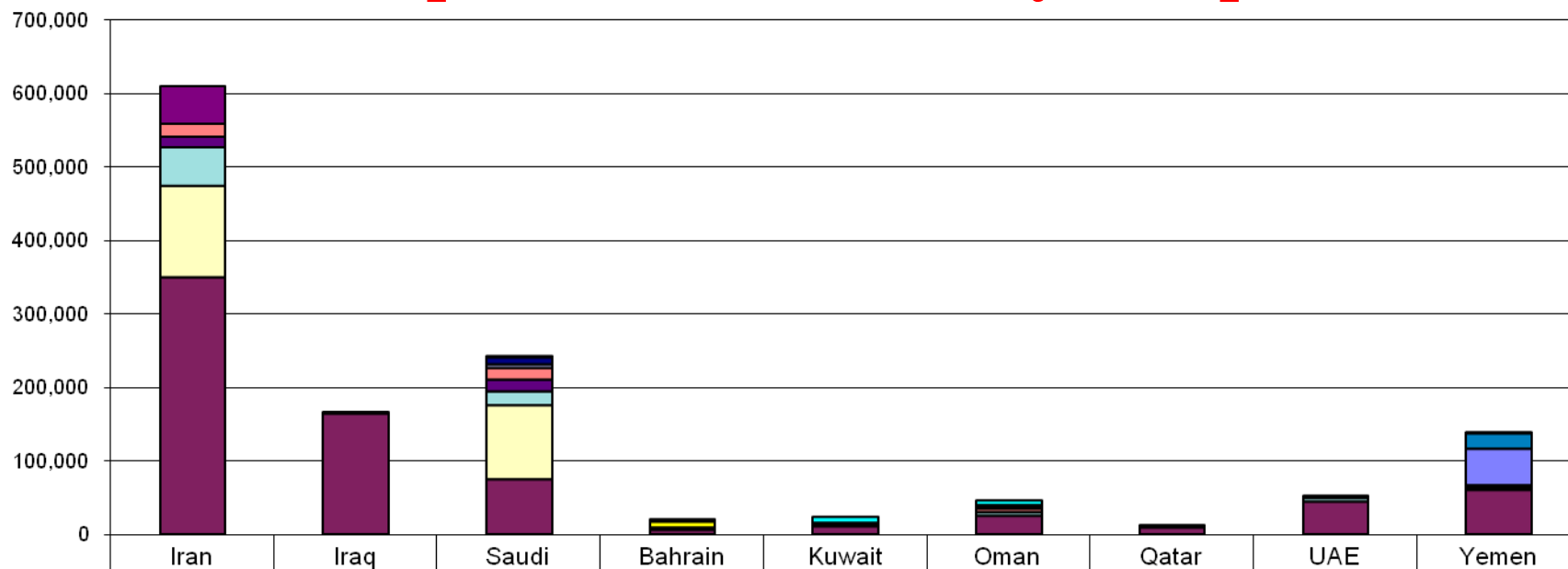
Derived from IISS, Military Balance, 2008

# Comparative Military Manpower: 2010



Derived from IISS, Military Balance, 2010

# Comparative Paramilitary Manpower: 2010



	Iran	Iraq	Saudi	Bahrain	Kuwait	Oman	Qatar	UAE	Yemen
Basij	0								
Other	50,000								
Guard				2,000	6,600	6,400			
Police				9,000					
Special Security			500						
Border Guard			10,500						
Coastguard			4,500	260	500	400		800	1,200
Tribal Levies						4,000			20,000
MOI Forces									50,000
Navy	18,000	1,100	15,500	700	2,000	4,200	1,800	2,500	1,700
Air Def	15,000	0	16,000	0	0	0	0	0	2,000
Air	52,000	1,200	20,000	1,500	2,500	5,000	1,500	4,500	3,000
Guard	125,000	0	100,000	0	0	0	0	0	0
Army	350,000	163,500	75,000	6,000	11,000	25,000	8,500	44,000	60,000



## Land Force Threats

- **Iranian Threat to Kuwait and Iraq**
- **Iranian permissive amphibious/ferry operation.**
- **Iranian dominance of Iraq; Invited In to Replace US?**
- **Spillover of Iraqi Sunni-Shi'ite power struggles.**
- **Yemeni incursion into Saudi Arabia or Oman**

### *But:*

- *Low near-term probability.*
- *High risk of US and allied intervention.*
- *Limited threat power projection and sustainability.*
- *Unclear strategic goal.*

## Iranian Land Forces

- **500,000-525,000 in its military forces, including Revolutionary Guards. Most are poorly trained conscripts.**
- **350,000 poorly trained reserves, and some 40,000 men in iparamilitary forces. In theory, it can mobilize up to 1,000,000 more young men (3,500 battalions) in its Basij Resistance Force In practice only a fraction of that force receives meaningful training, although has created a substantial local mobilization capability.**
- **Land forces include some 350,000 men in army and 100,000 in the land elements of the IRGC.**
- **No equivalent to best modern main battle tanks and armored infantry fighting vehicles**
- **Core of its 1,600+ tank force consists of the Zulfiqars and some 480 aging exports models of the T-72.**
- **3,200 major artillery weapons, but 2,010+ of tube artillery weapons are towed systems Most of its roughly 900 multiple rocket launchers are area fire weapons with limited operational effectiveness.**
- **Many of its Army aircraft, attack helicopters and other helicopters not operational or cannot be sustained for more than limited periods.**
- **Considerable capability to provide defense in depth of Iranian territory, and trains Army, land elements of the IRGC, and local Basij for this mission. Not organized or trained for power projection or sustained maneuver and combat outside Iran.**
- **Have the basing and capability to operate in the border areas of Iraq if Iraq does not have the support of the US.**

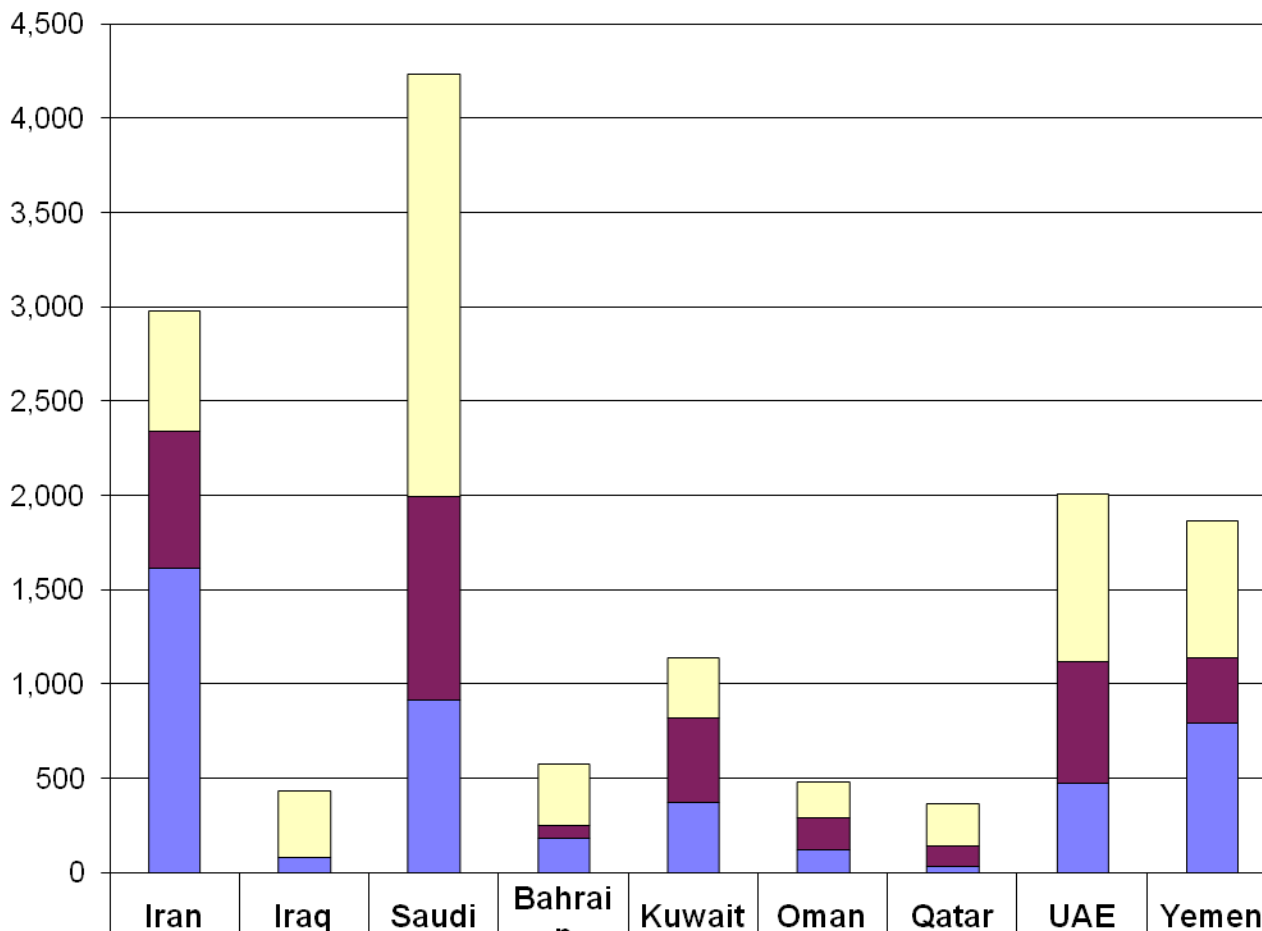
## Iranian Army Updates

- **June 21, 2010**
  - **Commander of the Iranian Army Ground Force Brigadier General Ahmad Reza Pourdastan stated “After years of continued sanctions, we are now in possession of good capabilities in the field of military industries and we are now equipped with the most advanced modern arms of the world through independence, self-sufficiency and reliance on the expertise of local experts”**
- **July 14, 2010**
  - **According to Iranian reporting, Ahmadinejad stated that the “country’s Army and IRGC enjoy high capabilities and power and can repel any possible aggression against Iran”**
  - **Pourdastan said that his units “have assessed [armed field tactics] in different wargames and have gained good experiences in this regard**
  - **These exercises are said to take place from October 23 – November 21**
  - **He further stated that sensors, remote controlled systems that are highly resistant to electronic jamming systems will be used**
  - **The ground forces also reportedly exercised highly advanced and modern tactics and successfully deployed troops in specified positions and strongholds to deter enemy advancement and counterattacks**

## Iranian Army Updates - II

- **August 3, 2010**
  - **Iranian media reporting has stated that the Iranian Army has started to use “home-made” Cobra Simulators**
  - **Iranian Army Airborne Commander General Kiomarth Ahadi stated that “these Iran-made simulators...will lower devaluation, human and financial losses and training costs while increasing pilots' experience.”**
  - **He further stated that, “All airborne bases have been equipped with flight training simulator systems”.**
  - **Further media reporting states that General Vahidi has announced the readiness of Iran’s “counter-strike plan” to repel any possible military attacks on Iran.**
  - **According to the General, “Tehran has already defined the necessary strategies and drawn defensive plans to confront enemy invasions”**
- **August 7, 2010**
  - **According to Iranian media reporting, Commander of the Iranian Army Ground Force Brigadier General Ahmad Reza Pourdastan announced on Saturday that the country plans to display a number of its most advanced military equipment systems on September 22.**

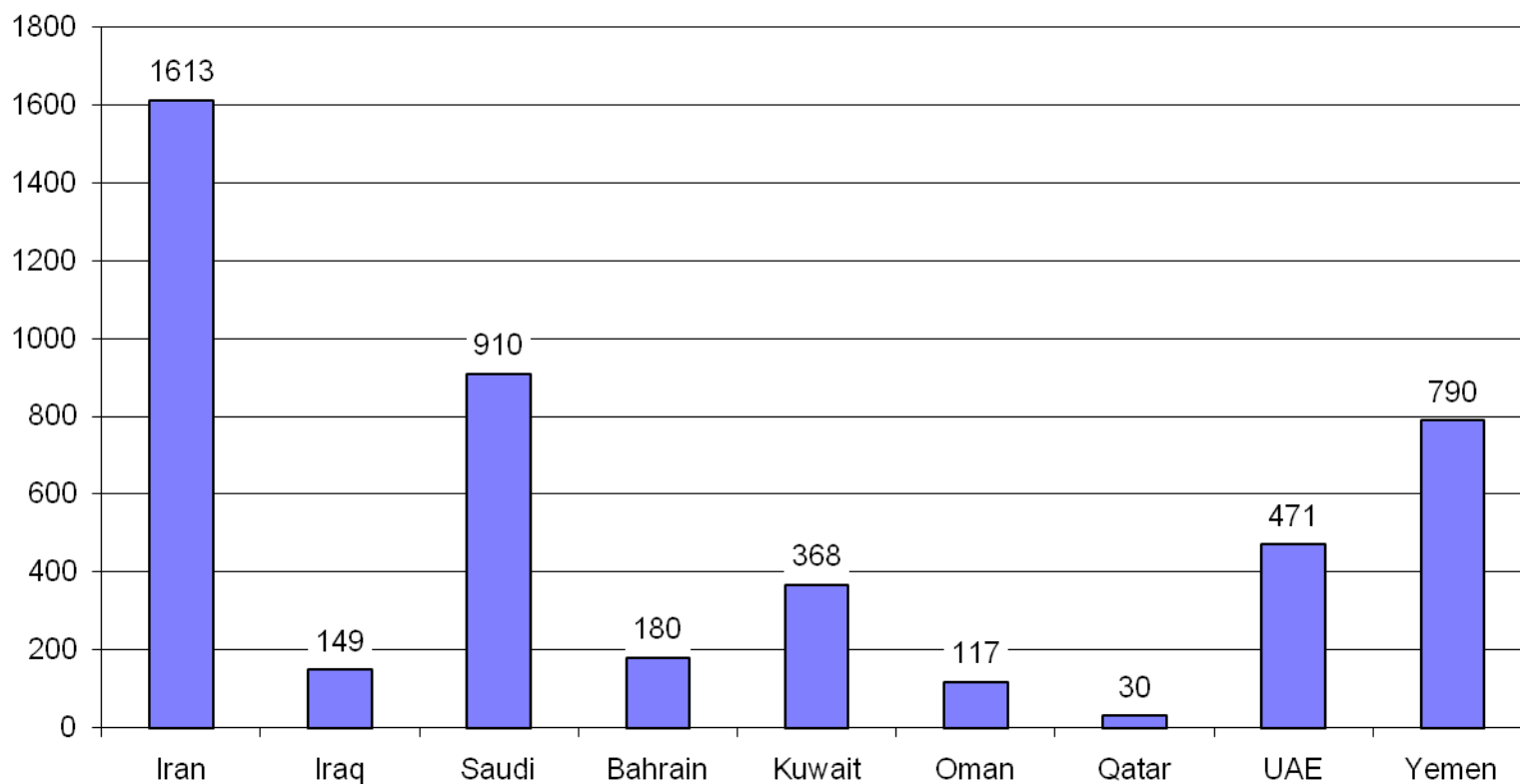
## Comparative Armored Vehicle Strength in 2010



	Iran	Iraq	Saudi	Bahrain	Kuwait	Oman	Qatar	UAE	Yemen
APCs	640	352	2,240	325	321	190	226	892	728
AIFV/Recce/Lt. Tanks	725		1,080	71	450	174	108	645	345
Main Battle Tanks	1,613	77	910	180	368	117	30	471	790

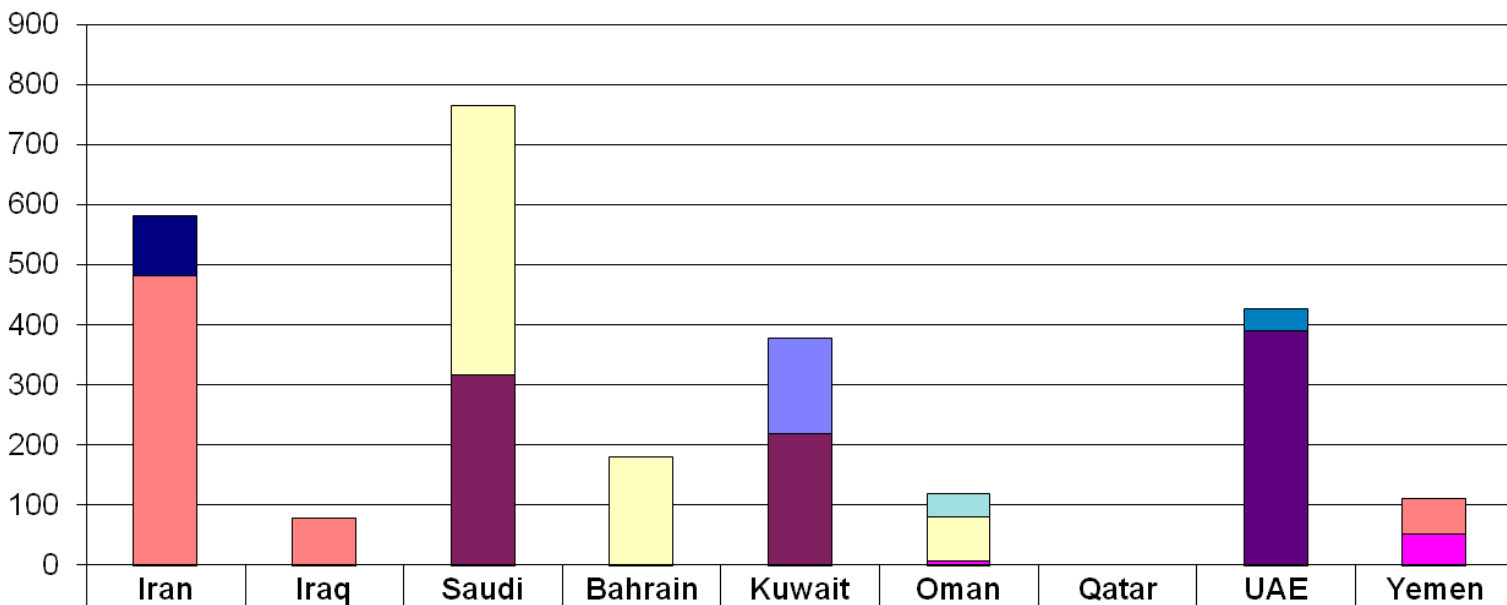
Source: Estimated by Anthony H. Cordesman using data from various editions of the IISS *The Military Balance* and Jane's *Sentinel*.

# Comparative Main Battle Tank Inventory, Regardless of Age or Quality



Derived from IISS, Military Balance, various editions and Jane's

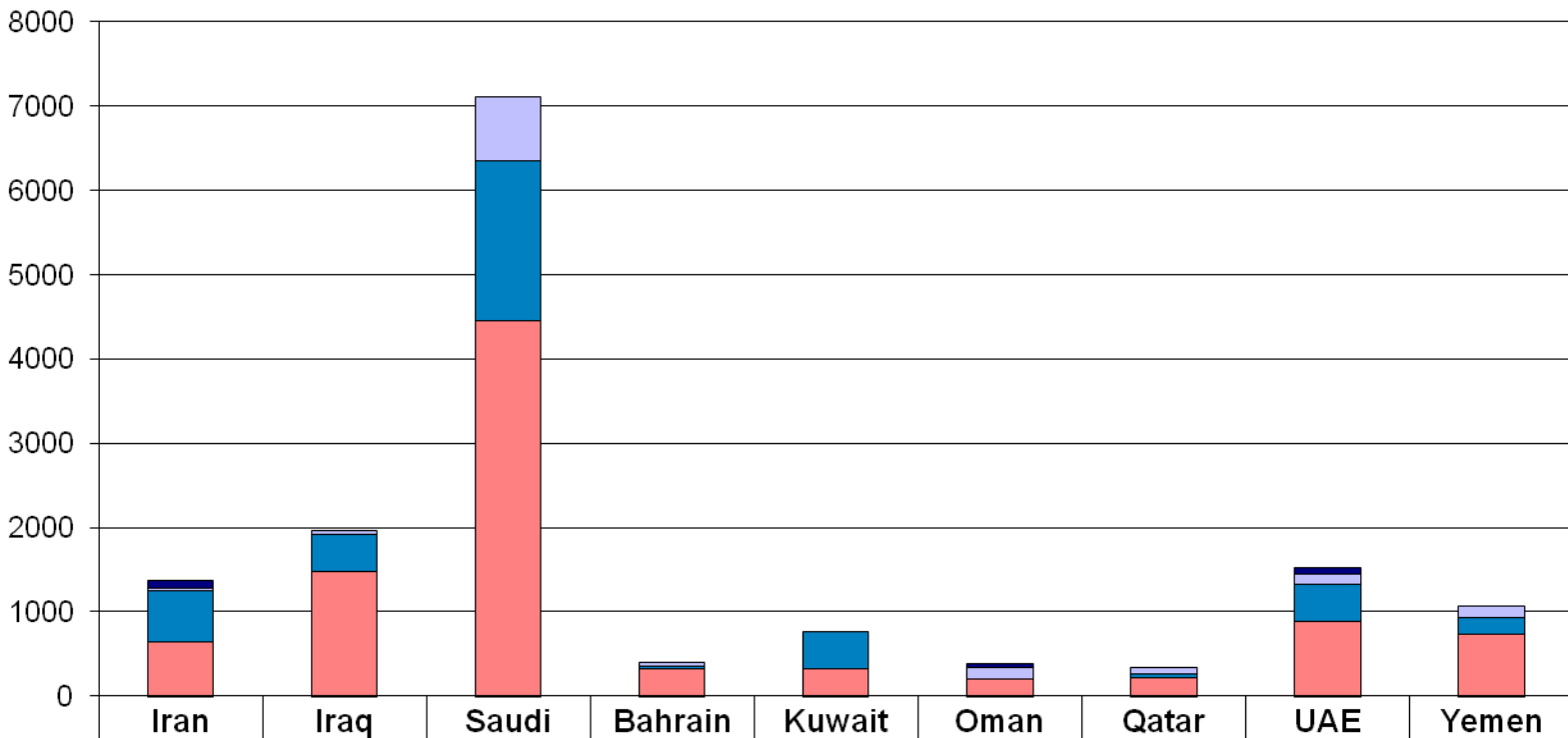
# Comparative Modern Tank Strength, 2010



	Iran	Iraq	Saudi	Bahrain	Kuwait	Oman	Qatar	UAE	Yemen
Zulfiqar	100								
OF-40								36	
T-72	480	77							60
M-84					159				
Leclerc								390	
Challenger 2						38			
M-60A3			450	180		73			
M-60A1						6			50
M-1A2			315		218				

Source: Estimated by Anthony H. Cordesman using data from the IISS, The Military Balance, various editions.

# Comparative Other Armored Vehicles Strength in 2010

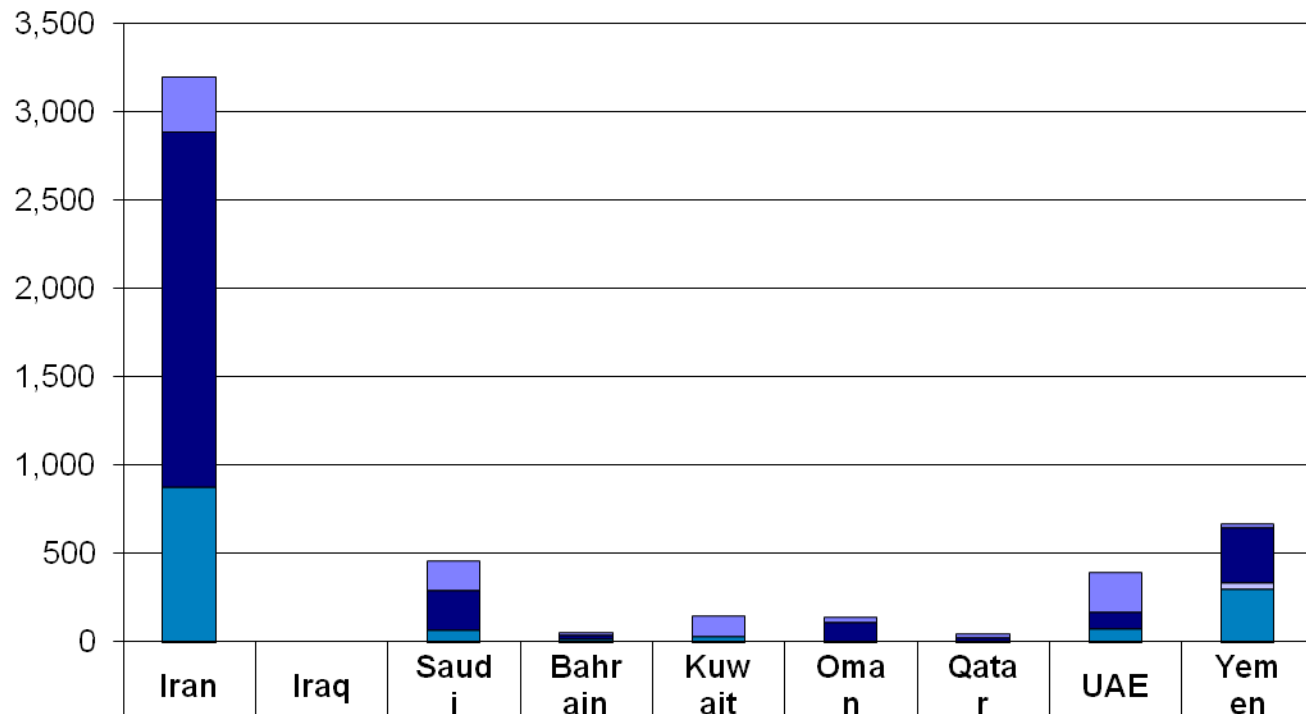


	Iran	Iraq	Saudi	Bahrain	Kuwait	Oman	Qatar	UAE	Yemen
■ Light Tank	80					37		76	
■ Recce	35	53	750	46		137	68	129	145
■ AIFV/AFV	610	434	1,897	25	450		40	430	200
■ APC	640	1,479	4,460	325	321	206	226	892	728

Derived from IISS, Military Balance, and Jane's



# Comparative Artillery Strength in 2010



	Iran	Iraq	Saudi	Bahrain	Kuwait	Oman	Qatar	UAE	Yemen
■ Self-Propelled Tube	310		170	13	113	24	28	221	25
■ Towed Tube	2,010		225	26	0	108	12	93	310
■ Assault and Coastal	0		0	0	0	0	0	0	36
■ Multiple Rocket Launcher	876		60	9	27		4	72	294
■ Mortar	0	0	0		0	0	0	0	0

Derived from IISS, Military Balance, and Jane's

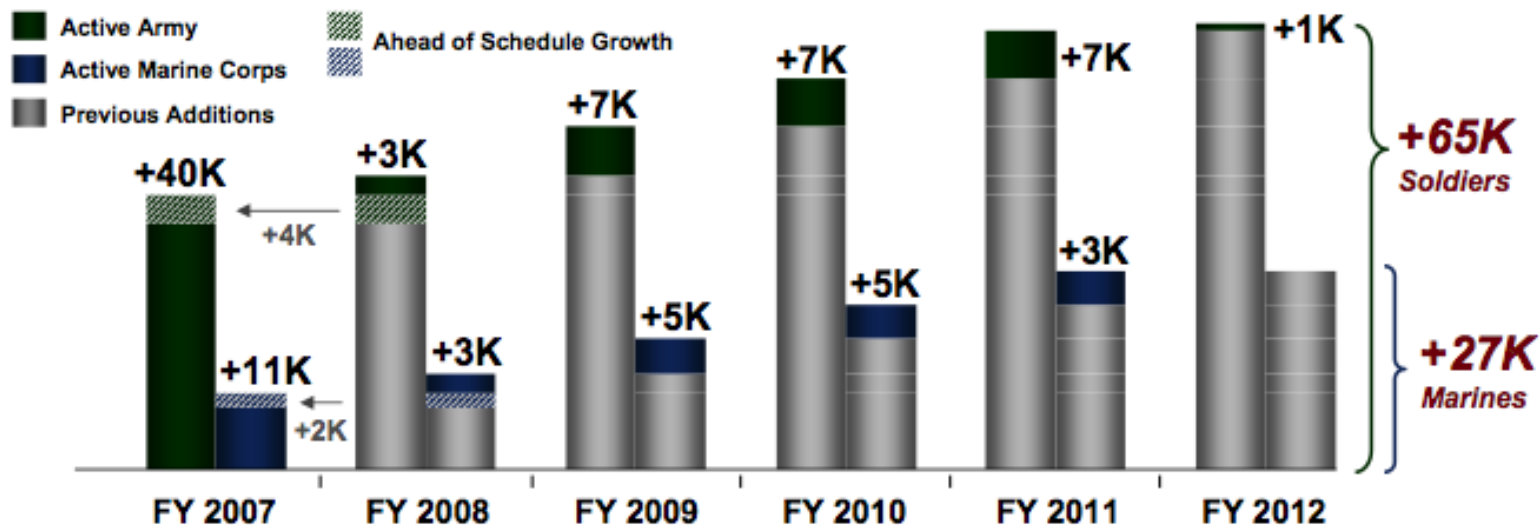
# Keeping a Decisive US Qualitative Edge in US Forces and Arms Transfers to the Gulf (\$10.5B in FY087 & FY09)

Joint Ground Capabilities	Joint Maritime Capabilities	Joint Air Capabilities	Space-based Capabilities
<ul style="list-style-type: none"> <li>– Future Combat Systems:                             <ul style="list-style-type: none"> <li>• Ground and air systems</li> </ul> </li> <li>– 119 Stryker Vehicles</li> <li>– 5,249 High Mobility Multi-purpose Wheeled Vehicles</li> <li>– 1,061 Heavy Tactical Vehicles</li> <li>– 3,187 Medium Tactical Vehicles</li> <li>– 29 M1A1 Abrams Tank Upgrades</li> <li>– Chemical Weapons Demilitarization</li> </ul>	<ul style="list-style-type: none"> <li>– CVN 21 Carrier Replacement</li> <li>– 1 Virginia Class Submarine</li> <li>– 1 DDG-1000 Destroyer</li> <li>– 2 Littoral Combat Ships</li> <li>– 2 T-AKE Auxiliary Dry Cargo Ships</li> <li>– CVN Refueling Complex Overhaul</li> <li>– 2 Joint High Speed Vessels</li> </ul>	<ul style="list-style-type: none"> <li>– 16 F-35 Joint Strike Fighters</li> <li>– 20 F-22A Raptors</li> <li>– 36 V-22 Ospreys</li> <li>– 23 F/A-18 Hornets</li> <li>– 22 E/A-18G Growlers</li> <li>– 16 CH-47 Chinooks</li> <li>– VH-71 Helicopter</li> <li>– KC-X Aerial Refueling Tanker</li> <li>– 59 Predators, Reapers and Warriors</li> </ul>	<ul style="list-style-type: none"> <li>– 2 Space Based Infrared Systems</li> <li>– 4 Expendable Launch Vehicles</li> <li>– GPS Satellite</li> <li>– 1 Mobile User Objective System</li> <li>– Transformational Satellite</li> <li>– Advanced Extremely High Frequency Satellite</li> <li>– Wideband Global SATCOM</li> <li>– Ballistic Missile Defense</li> </ul>
<p><b>Basic Research +\$0.3B in FY 2009 (+\$1.4B FY09-FY13)</b></p>			

# Increase Ground Capabilities

**+\$8.7B**  
FY08 - FY09

<b>Army</b> Active	<b>42</b>	Brigade Combat Teams (482.4K Soldiers)	➔	<b>48</b>	Brigade Combat Teams (547.4K Soldiers)
	<b>12/12</b>	Months Home Station / Months Deployed		<b>24/12</b>	Months Home Station / Months Deployed
<b>Marine Corps</b> Active	<b>2.5</b>	Marine Expeditionary Forces (175K Marines)	➔	<b>3</b>	Marine Expeditionary Forces (202K Marines)
	<b>7/7</b>	Months Home Station / Months Deployed		<b>14/7</b>	Months Home Station / Months Deployed



Source: FY 2009 DoD Budget Request; FY 2008 Budget; FY 2007 Supplemental

Numbers may not add due to rounding

## Air/Missile Threats

- **Precision air strikes on critical facilities: Raid or mass attack.**
- **Terror missile strikes on area targets; some chance of smart, more accurate kills.**
- **Variation on 1987-1988 “Tanker War”**
- **Raids on offshore and critical shore facilities.**
- **Strikes again tankers or naval targets.**
- **Attacks on US-allied facilities**
- **Use of UAVs as possible delivery systems (conventional or Unconventional munitions)**

### *But:*

- *Low near-term probability.*
- *High risk of US and allied intervention.*
- *Limited threat power projection and sustainability.*
- *Unclear strategic goal.*

## Iranian Air Forces

- **Manpower strength of some 25,000-35,000.**
- **Inventory strength of some 312 combat aircraft**
- **40-60% of these aircraft have limited or no mission capability , and many so old or poorly supported that they cannot sustain a high sortie rate.**
- **Dependent on a large number of aircraft purchased during the time of the Shah – 44 F-14s, 20 F-5Bs, 64 F-4Ds and F-4Es, and 60+ F-5E/Fs – which total some 60% of its total inventory and have had only limited, local modernization over more than three decades.**
- **Other major combat aircraft include 30 Su-24MK, 35 MiG-29, 13 Su-25K Russian fighters, 10 F-1E French Mirages and 24 Chinese F-7Ms. Include Iraqi fighters flown to Iran during the Gulf War.Su-24s and MiG-29s are early export versions with less capable avionics.**
- **Modified and updated some aircraft, acquired relatively modern Russian air-to-air and surface-to-air missiles, has Chinese anti-ship missiles, and tried to equip its F-14s with modified I-Hawk missiles for long range air-to-air combat to make up for inability to operate the Phoenix.**
- **Producing its own unmanned aerial vehicles, is seeking to produce its own light Saegheh and Azarakhsh fighters,**
- **Report after report that Iran was buying large numbers of modern Russian and/or Chinese fighters none of which have ever been confirmed. Purchases now sharply restricted by UN sanctions.**

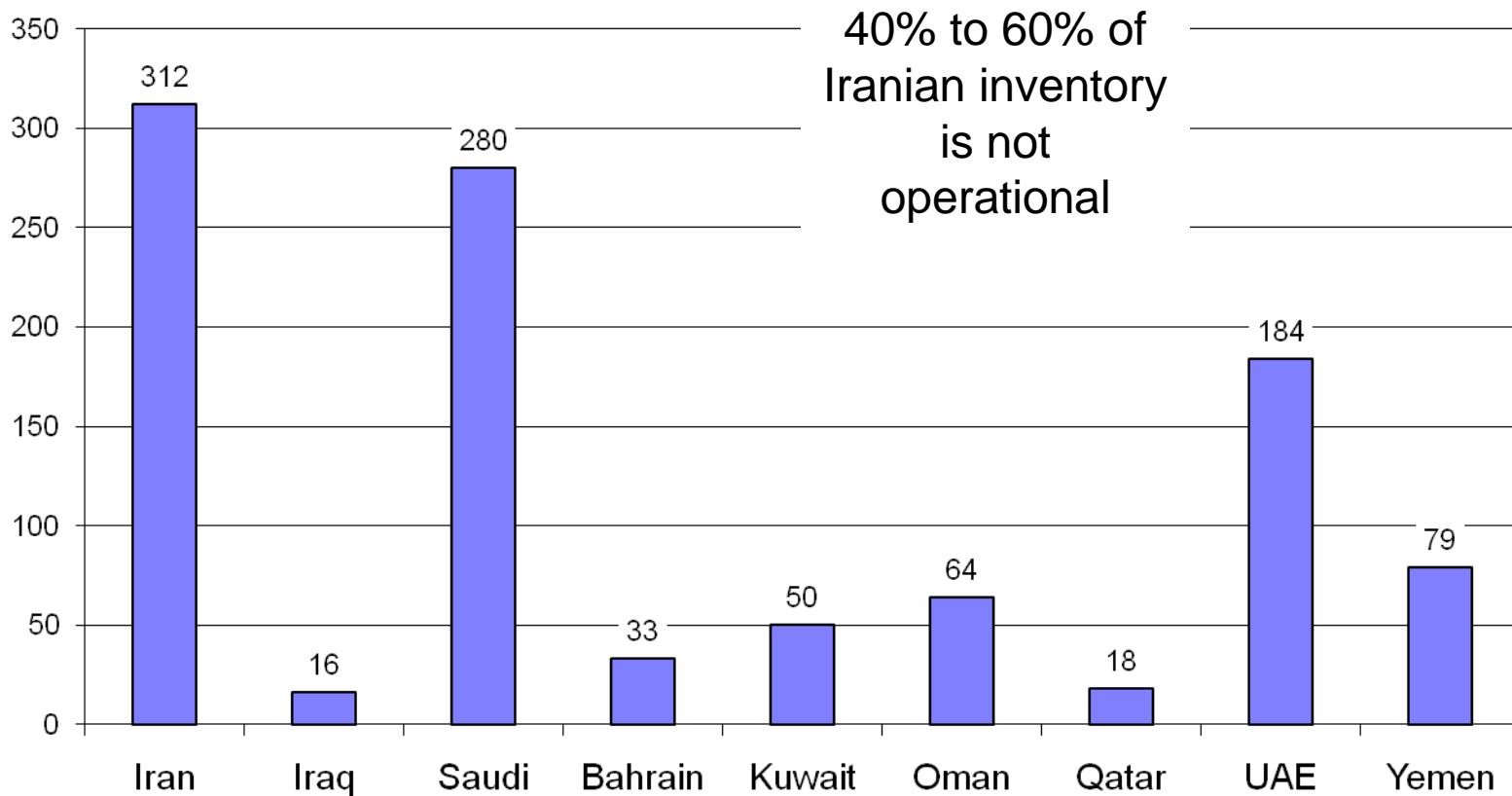
## Iranian Air Force Updates

- **July 4, 2010**
  - **Iranian Air Force seeks to deploy UAVs along its border**
  - **According to Iranian reporting, Deputy Lieutenant Commander of Army's Air Force for Operations General Majid Pirhadi stated “We are seeking to equip all the country's central (air) bases with long-range UAVs but for now equipping bases along borders sets a priority”**
  - **Pirhadi added, “that all border bases in western and southern Iran will be equipped with UAVs by the end of summer (September 2010)...These drones are currently tasked with intelligence and information gathering and reconnaissance missions and that the Iranian Army plans to use different types of drones for combat, reconnaissance, disruption and communication missions”**
  - **Further reports claim Iran has inaugurated the production line of two home-made Unmanned Aerial Vehicles (UAVs) with bombing and reconnaissance capabilities.**
    - The two hi-tech drones named 'Ra'd' (Thunder) and 'Nazir' (Harbinger) are capable of conducting long-range reconnaissance, patrolling, assault and bombing missions with high precision.
    - Ra'd which is a UAV of choice for assault and bombing missions has the capability to destroy the specified targets with high pinpoint precision
  - **FNA states, “Iran successfully tested a home-made radar-evading UAV with bombing capabilities last June. Also in 2008, the country's Defense Industries launched production lines of two well-known home-made fighter jets, namely Saeqeh (Thunderbolt) and Azarakhsh (Lightening).”**

## Iranian Air Force Updates - II

- **August 2, 2010**
  - **General Amir Hossein Chitforoush announced that Iran plans to mount new radar systems on multiple fighter jets throughout its air force bases.**
  - **According to the General, all fighter jets have been equipped with this state of the art system which will help with night activities.**
  - **Commander of Khatam ol-Anbia Air Defense Base Brigadier General Ahmad Miqani said “We have the honor to announce that we have reached full self-sufficiency in the production of different types of the needed radars with different ranges and frequency bands”**
  - **Additionally, Iranian Defense Minister Brigadier General Ahmad Vahidi stated that the country's radar systems are capable of detecting every target in the air.**
  - **"Today, we own sea-based and ground-based radars as well as radars which are capable of identifying multiple air targets in various frequencies and at different altitudes.”**
- **August 5, 2010**
  - **Iranian media reporting states that the Iranian Fighter Jets practiced loading and staging their air weapons systems during a week long military exercise/show.**
  - **The fighter jets included the F-4, F-5, F-7 and the Sukhoi SU-24**
  - **Iran says it is carrying out the four-stage military maneuvers in order to test state-of-the-art weaponry, the latest aerial combat tactics and different engagement techniques**

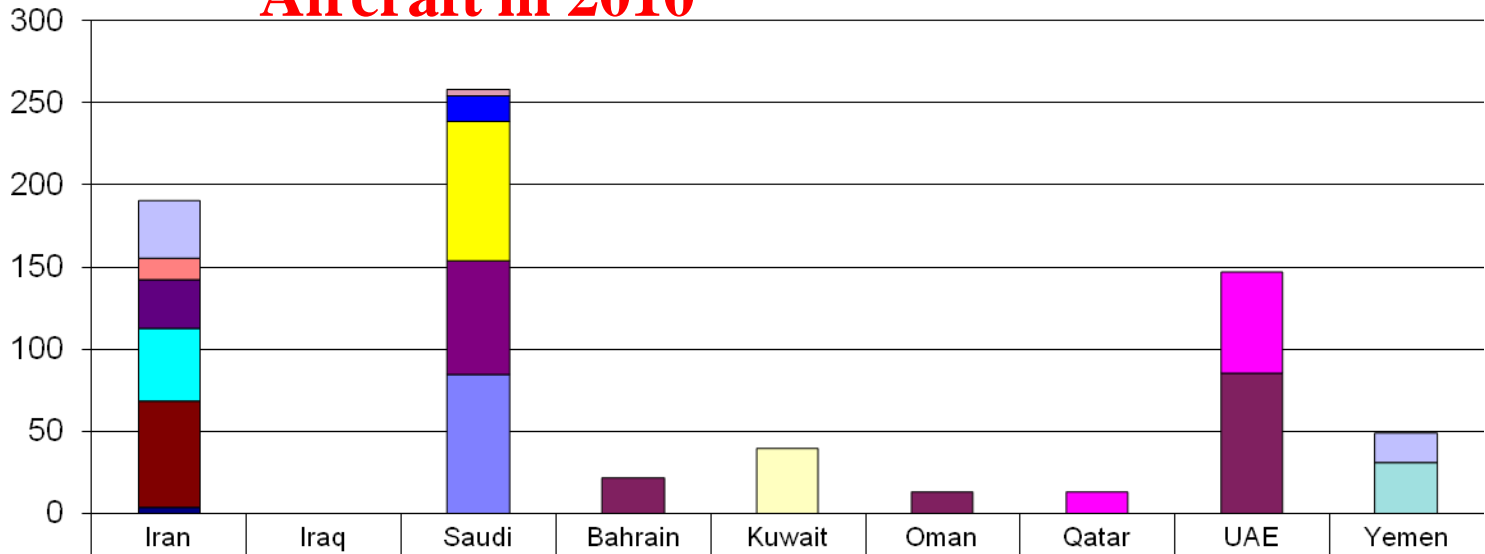
# Comparative Combat Air Strength in 2010



Derived from IISS, Military Balance, and Jane's



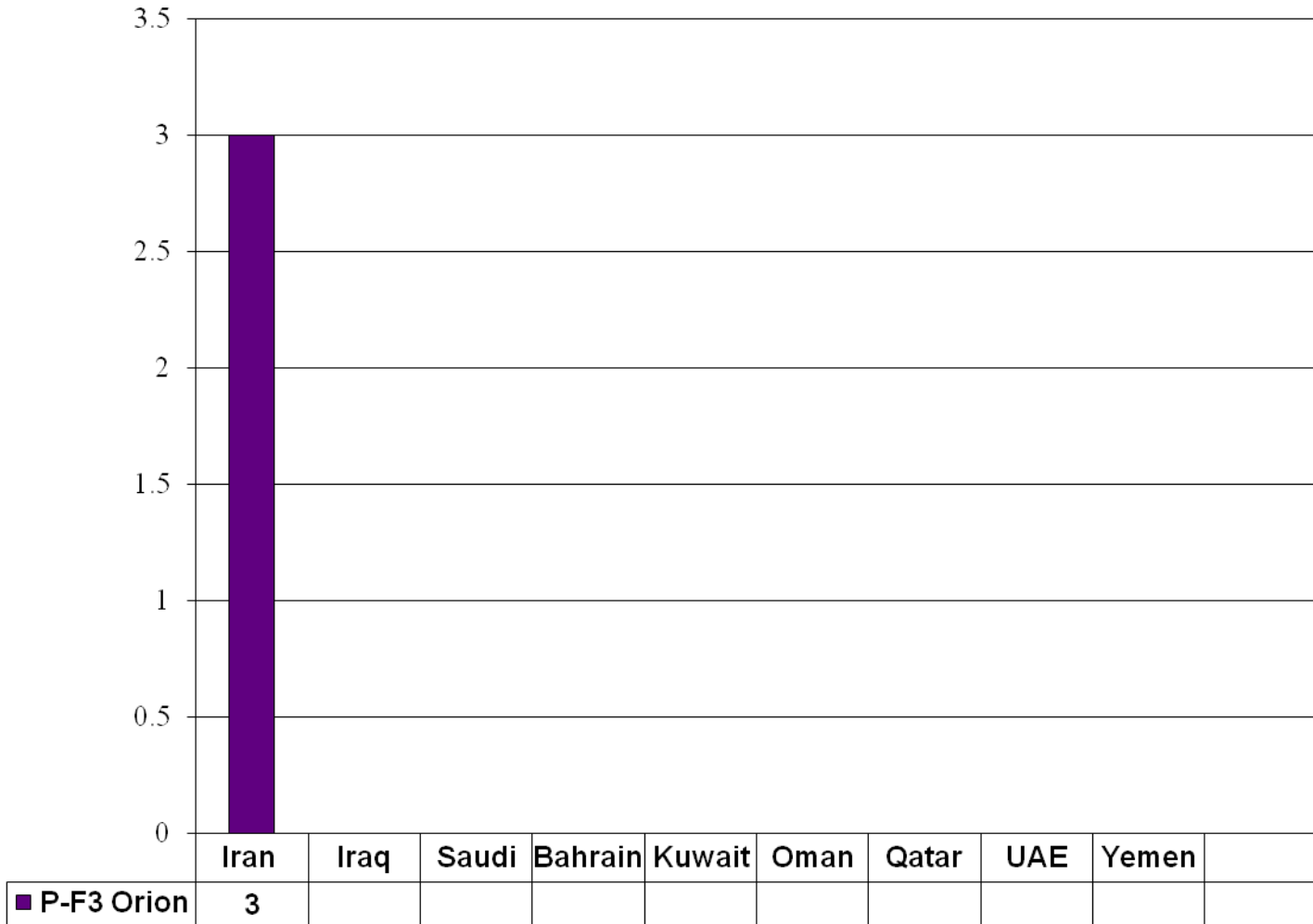
# Comparative High Quality Fighter/Attack Aircraft in 2010



■ Typhoon-2			4						
■ Tornado ADV			15						
■ Tornado IDS			85						
■ Mirage 2000							12	62	
■ MiG-29	35								18
■ MiG-25									
■ Su-25	13								
■ Su-24	30								
■ Su-20/22									30
■ F-18					39				
■ F-16				21		12		85	
■ F-15S			70						
■ F-15C/D			84						
■ F-14	44								
■ F-4D/E	65								
■ Saegheh	3								

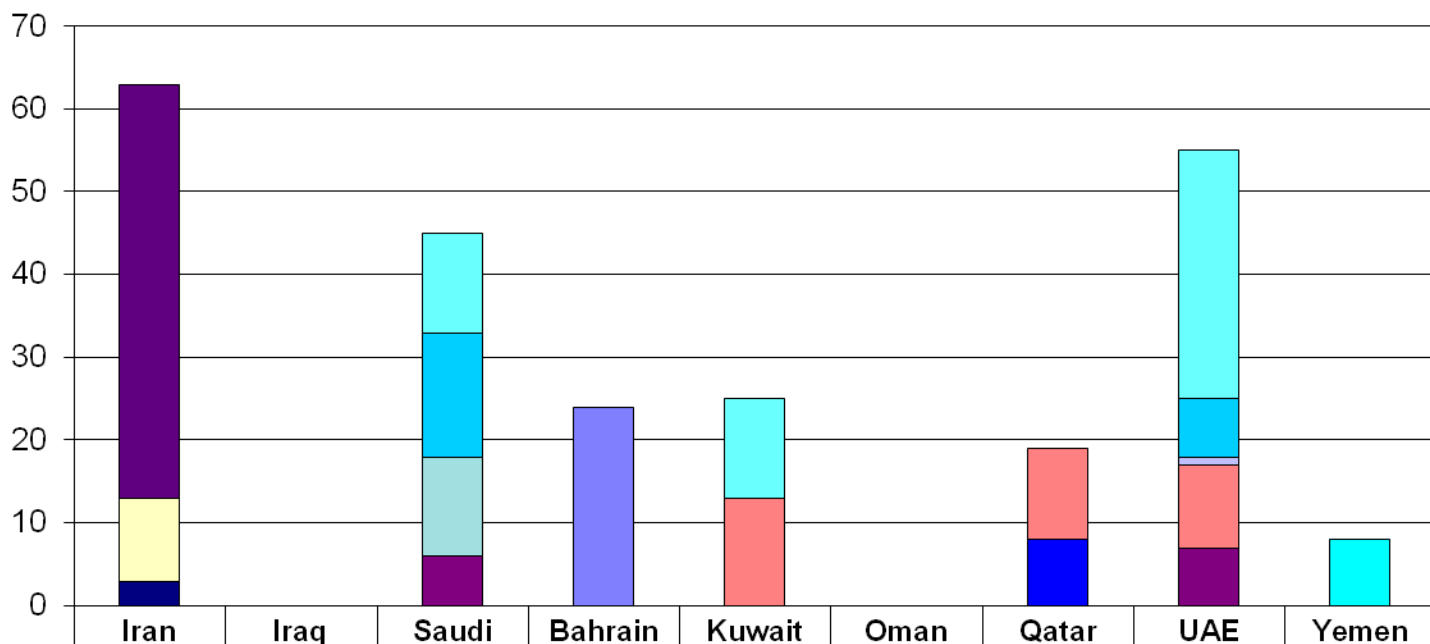
# Comparative Gulf AC&W, ELINT, and Reconnaissance Aircraft, 2010

P-F3 Orion



Source: Adapted by Anthony H. Cordesman from IISS, The Military Balance, various editions.

## Comparative Gulf Armed Helicopters: 2010



	Iran	Iraq	Saudi	Bahrain	Kuwait	Oman	Qatar	UAE	Yemen
AH-64/AH-64D			12		12			30	
AS-565			15					7	
AS-550C3								1	
AS-532 Exocet			12						
SA-342 HOT					13		11	10	
AH-1J	50								
AH-1E				24					
SH-3D	10								
Commando Exocet							8		
AS-332 Exocet			6					7	
Mi-35 Hind									8
RH-53D	3								

## Iranian UAV Projects / Assets 2009

Prime Manufacturer	Designation	Development / Production	Operation	Payload Wt.	Endurance (hr)	Range	Ceiling (ft)	Mission
Unknown	Stealth	Underway / Underway	Deployed			700 km		R/S*
HESA	Ababil (Swallow)	Complete / Underway	Deployed	45 kg	1.5+	150 km	14,000	Multiple variants for R/S* - attack - ISR**
Shahbal Group, Sharif Univ.	Shahbal	Underway		5.5 kg		12 km	4,500	R/S*
Asr-e Talai Factories	Mini-UAV	Underway						Surveillance
FARC	Sobakbal	Underway / Underway	Deployed	0.35 kg	2	2.7 - 13.5 mi	19,686	Surveillance
Qods Aeronautics Industries	Mohajer II/III (Dorna); Mohajer IV (Hodhod); Saeqeh I/II; Tallash I/Endeavor; Tallash II Hadaf 3000	Complete / Underway	Deployed					Multirole aka Lightning Bolt Target drone - aka Target 3000

Source: Adapted by Adam C. Seitz from AIAA Aerospace 2009 Worldwide UAV Roundup; available at: [http://www.aiaa.org/Aerospace/images/articleimages/pdf/UAVs\\_APR2009.pdf](http://www.aiaa.org/Aerospace/images/articleimages/pdf/UAVs_APR2009.pdf).

\*R/S: Reconnaissance / Surveillance; \*\*ISR: Intelligence / Surveillance / Reconnaissance

# Gulf Air Balance

## Air Bases and Air Force Order of Battle (2009)



### Three Main Iranian Nuclear Facilities

- Natanz: Uranium Enrichment Facility
- Arak: Heavy Water Nuclear Reactor and Possible Future Plutonium Production Reactor
- Esfahan: Nuclear Research Center. Uranium Conversion Facility (UCF)

	Combat A/C	Attack Helo's
Iran	319	95
Iraq	-	37
Kuwait	50	45
Bahrain	33	16
Qatar	18	25
UAE	184	67
Oman	64	41
Saudi Arabia	278	67
Yemen	179	18

### Iran Airbases

Tabriz	F-5E/F, MiG-29
Hamadan	F-4E/D Su-24
Dezful	F-5E/F
Bushehr	F-4E/D F-14
Bandar Abbas	2 Helicopter Wings
Shiraz	Su-25 Su-24
Esfahan	F-5E Su-24
Tehran	MiG-29 Su-24
Zahedan	F-7M
Kermanshah	F-5E/F

Air Bases Source: Global Security.org  
Order of Battle Source: Anthony Cordesman CSIS

# Range of Iran's Air Power



## Mission Profile: Hi-Lo-Hi

F-4E (Bushehr):  
(4) MK83 1000lb Bombs  
(1) 600 Gallon Fuel Tank  
10 Minutes loiter time  
Range = 400 nmi

SU-24 (Shiraz):  
(4) 500 kg/1000 lb Bombs  
(1) 400 gallon tank  
10 minutes loiter time  
Range = 590 nmi

SU-25 (Shiraz):  
(4) 500kg/1000lb Bombs  
(1) 400 gallon tank  
(2) 10 minutes loiter time  
Range = 600 nmi

## Iranian Surface-to-Air Forces

- **Only modern systems are short-range manportable systems and some 30 short-range Russian TOR-Ms suitable for point defense.**
- **Other SHORAD systems consist of 30 short-range range Rapier fire units and 15 Tigercats of uncertain operational status.**
- **Longer -range SAMs include 150+ US IHawks, 45 Russian SA-2s 10 SA-5s, and some CSA-1 Chinese versions of the SA-2. All are obsolete.**
- **Limited modernization of electronics and command and control and radar system, but vulnerable to electronic countermeasures, anti-radiation missiles.**
- **Only possible option to modernize major SAM systems, and acquire some ATBM capability is Russia S-300 (S400), and associated C3 and radar systems.**
- **Russia publicly rejected such sales after passing of new UN Sanctions in July 2010.**

# Iranian Surface-to-Air Missile/Air Defense Updates

- **April 21, 2010**
  - **Minister of Defense, General Ahmad Vahidi reports that “Mersad” (Ambush), Iran’s first advanced medium-range air defense missile system, is capable of flying up to 20km in height with a range of 40 km.**
  - **[Mersad] “can hit any modern aircraft flying at low or medium altitudes”**
  - **“More advanced than the US-made ‘Hawk’ missiles and is equipped with advanced radar surveillance as well as complicated software and hardware systems”**
  - **According to the minister, Mersad’s mass production has already started within Iran’s defense ministries, and will be delivered to Iran’s armed forces during the current Iranian year (started March 21)**
- **May 2, 2010**
  - **General Vahidi reports the production of an updated version of an anti-cruise missile system**
  - **According to Iranian reporting, “Iranian experts have successfully built a short-range air-defense system which can fire 4,000 rounds per minute.”**
  - **Vahidi also reports that, “the ministry is now working on different short-range, mid-range, and long-range air-defense systems”**



## Iranian Surface-to-Air Missile/Air Defense Updates - II

- **July 25, 2010**

- IRGC Lieutenant Commander General Hossein Salami stated "We have reached a never-ending point in (increasing) the quantity of ballistic missiles."
- According to Iranian media reporting, "The Iranian Defense Ministry's Aerospace Organization has made great achievements in designing and producing missiles, including the surface-to-surface solid-fuel Sejil missiles, the long-range Shahab-3 ballistic missile which has a range of up to 2,000 km, and Zelzal and Fateh missiles."
- Iranian Defense Minister Brigadier General Ahmad Vahidi stated "Mesbah (Lantern) 1 air-defense system has been designed and built to counter air attacks, different kinds of airplanes, cruise missiles, choppers and other air threats in low altitudes."
- He further stated that "the Mesbah 1 missile shield is also capable of tracing and intercepting Unmanned Aerial Vehicles (UAVs)".

- **August 2, 2010**

- Israeli media reporting has shown concern towards a the expected launch of an Iranian spy satellite capable of looking at Israeli territories from space.
- The Iranian government stated two weeks ago that it intended to launch a new satellite known as the "Rasad"(Lookout).
- Tal Inbar, the director of the Space and UAV Research Center at the Fisher Institute, said "a close eye must be kept on the launcher that will carry the satellite to space, since no distinction should be made between the satellite launcher and Iran's ballistic capabilities".
- He further stated, "if the launch is carried out by the new launcher that was presented by the Iranians last February, then this launcher has four engines, which also shows the ability to launch missiles with intercontinental range".

## **Iranian Surface-to-Air Missile/Air Defense Updates - III**

### **– August 4, 2010**

- Iranian media reporting has stated that Iran has received 4 S-300s missile batteries: 2 from Belarus and 2 from another unnamed source**
- Russia signed a contract in 2007 stating the sale of these missiles, however has since not delivered due to the most recent round of UN sanctions and general “technical complications”**
- The most advanced versions of the S-300 are capable of shooting down aircraft, cruise missiles and ballistic missile warheads at ranges of over 90 miles (144 kilometers) and at altitudes of about 90,000 feet (27,432 meters).**
- No confirmation of deliveries or operational status. No indication of exact configuration and capability of the systems.**

# Russian Claims of Lost Arms Sales

CEP20100803950154 Moscow RIA-Novosti in Russian 0950 GMT 03 Aug 10

Russian expert details losses from cancelled military contracts with Iran

Russia's losses as a result of abandoning military-technical cooperation with Iran may amount to 11-13bn dollars, the director of a world trade arms analysis centre (TsAMTO), Igor Korotchenko, has told RIA Novosti. [Passage omitted] ...One of the most promising segments of military-industrial cooperation between Russia and Iran is air defence, Korotchenko said.

In late 2007 a contract was signed to supply to Tehran five battalions of the S-300PMU-1 antiaircraft missile systems worth about 800m dollars. If this contract is cancelled, Moscow will have to pay Iran a penalty for breaking its obligations which may reach up to 10 per cent of the contract amount. Thus, Russia's overall losses caused by the cancellation of the contract for the supply of S-300 missile systems can be assessed at 900m dollars [as received].

In addition, Iran was considered as a potential customer for Buk-M2E medium-range antiaircraft missile systems to create an echeloned system of the country's air defence. Experts put the prospective number of Buk systems that could be purchased as part of this deal at 18 to 36. Profits lost on this deal are estimated at 250-500m dollars.

In January 2007 Russia completed the supply to Iran of 29 Tor-M1 short-range antiaircraft missile systems worth 700m dollars. These Tors have now been deployed to cover Iran's most important state and military facilities against a possible attack from air. If Russia refuses to supply spare parts and missiles for these Tor-M1 systems, its losses can be approximately estimated at 50-80m dollars. ...Earlier Tehran voiced its intention to purchase up to 1,000 Russian Igla man-portable air defence systems. The amount of the potential contract could be up to 500m dollars. The Iranian side has also showed interest in purchasing Gamma-DE and Kasta-2E2 radars. In this case Russia's losses could be assessed at 100-200m dollars.

Thus, having stopped military-industrial cooperation with Iran, in the air defence segment alone Russia will lose from 1.8bn to 2.2bn dollars, Korotchenko said. In TsAMTO's estimates, in 2010-2025 similar losses caused by freezing military-industrial cooperation with Iran in the naval equipment segment will amount to 2.2bn-3.2bn dollars; in the aircraft segment (warplanes), 3.4bn-3.7bn dollars; in terms of Ground Troops equipment, 2.1bn-2.5bn dollars, in terms of helicopters, about 1.1bn dollars. Losses caused by winding up space cooperation are estimated at 200m dollars, while losses caused by the cancellation of supplies to Iran of spare parts for previously purchased armaments and hardware, at 200-250m dollars.

# Gulf Land-Based Air Defenses In 2010

Country	MajorSAM	Light SAM	AA Guns
Bahrain	8 I Hawk MIM-23B	60 R BS-70 18 FIM-92A Stinger 7 Cro tale	27 guns 15 Oerlikon 35mm 12 L/70 40 mm
Iran	16/150 I Hawk 3/10 SA-5 45 SA-2 Guideline	SA-7/14/16, HQ-7 29 SA-15 Some QW-1 Misaq 29 TOR-M1 Some HN-5 5/30 Rapier 10 Pantsyr (SA-22) Some FM-80 (Ch Crotale) 15 Tigercat Some FIM-92A Stinger	1,700 Guns ZSU-23-4 23mm ZPU-2/4 23mm ZU-23 23mm M-1939 37mm S-60 57mm ZSU-57-2
Iraq			
Kuwait	5/24 I Hawk Phase II 5/40 Patriot PAC-2	12 Aspide 12 Starburst Aspide Stinger	12 Oerlikon 35mm
Oman	None	Blowpipe 8 Mistral 2 S P 12 Pantsyr S1E  34 SA-7 6 Blindfire S7 13 Martello 20 Javelin 40 Rapier	26 guns 4 ZU-23-2 23 mm 10 G DF-005 Skyguard 35  12 L-6040 mm
Qatar	None	10 Blow pipe 12 FIM-92A Stinger 9 Roland II 24 Mistral 20 SA-7	?
Saudi Arabia	16/128 I Hawk 4-6/16-24 Patriot 2 17/73 Shahine Mobile	40 Crotale 500 Stinger (AR MY) 500 Mistral (AD F)	1,220 guns 92 M-163 Vulcan 20mm 30 M-167 Vulcan 20mm
(NG)	16/96 PAC-2 launchers 17 ANA/FPS-117 radar 73/68 Crotale/Shahine	500 FIM-43 Redeye 500 Redeye (AD F) 73-141 Shahine static	850 AMX-30SA 30mm 128 G DF Oerlikon 35mm 150 L-70 40mm (in store) 130 M-2 90mm (NG)
UAE	2/6/36 I Hawk	20+ Blowpipe 20 Mistral Some Rapier Some Crotale Some RB-70 Some Javelin Some SA-18	62 guns 42 M-3VDA 20mm SP 20 G CF-BM2 30mm
Yemen	Some SA-2, 3 Some SA-6 SP	Some 800 SA-7 Some SA-9 SP Some SA-13 SP Some SA-14	530 guns 20 M-163 Vulcan SP 20mm 50 ZSU-23-4 SP 23mm 100 ZSU-23-2 23mm 150 M-1939 37mm 50 M-167 20mm 120 S-60 57mm 40 M-1939 KS-12 85mm

Source: Adapted by Anthony H. Cordesman from IISS, [The Military Balance](#), [Periscope](#), JCSS, [Middle East Military Balance](#), [Jane's Sentinel](#) and [Jane's Defense Weekly](#). Some data adjusted or estimated by the author.

## Naval Threats

- Iranian effort to “close the Gulf.”
- Iranian permissive amphibious/ferry operation.
- Variation on 1987-1988 “Tanker War”
- Raids on offshore and critical shore facilities.
- “Deep strike” with air or submarines in Gulf of Oman or Indian Ocean.
- Attacks on US facilities

### *But:*

- *Low near-term probability.*
- *High risk of US and allied intervention.*
- *Limited threat power projection and sustainability.*
- *Unclear strategic goal.*

## Iranian Naval Forces

- Iran has an 18,000 man Navy and 12,000-15,000 man Naval Guards The Navy is in charge of operations in the Caspian and the Gulf of Oman. The Naval branch is in charge of operations in the Gulf, which is the focus of Iran's naval and amphibious capabilities for irregular warfare.
- Both lack modern surface vessel combat capability and are dependent on four obsolete frigates and three obsolete corvettes from the time of the Shah with limited modernization and uncertain combat readiness.
- Iran seems to be building its own prototype Mowaj-class corvette/destroyer, but it is not yet operational.
- The IN has three Russian Kilo-class submarines – which some reports indicate can lay smart mines and fire long-range, homing torpedoes – and the IRGC has at least 7 North Korean/Iranian-made Yono and Nahand-class midget submarines and semi-submersible small craft,
- The IN has a naval aviation branch with 3 aging P-3F maritime patrol and airborne command and control aircraft, three Falcon aircraft modified for electronic warfare and intelligence, and anti-submarine and mine warfare helicopters.
- There are some 3,000-5,000 Marines.

*(IRGC-N described in Asymmetric Warfare Analysis)*

# Iranian Navy Updates - I

- **November, 23, 2009**
  - According to the Commander of the Iranian Navy, Admiral Habibollah Sayyari, “The Navy will never allow aliens in the Caspian Sea”
  - He further stated that the “defense capabilities have doubled compared to those at the time of the Iraq-imposed war”
  - Upon commenting on Iran’s naval resource capabilities, he said, “the Navy has achieved self-sufficiency in production of Naval equipment...All the hardware and software being produced by the Iranian Navy is indigenous”
- **February 20, 2010**
  - Rear Admiral Amir Rastegari stated that “the production of destroyers will continue and in the next 2 years, the second vessel will be delivered to Iran’s Navy”
  - He further stated that by launching the “Jamaran Destroyer”, Iran joined 14 countries which manufacture destroyers and cruisers in the world.
  - He added that industrial and academic centers cooperated in this effort, and this cooperation would lead to further advancements in the defense industry.
- **April 10, 2010**
  - Sayyari has stated that presence of the Jamaran destroyer in the Gulf of Adan indicates Iran’s might in the Gulf.
  - The Jamaran Destroyer is 100 meters long and seven floors, meant to carry choppers, and equipped with the most sensitive and sophisticated equipment according to Iranian media reporting.

## Iranian Navy Updates - II

- **June 22, 2010**
  - According to the Commander of the IRGC Naval Forces, Ali Fadavi, “The trend of equipment, modernization, and change in the IRGC will continue at a higher speed until the specified goals are attained”
- **June 24, 2010**
  - Fadavi stated, in response to the US’ presence in the Persian Gulf, “This force is mighty and capable of reacting very especially and very appropriately to inspection against Iranian ships”
  - Regarding the current strength of IRGC’s Naval Forces, “...right now we are equipped with hundreds of missile launcher ships among our thousands of warships, and the Americans are quite unfamiliar with the capabilities of the IRGC Naval Forces” -- Fadavi
- **July 19, 2010**
  - General Vahidi stated that “new domestically made submarines would be delivered to Iran’s Navy by July 27, 2010”
  - He further stated that these submarines would be highly equipped with modern equipments, and would improve the Navy’s maneuvering capabilities
- **July 25, 2010**
  - According to Iranian reporting, a senior Iranian military figure stated that “each hostile US warship located in the Persian Gulf will be swarmed by over 100 Iranian military vessels”
  - Rear Admiral Morteza Saffari stated that the US warships located in the Persian Gulf are “easy targets” and Iran is “able to inflict heavy losses on these ships”
  - The IRGC has stated that its missiles can hit any target across the Persian Gulf and all gunboats are within its range.

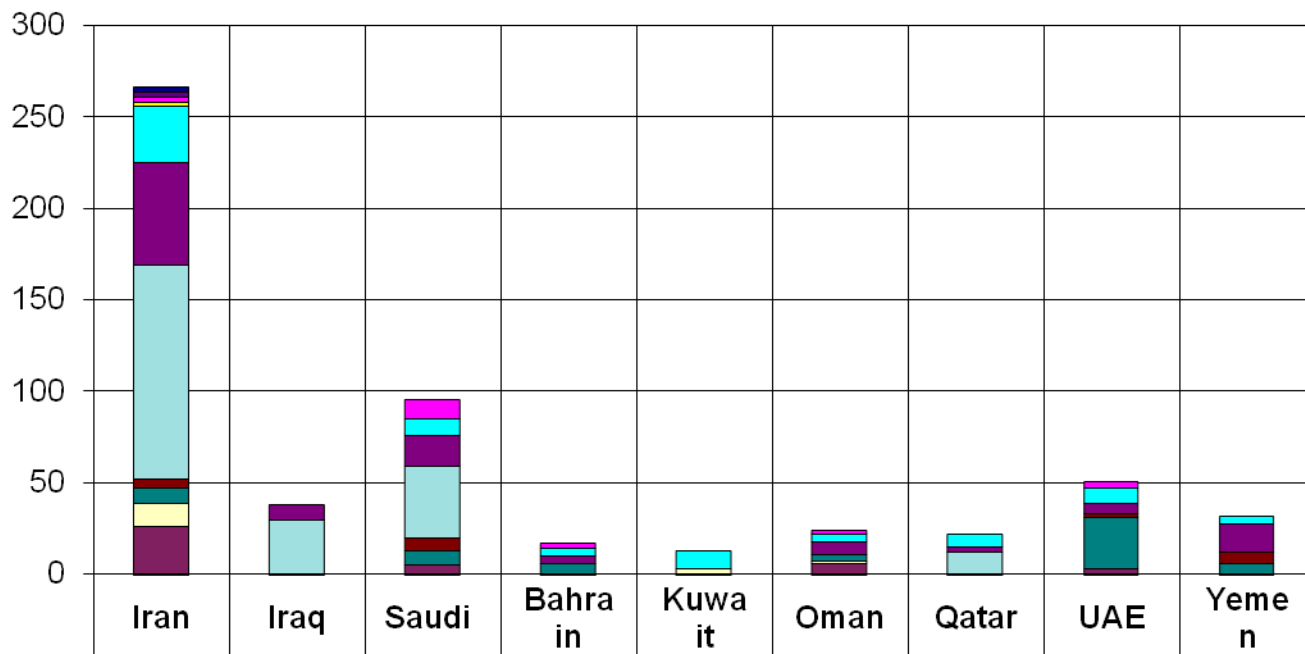


## Iranian Navy Updates - III

- **August 8, 2010**

- **According to Iranian reporting, Iran has developed the capabilities and launched “four home-built advanced submarines to protect shipping vessels in the Persian Gulf and the Sea of Oman**
- **Iranian Military officials state that the “Ghadir” class submarines are “light” and enjoy “exceptionally advanced capabilities and have been outfitted with highly advanced torpedoes”**
- **They seem to be copies of North Korean small submarines. If four more are actually deployed, this would raise the total to eight.**
- **Iranian Military officials further state that these “submarines can easily evade detection as [they are] equipped with sonar evading technology and can fire missiles and torpedoes simultaneously.”**
- **The IN and IRGC also seem to have semi-submersible vessels that could attack a ship on contact and possibly fire torpedoes.**
- **The commander of the Islamic Revolution Guards Corps (IRGC), Brig. Gen. Yadollah Javani, said Saturday Iran’s enemies have never dared to attack because of the vulnerability of the waterway...If anything happens in the Persian Gulf and the Strait of Hormuz is closed, the possibility of using this route will be lost for decades, and this will be a great tragedy for the global economy.”**

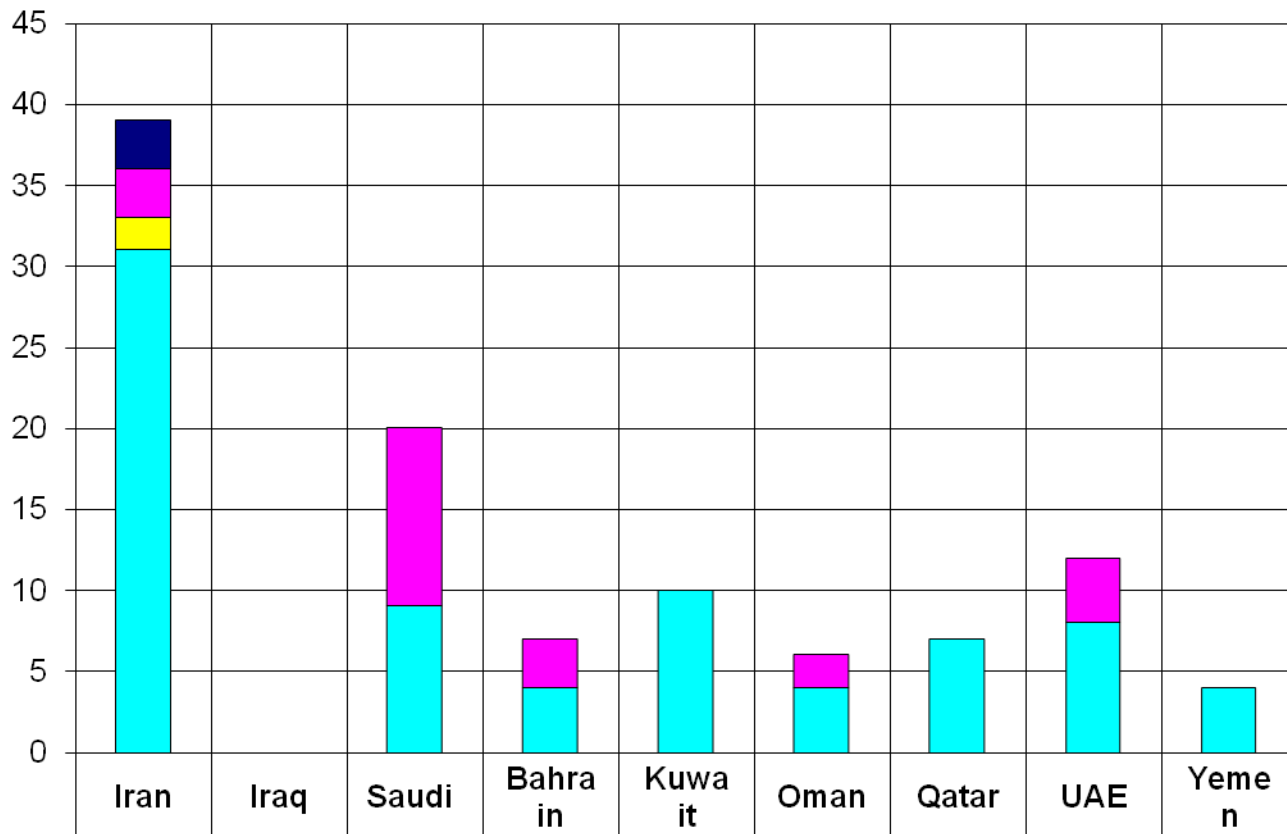
# Comparative Naval Combat Ships in 2010



<b>Submarines</b>	3								
<b>Midget Submarines</b>	3								
<b>Major Missile Combat</b>	3		11	3		2		4	
<b>Major Other Combat</b>	2								
<b>Missile Patrol</b>	31		9	4	10	4	7	8	4
<b>Other Patrol</b>	56	8	17	4		7	3	6	16
<b>Armed Boats</b>	117	30	39				11		
<b>Mine</b>	5		7					2	6
<b>Landing Craft</b>	8		8	5		4		28	5
<b>Amphibious Ships</b>	13				2	1	1		1

Source: Adapted by Anthony H. Cordesman from ISS, *The Military Balance*, various editions.

# Major Combat Warships in 2010



■ Submarines	3							
■ Major Missile Combat	3		11	3		2		4
■ Major Other Combat	2							
■ Missile Patrol	31		9	4	10	4	7	8

Source: Adapted by Anthony H. Cordesman from IISS, The Military Balance, various editions and material provided by US and Saudi experts.

## **The GCC Threat to the GCC**

- **Vast lead in military spending and arms imports**
- **Support from US, Britain, France**

***But,***

- **Poor Mission Focus with Limited Coordination**
- **Lack of Integration, Standardization**
- **Problems in Large-Scale Exercises and Training; Military Realism**
- **Problems in Jointness – including security services, police, and intelligence – and combined arms.**
- **Lack of Balanced Force Development: Manpower Quality and Sustainability**

# Regional Cooperation on Iran?

- **Limited current regional cooperation among the Gulf nations with regards to Iran.**
- **Region-wide drive to bolster naval forces to countering the perceived growing threat from Iran.**
- **Oman, like Syria and Qatar, sees in Iran an important political and economic ally that is too powerful and too potentially dangerous to ignore, let alone antagonize; while defying Egypt, Saudi Arabia and other Arab nations in their efforts to curb Iranian influence and Nuclear ambitions.**
- **United Arab Emirates, which is battling with Iranian leaders over the title to three Persian Gulf islands, has done little to stop billions of dollars in annual trade with Iran.**
- **Sunni-led Arab countries are concerned over Tehran's influence with the Shiite-dominated government in Iraq.**
- **Qatar says it is mediating between Iran and Arab powers such as Egypt and Saudi Arabia, where the ruling family feels threatened by Iranian power.**
- **Continued developments in Saudi and Egyptian outreach to Arab nations to unite against Iranian influence and Nuclear Ambitions as well as outreach efforts to Syria in efforts to break Iranian-Syrian ties.**
- **Continued U.S. engagement and “security umbrella” seems to be key to any resemblance of Regional Cooperation in regards to Iran.**

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# Iran, the Gulf, and Strategic Competition: Asymmetric Warfare

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*The Challenge of Asymmetric  
Warfare:*

*Intimidation, Deterrence, and  
Warfighting*

## **Most Likely Foreign Threats Are Not Formal Conflicts**

- **Direct and indirect threats of using force. (I.e. Iranian efforts at proliferation)**
- **Use of irregular forces and asymmetric attacks.**
- **Proxy conflicts using terrorist or extremist movements or exploiting internal sectarian, ethnic, tribal, dynastic, regional tensions.**
- **Arms transfers, training in host country, use of covert elements like Quds force.**
- **Harassment and attrition through low level attacks, clashes, incidents.**
- **Limited, demonstrative attacks to increase risk, intimidation.**
- **Strike at critical node or infrastructure.**



# Iran: Threat or “Competitor”

## Non-Military Competition

- *Ideology, religion, and political systems*
- *“Terrorism” and violent extremism vs. “counterterrorism”*
- *Energy, sanctions, and global economic impacts*
- *Arms control, arms exports, and arms imports*
- *International diplomacy*

## Military Competition

- *Weapons of mass destruction*
- *Conventional forces*
- *Asymmetric and irregular warfare*
- *Proxy use of state and non-state actors*
- *Threat and intimidation*

## Nations and Sub-Regions of Competition

- *Gulf Cooperation Council countries*
- *Yemen*
- *Iraq*
- *Jordan*
- *Syria*
- *Lebanon*
- *Israel*
- *Gaza and West Bank*
- *Morocco*
- *Pakistan*
- *Turkey*
- *Afghanistan*
- *Central Asia*
- *Europe*
- *Russia*
- *China*
- *Japan and Asia*
- *Venezuela, Cuba, Brazil, Argentina*

# Iran's Strategic Position: DNI Assessment - February 2010 - I

## Iran: Growing Authoritarianism and Efforts to Expand its Regional Influence

The Iranian Government faced a major political challenge last summer when a widespread perception of fraud during the June presidential election provoked large-scale popular demonstrations and infighting among regime elites. Conservative hardliners reacted by cracking down on protestors and regime opponents, and hardliners now are using the crisis and its aftermath to further consolidate their power. Despite Iran's internal turmoil, we judge that Tehran's foreign policy will remain relatively constantly driven by a consistent set of goals, and that its efforts to expand its regional influence and ongoing support for terrorist and militant groups will continue to present a threat to many countries in the Middle East and to US interests.

Iran's political crisis has widened splits in the country's political elite and undercut the regime's legitimacy. Although Iranian politics remain in flux, Supreme Leader Khamenei, President Ahmadi-Nejad, and their hardline conservative allies are likely to focus over the next year on consolidating their power. Strengthened conservative control will limit opportunities for reformers to participate in politics or organize opposition. The regime will work to marginalize opposition elites, disrupt or intimidate efforts to organize dissent, and use force to put down unrest. Iran's economic performance has been hurt by softening oil prices and longstanding Iranian policies that discourage the private sector and foreign investment, but the economy is not in crisis. Iran's economy is heavily dependent on oil and hydrocarbons provide 80 percent of its foreign exchange revenue, making Tehran vulnerable to downturns in oil prices. Nonetheless, Iran maintains foreign currency reserves to hedge against a moderate fall in oil prices. International sanctions and pressure have aggravated Iran's economic woes by disrupting and increasing the cost of international business, slowing some projects and programs, and contributing to Iran's economic slowdown.

Iran has made contingency plans for dealing with future additional international sanctions by identifying potential alternative suppliers of gasoline, including China and Venezuela. Tehran also has resorted to doing business with small, non-Western banks and dealing in non-US currency for many financial transactions. Iranian opposition press has reported the involvement of the Revolutionary Guard and Iranian intelligence in the smuggling of crude oil as a way of both skirting and profiting from sanctions. Despite these activities and Iran's gasoline subsidy cuts, which could in part serve to mitigate some effects of the embargo, we nonetheless judge that sanctions will have a negative impact on Iran's recovery from its current economic slowdown.

# Iran's Strategic Position: DNI Assessment - February 2010 - II

Iran's overall approach to international affairs probably will remain relatively constant and will continue to be driven by longstanding priorities of preserving the Islamic regime, safeguarding Iran's sovereignty, defending its nuclear ambitions, and expanding its influence in the region and the Islamic world. We judge Iran's influence and ability to intervene in the region will remain significant and that it will continue to support terrorist and militant groups to further its influence and undermine the interests of Western and moderate regional states.

In Iraq, we expect Iran will focus on building long-term influence by trying to ensure the continued political dominance of its Shia allies, expand Iran's political and economic ties to Iraq, and limit Washington's influence. We assess Tehran continues to train, equip, and fund select Iraqi Shia militant groups.

In Afghanistan, Iran is providing political and economic support to the Karzai government, developing relationships with leaders across the political spectrum, and providing lethal aid to elements of the Taliban to block Western--especially US--entrenchment in the country. Tehran likely will continue to provide reconstruction, humanitarian, and economic initiatives intended to bolster Afghan stability. Iran also will seek to expand its influence at the expense of the United States and other competitors, and to work with Kabul on border security and counternarcotics initiatives.

In the Levant, Tehran is focused on building influence in Syria and Lebanon and expanding the capability of key allies. Tehran continues to support groups such as Hizballah, HAMAS, and the Palestinian Islamic Jihad (PIJ), which it views as integral to its efforts to challenge Israeli and Western influence in the Middle East. Hizballah is the largest recipient of Iranian financial aid, training, and weaponry, and Iran's senior leadership has cited Hizballah as a model for other militant groups. Iran also provides training, weapons, and money to HAMAS to bolster the group's ability and resolve to maintain its armed resistance to Israel and opposition to Israeli-Palestinian peace negotiations.

# The Broader Patterns in Iranian Activity

Iranian Actors	Related States/ Non-State Actors	Key Target/Operating Country
Revolutionary Guards	Iran	Iraq
Al Quds force	Syria	Israel
Vevak/other intelligence	Hezbollah	Gaza/West Bank
Arms transfers	Hamas	Egypt
Military and security advisors	Mahdi Army	Kuwait
Clerics, pilgrims, shrines	Yemeni Shi'ites	Bahrain
Commercial training	Bahraini Shi'ites	Yemen
Finance/investment	Saudi Shi'ites	Lebanon
Investment/training companies		Afghanistan
Education: scholarships, teachers		Venezuela
Cultural exchanges		Morocco
Athletic visits		

# Odierno on Iran's Role in Iraq

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**The U.S. military is beefing up security around its bases in Iraq in anticipation of Iranian-backed militants looking to score propaganda points by attacking American Soldiers leaving the country, the U.S. commander said Tuesday.**

**Gen. Ray Odierno said the Iranian threat to U.S. forces has increased as Tehran looks to boost its political and economic influence in Iraq in the face of a decreasing U.S. military presence.**

**"There's a very consistent threat from Iranian surrogates operating in Iraq," and security has been stepped up at some U.S. bases, Odierno told reporters in Baghdad. He added that joint operations with Iraqi forces against suspected Iranian-sponsored insurgents have also been increased, while the scheduled withdrawal proceeds apace.**

**Though no attacks have yet occurred, said Odierno, there was credible intelligence some Iranian-backed groups were planning strikes on U.S. forces. Odierno said militants were hoping to make propaganda out of attacks on withdrawing U.S. troops to make it seem as though they were being driven out. "For years, these groups have been talking about attacking U.S. forces to force them to leave," Odierno said.**

**While connections between certain groups of Shiite militants in Iraq and the government in Tehran were "always very convoluted," Odierno said that at least some have ties to the powerful Iranian Revolutionary Guard Corps, a heavily armed paramilitary force tasked with protecting the clerical regime.**

**"Whether they are connected to the Iranian government, we can argue about that," Odierno said. "But they are clearly connected to the IRGC."**

## Iranian Asymmetric Doctrine

- **Iran sends signals about its use of asymmetric warfare through its military parades and exercises.**
- **The IRGC often claims to conduct very large exercises, sometimes with 100,000 men or more. The exact size of such exercises is unclear, but they are often a fraction of IRGC claims.**
- **By displaying both its real and virtual military (e.g. naval) fighting capabilities through electronic, printed and network media, and through official statements, Iran seek to achieve the following politico-diplomatic and propaganda ends (4Ds):**
  - **Defiance (to maintain a course of resistance, targeting primarily the Western political will and system).**
  - **Deception (on the real state of Iranian warfighting capabilities, targeting the Western military establishments).**
  - **Deterrence (with the IRI military “might”, targeting Western public opinion, delivered through the media).**
  - **Demonstration (of the outreach of its own power, targeting the Iranian people and the Moslem world).**

## **“Going Nuclear:” Intimidation as a Form of Terrorism and Asymmetric Warfare**

- **Even the search for nuclear power is enough to have a major effect.**
- **Development of long range missiles add to credibility, and pressure.**
- **Crossing the nuclear threshold in terms of the bomb in the basement option.**
- **Threats to Israel legitimize the capability to tacitly threaten Arab states. Support of Hamas and Hezbollah increase legitimacy in Arab eyes -- at least Arab publics.**
- **Many future options: stockpile low enriched material and disperse centrifuges, plutonium reactor, underground test, actual production, arm missiles, breakout arming of missiles.**
- **Declared forces, undeclared forces, lever Israeli/US/Arab fears.**

## **“Going Asymmetric:” Substituting Asymmetric Forces for Weak Conventional Forces**

- **Combined nuclear and asymmetric efforts sharply reduce need for modern conventional forces -- which have less practical value**
- **Linkages to Syria, Lebanon, other states, and anti-state actors like Hamas and Hezbollah add to ability to deter and intimidate/lever.**
- **Can exploit fragility of Gulf, world dependence on oil exports, GCC dependence on income and imports.**
- **Threats to Israel again legitimize the capability to tacitly threaten Arab states.**



## “Swarming” vs. “Attrition”

- Iran practices “swarming” targets in the Gulf with large numbers of small craft, shore-based anti-ship missiles, missile armed aircraft, and increasing support from UAVs/UCAVs.
- Tactics strongly favor surprise and/or sudden escalation to be successful.
- Also studies patterns of slow, episodic low-level attacks that intimidate, alter shipping patterns and insurance, threaten/attack offshore and coastal targets at levels sufficient to put on military pressure without provoking major conflict or retaliation.
- Exercises are a form of intimidation, as are shifts in deployments, weapons and technology tests and announcements.
- No fixed boundaries between “conventional” and asymmetric” warfare, or threats, low level military acts, and conflict.
- Can reinforce conventional threats/deterrence by use of proxies in other areas.

## Some Tangible Examples

- **Iranian tanker war with Iraq**
  - **Oil spills and floating mines in Gulf.**
  - **Libyan “stealth” mining of Red Sea.**
  - **Use of Quds force in Iraq. Iranian use of UAVs. Border and coastal “incidents.”**
  - **Arms transfers, in cooperation with Syria, to Hezbollah.**
  - **“Incidents” in pilgrimage in Makkah.**
  - **Support of Shi’ite groups in Bahrain.**
  - **Missile and space tests; expanding range of missile programs (future nuclear test?).**
  - **Naval guards seizure of British boat, confrontation with US Navy, exercises in Gulf.**
  - **Development of limited “close the Gulf” capability.**
  - **Flow of illegal's and smuggling across Yemeni border.**
  - **Hamas/PIJ arms transfer and their rocket attacks on Eilat, Aqaba.**
- In August 2010**

## **The Expanding Roles and Mission of the IRGC**

- **Iran's Deputy Army Commander Brigadier General Abdolrahim Moussavi has announced that Iran is commitment to expanding its strategic reach, arguing that, "In the past, our military had to brace itself for countering regional enemies. This is while today we are faced with extra-regional threats."**
- **Iran upgraded a naval base at Assalouyeh in Iran's southern Bushehr province.**
  - **This base is the fourth in a string of IRGC bases along the waterway that will extend from Bandar Abbas to Pasa Bandar near the Pakistan border.**
  - **Part of, what IRGC's Navy Commander Rear Admiral Morteza Saffari describes as a new mission to establish an impenetrable line of defense at the entrance to the Sea of Oman.**

## Expanding IRGC Capabilities

- Forces can carry out extensive raids against Gulf shipping, carry out regular amphibious exercises with the land branch of the IRGC against objectives like the islands in the Gulf, and could conduct raids against countries on the southern Gulf coast.
- Iran could launch a coordinated attack involving explosives-laden remote-controlled boats, swarming speedboats, semi-submersible torpedo boats, FACs, kamikaze UAVs, midget and attack submarines, and shore-based anti-ship missile and artillery fire.
- Could “swarm” a U.S.-escorted convoy or surface action group transiting the Strait of Hormuz, and barrages of rockets with cluster warheads could be used to suppress enemy defensive fire and carrier air operations.
- Naval Guards work closely with Iranian intelligence and appear to be represented unofficially in some embassies, Iranian businesses and purchasing offices, and other foreign fronts.
- Iran has launched a domestic weapons procurement campaign aimed at improving its defense capabilities and has announced the development of 109 types of advanced military equipment over the past two years.
  - In December 2008 Iranian Navy Rear Admiral Habibollah Sayyari confirmed the delivery of two new domestically-built missile boats, Kalat (Fortress) and Derafsh (Flag), as well as a Ghadir-class light submarine to the Iranian navy.
  - The deputy commander of the IRGC's navy, Rear Admiral Ali Fadavi, told the Fars News Agency on 11 November 2008 that both unmanned speedboats and UAVs are now mass-produced in the country.
  - On December 6, 2008 the Iranian Navy test-fired a new surface-to-surface missile from a warship as part of exercises along a strategic shipping route. "The Nasr-2 was fired from a warship and hit its target at a distance of 30 km (19 miles) and destroyed it," Iranian state run radio reported.

## **IRGC Commander and Asymmetric Strategy - I**

- **On September 1, 2007, Khamenei promoted Mohammad Ali Jafari, then coordinator of the IRGC Research and Command Center, to the rank of major general and the post of commander in chief of the IRGC.**
- **Throughout his military career Jafari has emphasized asymmetrical warfare and developing Iran's ballistic missile capabilities throughout his military career**
- **In 1992, he was appointed commander of the ground forces. One of the tasks he carried out in this capacity was "to study and assess the strengths and weaknesses of America [as reflected] in its attacks on Afghanistan and Iraq."**
- **Jafari has outlined the strategy he means to promote as IRGC commander, reiterating his commitment to developing Iran's ballistic missile capabilities and the asymmetrical warfare capacities of the IRGC:**
  - **Asymmetrical warfare... is [our] strategy for dealing with the considerable capabilities of the enemy. A prominent example of this kind of warfare was [the tactics employed by Hizbullah during] the Lebanon war in 2006... Since the enemy has considerable technological abilities, and since we are still at a disadvantage in comparison, despite the progress we have made in the area of equipment, [our only] way to confront [the enemy] successfully is to adopt the strategy [of asymmetric warfare] and to employ various methods of this kind."**

## **IRGC Commander and Asymmetric Strategy - II**

- **IRGC commander Mohammad Ali Aziz Jafari statements on asymmetric strategy continued:**
  - **Jafari has said in the past that, in the case of a confrontation with the West, Iran will be willing to employ the organizations under its influence. In a January 2005 speech to intelligence commanders from the Basij and IRGC, Jafari - then commander of the ground forces - stated: "In addition to its own capabilities, Iran also has excellent deterrence capabilities outside its [own borders], and if necessary it will utilize them."**
  - **"the Revolutionary Guards [Corps] will invest efforts in strengthening its asymmetrical warfare capabilities, with the aim of successfully confronting the enemies."**
  - **"After September 11, [2001], all [IRGC] forces changed their [mode of] operation, placing emphasis on attaining combat readiness. The first step [towards achieving] this goal was to develop [a strategy] of asymmetrical warfare and to hold maneuvers [in order to practice it]."**

## **The Islamic Revolutionary Guards Corps**

- **125,000+, drawing on 1,000,000 Basij.**
- **Key is 20,000 Naval Guards, including 5,000 marines.**
  - **Armed with HY-3 CSS-C-3 Seersucker (6-12 launchers, 100 missiles, 95-100 km), and 10 Houdong missile patrol boats with C-802s (120 km), and 40+ Boghammers with ATGMs, recoilless rifles, machine guns.**
  - **Large-scale mine warfare capability using small craft and commercial boats.**
  - **Based at Bandar e-Abbas, Khorramshar, Larak, Abu Musa, Al Farsiya, Halul, Sirri.**
- **IRGC air branch reported to fly UAVs and UCAVs, and control Iran's strategic missile force.**
  - **1 Shahab SRBM Bde (300-500-700 km) with 12-18 launchers, 1 Shahab 3 IRBM Btn (1,200-1,280 km) with 6 launchers and 4 missiles each.**

## **IRGC Key Assets and Capabilities**

- **The IRGC has a wide variety of assets at its disposal to threaten shipping lanes in the Gulf, Gulf of Oman, and the Caspian Sea.**
- **3 Kilo (Type 877) and unknown number of midget (Qadr-SS-3) submarines; smart torpedoes, (anti-ship missiles?) and smart mine capability.**
- **Use of 5 minelayers, amphibious ships, small craft, commercial boats.**
- **Attacks on tankers, shipping, offshore facilities by naval guards.**
- **Raids with 8 P-3MP/P-3F Orion MPA and combat aircraft with anti-ship missiles(C-801K (8-42 km), CSS-N-4, and others).**
- **Free-floating mines, smart and dumb mines, oil spills.**
- **Land-based, long-range anti-ship missiles based on land, islands (Seersucker HY-2, CSS-C-3), and ships (CSS-N-4, and others. Sunburn?).**
- **Forces whose exercises demonstrate the capability to raid or attack key export and infrastructure facilities.**



## **IRGC Naval Branch**

- **The IRGC has a naval branch consists of approximately 20,000 men, including marine units of around 5,000 men.**
- **The IRGC is now reported to operate all mobile land-based anti-ship missile batteries and has an array of missile boats; torpedo boats; catamaran patrol boats with rocket launchers; motor boats with heavy machine guns; mines as well as Yono (Qadir)-class midget submarines; and a number of swimmer delivery vehicles.**
- **The IRGC naval forces have at least 40 light patrol boats, 10 Houdong guided missile patrol boats armed with C-802 anti-ship missiles.**
- **The IRGC controls Iran's coastal defense forces, including naval guns and an HY-2 Seersucker land-based anti-ship missile unit deployed in five to seven sites along the Gulf coast.**
- **The IRGC has numerous staging areas in such places and has organized its Basij militia among the local inhabitants to undertake support operations.**
- **IRGC put in charge of defending Iran's Gulf coast in September 2008 and is operational in the Gulf and the Gulf of Oman, and could potentially operate elsewhere if given suitable sealift or facilities.**
- **Can deliver conventional weapons, bombs, mines, and CBRN weapons into ports and oil and desalination facilities.**
- **Force consists of six elements: surface vessels, midget and unconventional submarines, missiles and rockets, naval mines, aviation, and military industries.**

## **IRGC Naval Branch Modernization**

- **Large numbers of anti-ship missiles on various types of launch platforms.**
- **Small fast-attack craft, heavily armed with rockets or anti-ship missiles.**
- **More fast mine-laying platforms.**
- **Enhanced subsurface warfare capability with various types of submarines and sensors.**
- **More small, mobile, hard-to-detect platforms, such as semi-submersibles and unmanned aerial vehicles.**
- **More specialized training.**
- **More customized or purpose-built high-tech equipment.**
- **Better communications and coordination between fighting units.**
- **More timely intelligence and effective counterintelligence/deception.**
- **Enhanced ability to disrupt the enemies command, control, communications, and intelligence capability.**
- **The importance of initiative, and the avoidance of frontal engagements with large U.S. naval surface warfare elements.**
- **Means to mitigate the vulnerability of even small naval units to air and missile attack.**

# IRGC Naval Branch Updates

- **June 22, 2010**
  - According to the Commander of the IRGC Naval Forces, Ali Fadavi, “The trend of equipment, modernization, and change in the IRGC will continue at a higher speed until the specified goals are attained”
- **June 24, 2010**
  - Fadavi stated, in response to the US’ presence in the Persian Gulf, “This force is mighty and capable of reacting very especially and very appropriately to inspection against Iranian ships”
  - Regarding the current strength of IRGC’s Naval Forces, “...right now we are equipped with hundreds of missile launcher ships among our thousands of warships, and the Americans are quite unfamiliar with the capabilities of the IRGC Naval Forces” -- Fadavi
- **July 19, 2010**
  - General Vahidi stated that “new domestically made submarines would be delivered to Iran’s Navy by July 27, 2010”
  - He further stated that these submarines would be highly equipped with modern equipments, and would improve the Navy’s maneuvering capabilities
- **July 25, 2010**
  - According to Iranian reporting, a senior Iranian military figure stated that “each hostile US warship located in the Persian Gulf will be swarmed by over 100 Iranian military vessels”
  - Rear Admiral Morteza Saffari stated that the US warships located in the Persian Gulf are “easy targets” and Iran is “able to inflict heavy losses on these ships”
  - The IRGC has stated that its missiles can hit any target across the Persian Gulf and all gunboats are within its range.

# IRGC Naval Branch Updates

- **August 10, 2010:**
  - **Bandar-e Abbas Vision of the Islamic Republic of Iran Hormozgan Provincial TV says Iran has Added Four Domestically-Made Ghadir Submarines to Naval Fleet.**
  - **Correspondent Ezdeha'i, identified by onscreen caption as Islamic Republic of Iran Broadcasting reporter] says, "With the launch of these four submarines, alongside the manufacturing of varieties of missile-launching vessels which has previously been accomplished, the chain of our country's defensive naval production has been completed today."**
  - **Defense Minister Ahmad Vahidi says. " These submarines, which were completely domestically made by experts in the defense industry and with the cooperation, understanding, and consultation of our dear ones in the Naval Force of the Islamic Republic Army, possess special features. Their ability to be agile and move and maneuver quickly, with long-range underwater navigation and the power to identify and track targets under water and at the surface, in addition to their possessing of proper equipment, precise sonar, precise torpedo systems, and automatic navigation systems, give [these submarines] very good capabilities."**
  - **Rear Admiral Habibollah Sayyari, says, "We believe that by using the submarines that exist in this country, and by employing the appropriate tactics, we are now able to have an underwater presence wherever it is necessary.**
  - **Correspondent, speaking over video of the submarines, says, The Ghadir 948 submarine possesses the most advanced navigation and weapons systems. The subsurface vessels are made in small, medium, and large, and Iran has rendered the mass production of small and medium submarines completely domestically. Out of the nearly 3,000 kilometers of maritime borders, about 2,200 kilometers are in the south of the country. The joining of these subsurface vessels with the Army's fleet plays an important role in the protection of our maritime borders. ...They have been designed for various waters. The small submarines were made for shallow waters, and the medium and large submarines for deep waters.**

## **IRGC Naval Branch Facilities**

- **The IRGC has numerous staging areas in such places and has organized its Basij militia among the local inhabitants to undertake support operations.**
- **The naval branch has bases and contingency facilities in the Gulf, many near key shipping channels and some near the Strait of Hormuz.**
  - **These include facilities at Al-Farsiya, Halul (an oil platform), Sirri, Abu Musa, Bandaer-e Abbas, Khorramshahr, and Larak.**
- **Iran recently started constructing new naval bases along the coasts of the Gulf and the Sea of Oman for an “impenetrable line of defense.”**
- **On October 27, 2008, Iran opened a new naval base at Jask, located at the southern mouth of the Strait of Hormuz, a strategic chokepoint for Persian Gulf oil.**

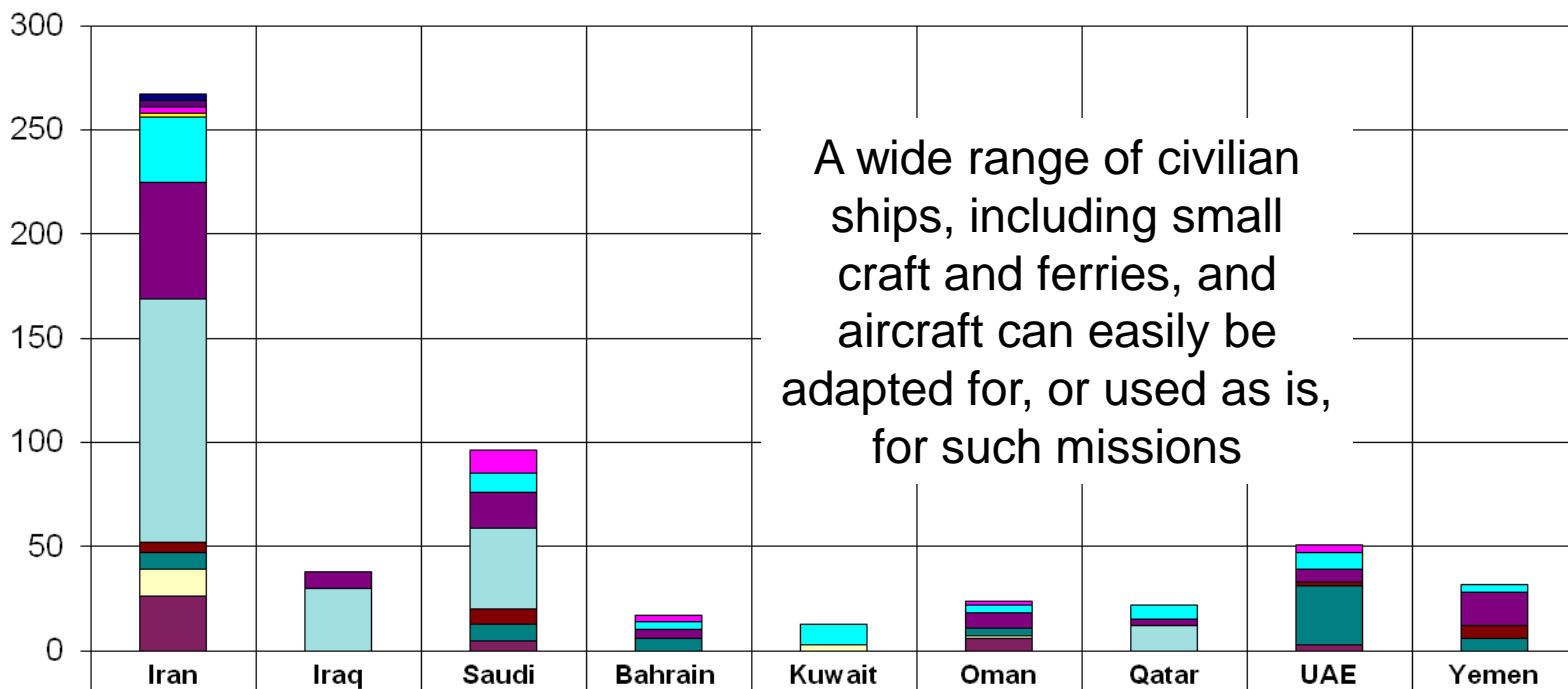
## Iranian Asymmetric Naval Warfare Forces -I

- Iran has an 18,000 man Navy and 12,000-15,000 man Naval Guards The Navy is in charge of operations in the Caspian and the Gulf of Oman. The Naval branch is in charge of operations in the Gulf, which is the focus of Iran's naval and amphibious capabilities for irregular warfare.
- Both lack modern surface vessel combat capability and are dependent on four obsolete frigates and three obsolete corvettes from the time of the Shah with limited modernization and uncertain combat readiness.
- Iran seems to be building its own prototype Mowaj-class corvette/destroyer, but it is not yet operational.
- The IN has three Russian Kilo-class submarines – which some reports indicate can lay smart mines and fire long-range, homing torpedoes – and the IRGC has at least 7 North Korean/Iranian-made Yono and Nahand-class midget submarines and semi-submersible small craft,
- The IN has a naval aviation branch with 3 aging P-3F maritime patrol and airborne command and control aircraft, three Falcon aircraft modified for electronic warfare and intelligence, and anti-submarine and mine warfare helicopters.
- There are some 3,000-5,000 Marines.

## Iranian Asymmetric Naval Warfare Forces -II

- The IRGCN has a wide range of mine warfare and smaller, more modern missile patrol boats armed with Chinese and Iranian-made anti-ship missiles.
- Its anti-ship missile vessels include 13 Kaman-class and 38-meter Thondor (Hudong)-class vessels with C-802 anti-ship missiles, and 9 C-14 and 10 Mk-13 smaller patrol boats with short range Chinese anti-ship missiles. Iran has made and deployed at least 25 Peykapp II-class missile boats and 15 of its own Peykaap I-class coastal patrol craft.
- The IRGCN has some 100 other, smaller patrol boats, many of which are smaller enough to be difficult to detect reliably by radar. A number of Iran's patrol boats are armed with torpedoes and short range or manportable anti-air missiles
- The IRGCN has land-based anti-ship missile batteries, including HY-2s with ranges approximately 100 kilometers and that can be direct to a target by an aircraft or unmanned aerial vehicle. (China has anti-ship missiles with 200-280 kilometer ranges, but it is not believed these have been sold to Iran.) US experts note that Iran can attack targeted ships with C-701, C-801, C-802 and Iranian-made anti-ship cruise missiles from its own shores, islands, and oil platforms using relatively small mobile launchers.
- The IN and IRGN have extensive mine warfare capabilities described later in this analysis.
- IRGC naval forces can operate from bases along the entire Iranian coast of the Gulf, from Islands and bases near the shipping channels through the Strait of Hormuz, and in the Gulf of Oman. The Navy and IRGC cannot "close the Gulf" for an extended period, but could present a peak threat that severely restricted shipping through the Gulf for some 5-10 to 10 days.

# Gulf Forces: Key Ships for Asymmetric Warfare



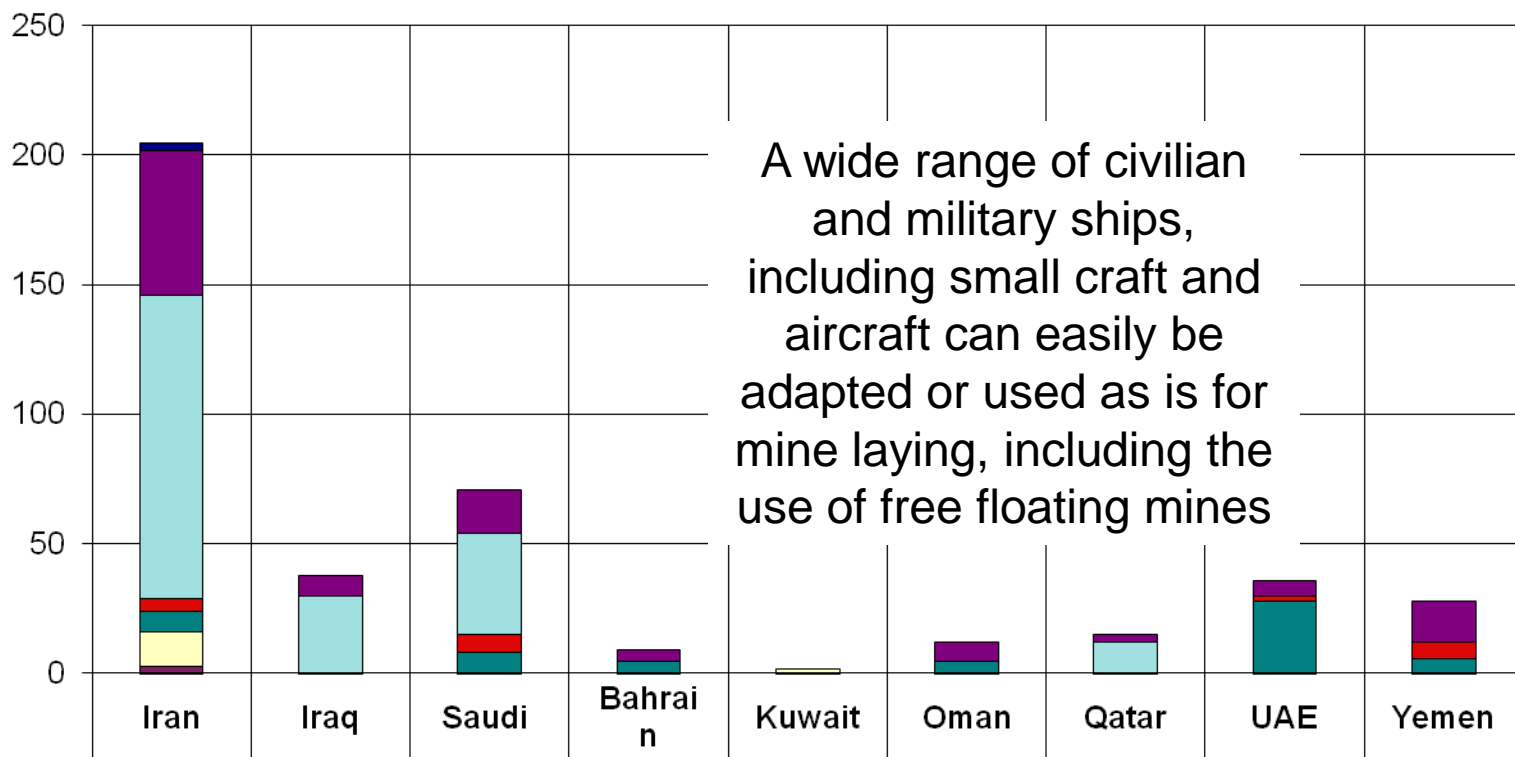
	Iran	Iraq	Saudi	Bahrain	Kuwait	Oman	Qatar	UAE	Yemen
Submarines	3								
Midget Submarines	3								
Major Missile Combat	3		11	3		2		4	
Major Other Combat	2								
Missile Patrol	31		9	4	10	4	7	8	4
Other Patrol	56	8	17	4		7	3	6	16
Armed Boats	117	30	39				11		
Mine	5		7					2	6
Landing Craft	8		8	5		4		28	5
Amphibious Ships	13				2	1	1		1
Support	26		5	1	1	6		3	



# Iranian Mine Warfare Capability

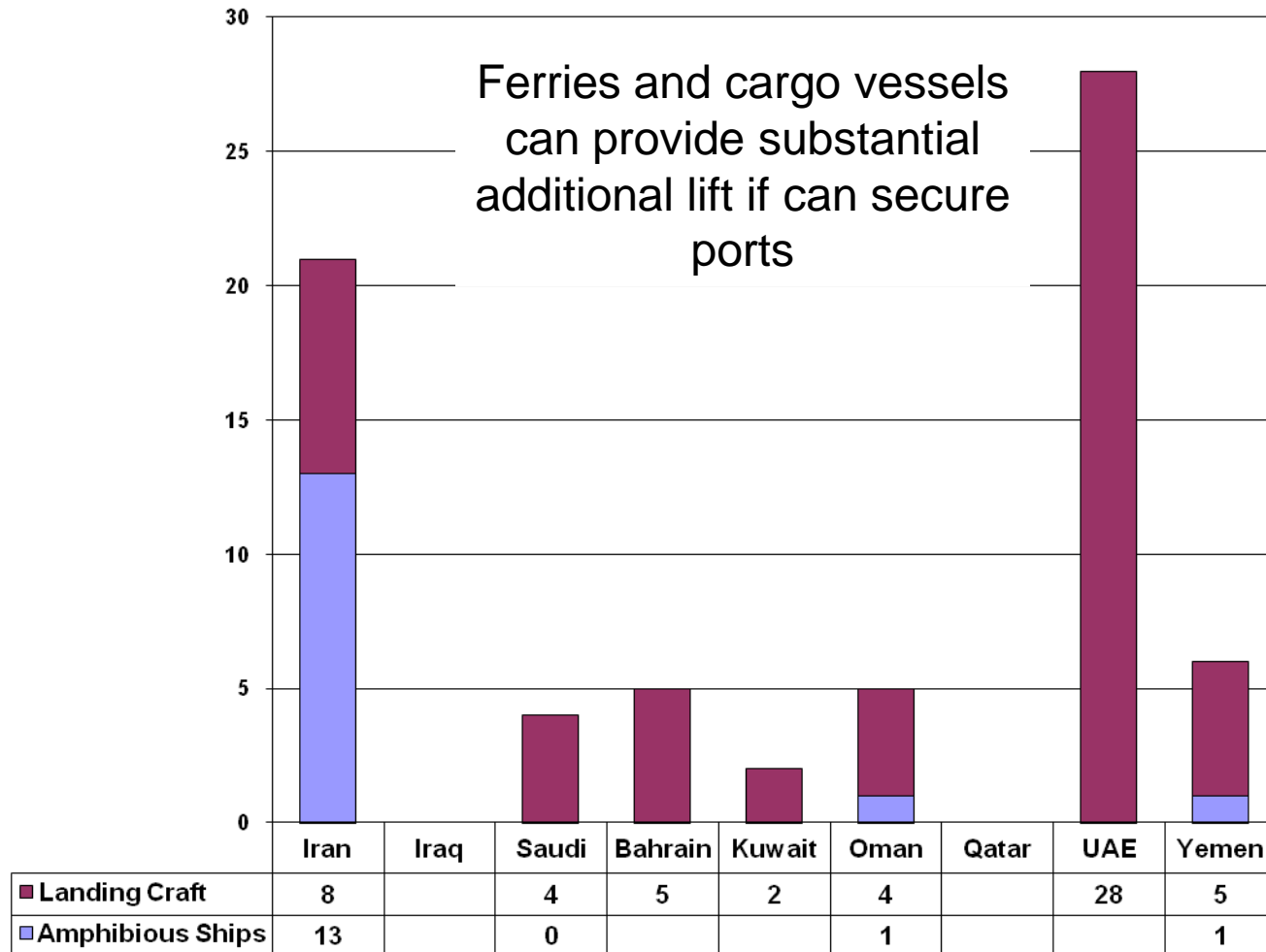
- **The Iranian Navy and IRGC regularly exercise minelaying. The Navy can use its submarines and has 5 aging mine warfare ships, but all IRGC patrol vessels can lay mines and Iran could use most commercial vessels.**
- **US Navy intelligence experts estimates that Iran has the Chinese EM52, a rocket-propelled anti-ship mine, and that the Iranian purchase of three Russian KILO-class submarines probably included modern magnetic, acoustic, and pressure-sensitive mines.**
- **Iran also produces its own mines, although these may still be limited to less advanced designs. US experts estimate that Iran had at least 2,000 mines by 2004. Now may be in excess of 4,000.**
- **This is a key threat. The US normally deploys only very limited mine warfare capabilities in, and Gulf naval capabilities consists of a total of only 5 Saudi mine layers and some helicopters with uncertain readiness and training .**

# Gulf: Dedicated and Potential Mine Warfare Forces



	Iran	Iraq	Saudi	Bahrain	Kuwait	Oman	Qatar	UAE	Yemen
■ Submarines	3								
■ Other Patrol	56	8	17	4		7	3	6	16
■ Armed Boats	117	30	39				11		
■ Mine	5		7					2	6
■ Landing Craft	8		8	5		4		28	5
■ Amphibious Ships	13				2	1	1		1
■ RH-53D Helicopters	3								

# Amphibious Ships & Landing Craft



Source: Adapted by Anthony H. Cordesman from IISS, *The Military Balance*, various editions, Jane's Sentinel series, and material provided by US and Saudi experts. Estimates differ on Saudi landing craft, because of different ways to count operational status. Some experts put the figure at 6 LCMs and 2 LCUs.

## Iranian Military Exercises: 2006-2010 - I

**January 27, 2006:** Iran completes major military exercise that tests Teheran's ability to attack Gulf shipping and Arab oil facilities. Sources said the exercise was designed to test capabilities to strike U.S. and Arab targets throughout the area of the Gulf. According to a diplomatic source, the exercise was meant to show the West that Iran could stop all oil shipments in the Gulf and destroy numerous oil facilities in Gulf Arab countries," and included a range of fighter-jets and helicopters from the Iranian Air Force, with the Iranian navy contributed surface vessels and submarines.

**August 19, 2006:** Iran launches a series of large-scale military exercises aimed at introducing the country's new defensive doctrine, state-run television reported. The television report said the military exercise would occur in 14 of the country's 30 provinces and could last as long as five weeks. The first stage of the maneuvers began with air strikes in the southeastern province of Sistan va Baluchistan,. The military exercise, is said to involve 12 infantry regiments, and is called "The Blow of Zolfaghar," in reference to a sword that belonged to Imam Ali, one of the most revered figures for Shi'ite Muslims.

**November 3, 2006:** Iran's Revolutionary Guards began another series exercises on days after a United States-led naval exercise began in the Gulf. Iran began the 10 days of maneuvers in the Gulf by test firing dozens of missiles, including the long-range Shahab-3 (estimated range: 2000 km or 1,240 miles), and the Shahab-2, which Iran says can carry a cluster warhead that can deliver 1,400 bomblets at once. Major General Yahya Rahim Safavi, leader of the Revolutionary Guards, says on television that Iran's military exercises were not meant to threaten neighboring countries. "We want to show our deterrent and defensive power to trans-regional enemies, and we hope they will understand the message of the maneuvers," he said. "The first and main goal is to demonstrate the power and national determination to defend the country against possible threat." General Safavi said the exercises would last 10 days and would take place in the Gulf, the Gulf of Oman and several Iranian provinces.

## Iranian Military Exercises: 2006-2010- II

**March 23-30 2007:** Iran's regular Navy launches week-long war-games on its southern shores. The military exercises are being carried out in the Gulf by Iran's regular Navy, the report said, adding that they would continue until March 30.

**January 7, 2008:** US ships harassed by Iran. Iranian boats approach three U.S. Navy ships in the strategic Strait of Hormuz, threatening to explode the American vessels. U.S. forces are reported to be on the verge of firing on the Iranian boats, when the boats - believed to be from the Iranian Revolutionary Guard's navy - turn and move away. A Pentagon official say. "It is the most serious provocation of this sort that we've seen yet," He says the incident occurs at about 5 a.m. local time Sunday as Navy cruiser USS Port Royal, destroyer USS Hopper and frigate USS Ingraham were on their way into the Gulf and passing through the strait - a major oil shipping route. to take evasive maneuvers. There were no injuries but the official said there could have been, because the Iranian boats turned away "literally at the very moment that U.S. forces were preparing to open fire" in self defense.

**July 7, 2008:** Iran's elite Islamic Revolutionary Guards Corps launch large-scale, five-day war-games, dubbed "Exercise Stake Net", was carried out in the Straits of Hormuz and the Sea of Oman, where an assortment of new weapons were brought into play. The Iranian military maneuvers take place on the same day the United States announces it too will holding naval exercises in the Gulf.

Iranian state media say that the military maneuvers by the IRGC's Navy and Air Force missiles unit are aimed at improving the force's military abilities. Separately, Brigadier General Mahmoud Chaharbaghi, commander of the IRGC Ground Forces artillery and missiles unit, announces that 50 of his unit's brigades are being armed with smart weapons and cluster bombs. Iran later test-fires nine missiles including what is claims is an upgraded version of Shahab-3 ballistic missile with a one-ton warhead capable of destroying targets within a 2,000-kilometer (1,245-mile) range.

## Iranian Military Exercises: 2006-2010 - III

**September 7, 2008:** Iran's armed forces test the country's new weapons systems and defense plans in a three-day military maneuver. Iran's naval forces claim to have made a breakthrough in building various types of "radar evading" submarines to guard its territorial waters. The IRGC says it successfully test-fired advanced shore-to-sea, surface-to-surface and sea-to-air missiles. The Islamic Revolution Guards Corp (IRGC) and the Army take part in drills involving anti-aircraft defense systems. The main purpose of the maneuvers is to maintain and promote the combat readiness of relevant units and to test new weapons and defense plans. Iran's Chief Navy Commander, Rear Admiral Habibollah Sayyari, said Iran is upgrading its naval fleet with a new generation of domestically-built submarines.

**September 15, 2008:** The Islamic Republic Air Force tests Iran's domestic-made warfare in a joint military exercise with the IRGC, the Defense Ministry says. The joint aerial maneuver is aimed at boosting Iran's defensive capabilities and operational tactics, Iran's Defense Minister Brigadier General Mostafa Mohammad-Najjar said. The military exercise, which involves The Islamic Republic of Iran Air Force (IRIAF) and the Islamic Revolution Guards Corps (IRGC), comes in the wake of escalating US and Israeli threats to strike the country's nuclear facilities.

**October 10, 2008:** Islamist militiamen affiliated to Iran's Islamic Revolutionary Guards Corps (IRGC) stage military exercises in the suburbs of Tehran on Friday to defend the Iranian capital against "natural disasters" and "enemy assaults". Members of the paramilitary Basij take part in military drills under the command of the Tharallah Garrison in Tehran. Similar war games are held in Karaj, Islamshahr, Shahre Rey, Rabat Karim, and Varamin, said the acting deputy commandant of the IRGC, Brigadier General Mohammad Hejazi, who also commands the Tharallah Garrison. The maneuvers last for 48 hours. Meanwhile another senior Basij leader announces that the paramilitary force is giving specialized training" to its units across Iran. "These units are receiving specialized air, sea and ground training to be prepared for defending the country, the ruling establishment, and the revolution", said Brigadier General Ahmad Zolqadr on the sidelines of a military parade in Zanjan, north-west Iran. Zolqadr is the operational commander of the Basij.

## Iranian Military Exercises: 2006-2010 - IV

**November 12, 2008:** Iran launches a “new” type of long-range ballistic missile dubbed "Sajjil," but its general layout was indistinguishable from the description of the "Ashura," which was flight-tested about one year ago.

**December 2-7, 2008:** Iran announces recent upgrades to the Naval Base in Asalouyeh and the now online base facilities in the port of Jask. Iranian officers state that long range tactical missile silos and shore based anti-ship missiles have long been key aspects of planning of potential military operations in the event of an open conflict. Top Iranian Army commander Major General Ayatollah Saleh is quoted in *Presstv Nov 30* as saying "the heavy weight of the enemy warships provides the Iranian side with an ideal opportunity for launching successful counter-attacks" Iran announces that it is in the final stages of planning an extensive naval and military exercise 'Unity 87' due to commence in December 2008. Iran says it will seek to accomplish objectives that include defense against a Israeli and US threat, closing the Strait of Hormuz to local and international shipping, and the testing new and improved military equipment and tactics.

Admiral Qasem Rostamabadi tells states radio that "The aim of this maneuver is to increase the level of readiness of Iran's naval forces and also to test and to use domestically-made naval weaponry." He says the naval maneuvers cover an area of 50,000 square miles, including the Sea of Oman off Iran's southern coast. "In this six-day long maneuver there will be more than 60 combat vessel units," Kayhan quotes Admiral Habibollah Sayyari, commander of the navy as saying it will include destroyers, missile-equipped battleships, submarines, special-operations teams, helicopters, and fighter planes. Iran has previously claimed it could close the Strait of Hormuz to shipping, through which about 40 percent of the world's globally traded oil passes. The United States has pledged to protect shipping routes. An Iranian naval commander says a week earlier that the country's navy could strike an enemy well beyond its shores and as far away as Bab al-Mandab, the southern entrance to the Red Sea that leads to the Suez Canal. Iran test-fires a new surface-to-surface missile from a warship in a strategic shipping route, as part of the war games in the Sea of Oman and the Gulf region: State radio reports, "The surface-to-surface Nasr-2 missile was tested in the (Sea of) Oman operational region,". IRNA reports that, "The Nasr-2 was fired from a warship and hit its target at a distance of 30 km (19 miles) and destroyed it," adding it was the first test of the new, medium-range missile.

## Iranian Military Exercises: 2006-2010 - V

**Mach 8, 2009:** Iranian officials reported "successfully" testing a new air-to-sea missile with a range of 110 kilometers (68 miles), the Fars news agency reported. It did not say when the test was conducted. "Iranian defense specialists are able to successfully install missiles with a range of 110 kilometers on fighter planes and launch them," the report said, adding that the high-precision weapon weighs about 500 kilos. The report said the latest test showed the Islamic republic's "ability to automatically direct the missile and carry warheads to destroy large targets at sea."

**May 20, 2009:** Iran test-fired a solid-fuel missile capable of reaching Israel or US bases in the Middle East. Iranian officials claim that the two-stage, solid-fuel Sajjil-2 surface-to-surface missile has a range of approximately 2,000km (1,240 miles). Iranian Defense Minister Mostafa Mohammad Najjar, claimed that in addition to the increase in range, the Sajjil-2 differs from the Sajjil missile launched in Novmeber 2008, because it "is equipped with a new navigation system as well as precise and sophisticated sensors," according to Iran's official news agency, and added that the missile landed "precisely on the target."

Reports also indicate that the Sajjil-2's reaction times may be about 50-20 minutes faster than the Shahab series that came before it. Its solid fuel booster may also be is also reliable, particularly in a mobile basing; and haves less need for maintenance. Its mobility launcher might also be harder to detect since the TEL requires fewer support vehicles -- although the Shahab does use storable liquid fuels and the difference is might not be a serious as some sources indicate.

**May 26, 2009:** Iran sent six warships into international waters including the Gulf of Aden, a local newspaper reported, just days after it test-fired its Sajjil -2 missile. "We have dispatched six warships to international waters and the Gulf of Aden," naval commander Habibollah Sayari was quoted as saying in the Jomhuri Eslami. "This mission shows our increased capability in dealing with any foreign threat," he said. Iranian officials said on May 14 that the Islamic republic had dispatched two warships to the Gulf of Aden but it was unclear whether they were among the six announced by Sayari.



## Iranian Military Exercises: 2006-2010 - VI

**June 1, 2009:** The Iranian air force has launched a large military exercise dubbed "Thunder 88" over its regional waters, official media indicated. Iranian TV said the Air Force carried out maneuvers using various types of combat aircraft, a move that coincided with the Defense Ministry's launching of three new Ghadir-class submarines for its naval fleet (bringing the total number of the sonar-evading vessels to seven) and 18 speedboats at the port of Bandar Abbas near the Straits of Hormuz, the Kuwait news agency KUNA reported. Officials said the exercises are meant to enhance the Iranian Air Force's capabilities and to train them to safeguard navy ships. Iran's Mehr news agency said the Bandar Abbas ceremony was attended by Army Commander Ataollah Salehi and Defense Minister Mostafa-Mohammad Najjar, KUNA reported.

The Ghadir class is a smaller vessel with a displacement of around 120 tons. The semiofficial Fars News Agency in 2007 said the Ghadir class was equipped with stealth technology. The news comes amid a flurry of Iranian defense activity. Iran in May inaugurated a production line for a military hovercraft, dubbed the Younes 6. Meanwhile, Iran announced the military production of some 20 other military devices, including laser systems and electronic warfare devices. Production also began on a 40mm anti-cruise cannon dubbed Fath, which is capable of reaching targets as far as 7 miles away with a firing rate of 300 rounds per minute. The Sejjil-2 surface-to-surface solid-fuel missile, meanwhile, was launched in May with a range capable of reaching Israel.

**June 6, 2009:** Iran has started production of a new ground-to-air missile system, Iranian media, amid persistent speculation that Israel might attack the Islamic Republic's nuclear facilities. "The range of this defense system (missile) is more than 40 km and it is able to pursue and hit the enemy's airplanes and helicopters on a smart basis and at supersonic speed," Defence Minister Mostafa Mohammad Najjar said, without specifying how the missile compared to previous such weapons.

**June 22, 2009:** Iran began three days of air force exercises on in the Gulf and the Sea of Oman to raise operational and support capability, Iranian media said. "Long-distance flights of around 3,600 km (2,237 miles) along with aerial refueling from tanker to fighter jet and from fighter jet to fighter jet will be part of this exercise," state broadcaster IRIB's website reported. "Low altitude flights over the waters of the ... Gulf and the Sea of Oman by Iranian fighter jets over distances of 700 km will also be tested.," it said. IRIB reported that the exercises were also aimed at raising the force's ability to use intelligence aircraft "to send signals and analyze threats".

## Iranian Military Exercises: 2009-2010 - VII

**September 28, 2009:** Iran launched a long range missile claiming that it was capable of hitting Israel along with firing multiple short range missiles during its wargame code named ‘Fatemeh Zahra (SA). Iranian media reported that “all the fired missiles hit the pre-determined objectives... Tens of ground-to-ground missiles were also fired during the military exercise which was conducted in line with the carrying out of preventive programs of the Islamic Republic of Iran’s Armed Forces” IRGC General Hossein Salami had reported that among the various kinds of missiles launched were the medium range Shahab-1 and -2 missiles as well as the long range Shahab-3 missile. Other short range missiles such as the Fateh, Tondar and Zelzal were successfully test fired as reported by the Iranian media. Further media reporting states, “Tens of ground-to-ground missiles were also fired during the military exercise which was conducted in line with the carrying out of preventive programs of the Islamic Republic of Iran’s Armed Forces”

**November 22, 2009:** Iranian media reporting shows, air forces of the IRGC launched the first phase of a nationwide areial wargame code named “Defenders of Velayat 2”. Brigadier General Ahmad Mighani stated that “the aim of the war game is to [increase] coordination and enhance combat readiness of the Iranian Air Force, IRGC and the Basij (volunteer) forces.” It was conducted throughout Iran in cities such as Bushehr, Fars, Yazd, Isfahan, Markazi and Gazvin provinces as well as in the northern and western parts of the country. The general also stated, “The maneuver has three phases including preparation of military units, reconnaissance flights and dog fights...will be held in an area about 600,000 square kilometers during which some of the most sophisticated defense systems will be examined.”

**April 22<sup>nd</sup>, 2010:** Iranian reporting stated that the IRGC engaged in a 4 day war game named “Holy Prophet 5” in the Persian Gulf and the Strait of Hormuz. During the exercise, the IRGC demonstrated successful tests of 5 advanced cruz shore-to-shore missiles and sea-to-sea missiles. The missiles specifically tested were :Nasr (victory), Saeqeh (lightning), and Noor (light). In addition, according to further Iranian reporting, the IRGC tested “lazer smart weapons” and “hit their targets with 100% accuracy”. The IRGC claimed this “Drill carried message of peace and security...and also served as a warning to the US and Zionist Regime.”

## Iranian Military Exercises: 2009-2010 - VIII

**May 7- 12, 2010:** The IRGC conducted a 5 day war game entitled “Velayat 89” in the Persian Gulf, Sea of Oman, and the Northern Indian Ocean – covering an area of 250,000 square km. According to Iranian reporting, “an Iranian spokesperson said that the Velayat 89 wargame has been conducted mainly to showcase Islamic Iran’s strength in controlling general passing ways hundreds of kilometers far away Hormuz Strait and facilitate connection of ships coming from Hormuz Strait to Persian Gulf.” Rear Admiral Qassem Rostambadi told the IRNA that “the chemical invasion of the hypothetical enemy was successfully countered with the use of domestically-made warfare during this military exercise. The war games use combat, support, logistic, radar and electronic units as well as surface-to-surface, under water and air missiles using the fighter aircraft of the air force.” Further Iranian media reporting stated that the “IRA’s Navy successfully launched electronic and anti-electronic warfares, using distracters and alarm signalers, information collectors operating through radar system, and audio and non-audio instruments in the Oman Sea onshore and offshores.” Iran’s newly deployed warship ‘Jamaran’ has also reportedly been used in the naval exercise. The sea vessel has a displacement of around 1,400 tons and is equipped with modern radars and electronic warfare, as per the media report.

Operations Deputy for Iranian Army’s Ground Forces, Brigadier General Ali Arasteh told reporters on Sunday that in the fifth day of the war games, numerous sectors of the ground forces including infantry, armoured, artillery and telecommunications units started their tactical operations in southern parts of the province which is located in southeast of the country. The IRNA reported various types of surface-to-surface, air-to-surface and surface-to-sea missiles were fired at the fourth phase. While in the fifth phase Iranian waters were characterized by firing solid propellant Farg-5 cruise missiles towards the hypothetical targets . The mid-range intelligent missile is designed to trace and completely destroy its targets according to Iranian media. Further reporting shows that it was fired from shore to open seas in the northern Indian Ocean, flying up to a 50 to 60-km distance, the radar-evading missile is more advanced than its foreign counterparts, and can be installed on vessels such as warships and hovercraft.

## **IRGC Commander on Mass Graves**

**The deputy commander of the Revolutionary Guard, Gen. Hossein Kan'ani Moghadam, said graves for any attacking U.S. troops have been dug in Iran's southwestern Khuzestan province, where Iran buried Iraqi soldiers killed during the ruinous 1980-88 war between the Islamic republic and Iraqi leader Saddam Hussein's regime.**

**General Moghadam stated, "The mass graves that used to be for burying Saddam's soldiers have now been prepared again for U.S. soldiers, and this is the reason for digging this big number of graves."**

**Moghadam further stated, "I assume that the enemy will be hit in its own military bases out of our borders and will not have any chance to have its forces land in Iran".**

**"If the U.S. decides to take a pre-emptive action and attack Iran, Iran will have no choice but to strike the American bases in the region," he said. "The heavy costs of such a war will not be just on the Islamic Republic of Iran. America and other countries should accept that this would be the start of an extensive war in the region."**

## **The Al Quds Force - I**

- **Comprised of 5,000 - 15,000 members of the IRGC (Increased size of force in 2007)**
- **Equivalent of one Special Forces division, plus additional smaller units**
- **Special priority in terms of training and equipment**
- **Plays a major role in giving Iran the ability to conduct unconventional warfare overseas using various foreign movements as proxies**
- **Specialize in unconventional warfare mission**
- **Control many of Iran's training camps for unconventional warfare, extremists, and terrorists**
- **Has offices or "sections" in many Iranian embassies throughout the world**
- **Through its Quds Force, Iran provides aid to Palestinian terrorist groups such as Hamas, Lebanese Hizballah, Iraq-based militants, and Taliban fighters in Afghanistan.**
- **Despite its pledge to support the stabilization of Iraq, Iranian authorities continued to provide lethal support, including weapons, training, funding, and guidance through its Quds Force.**
- **General David H. Petraeus has stressed the growing role of the Quds force and IRGC in statements and testimony to Congress.**

## The Al Quds Force - II

- **Quds Force continue to provide Iraqi and Afghani militants with:**
  - **specialized training,**
  - **funding,**
  - **Iranian-produced advanced rockets,**
  - **sniper rifles,**
  - **automatic weapons,**
  - **mortars,**
  - **Improvised Explosive Devices (IEDs)**
  - **and explosively formed projectiles (EFPs) that have a higher lethality rate than other types of IEDs**
- **Since 2006, Iran has arranged a number of shipments of small arms and associated ammunition, rocket propelled grenades, mortar rounds, 107mm rockets, and plastic explosives, possibly including man-portable air defense systems (MANPADs), to the Taliban.**
- **Israeli defense experts continue to state that they believe the IRGC and Quds force not only played a major role in training and equipping Hezbollah, but may have assisted it during the Israeli-Hezbollah War in 2006, and played a major role in the Hezbollah anti-ship missile attack on an Israeli Navy Sa'ar-class missile patrol boat.**

## Iran and Hezbollah - I

- Hezbollah was originally formed in 1982 by Iranian seminarians.
- Iran's aid packages (arms and money) to Hezbollah are said to exceed \$100 million per year.
- Iran has gone from supplying small arms, short-range missiles and training to providing more sophisticated long-range missiles and other higher-end weaponry
  - Iran exported thousands of 122-mm rockets and Fajr-4 and Fajr-5 long-range rockets to Hezbollah in Lebanon, including the Arash with a range of 21–29 kilometers.
  - Between 1992 and 2005, Hezbollah received approximately 11,500 missiles and rockets; 400 short- and medium-range pieces of artillery; and Aresh, Nuri, and Hadid rockets and transporters/launchers from Iran.
  - In 2005, Iran sent Hezbollah a shipment of large Uqab missiles with 333-millimeter warheads and an enormous supply of SA-7 and C-802 missiles, two of which were used in an attack on an Israeli ship.
- Iran also supplied Hezbollah with an unknown number of UAV's, the *Mirsad*, that Hezbollah briefly flew over the Israel-Lebanon border on November 7, 2004, and April 11, 2005; at least three were shot down by Israel during the summer 2006 war.
- Iran supplied Hezbollah advanced surface-to-air missiles, including Strela-2/2M, Strela-3, Igla-1E, and the Mithaq-1. The same missiles were reported to have been used to target Israeli helicopters.

## Iran and Hezbollah - II

- **During Hezbollah's summer 2006 war with Israel, Iran resupplied the group's depleted weapons stocks.**
- **Hezbollah has recovered from its 2006 confrontation with Israel and has been able to rearm and regroup, and Iran has been an important part of that recovery.**
  - **Various Types of Rockets, reportedly increasing its stockpile to 27,000 rockets, more than double what Hezbollah had at the start of the 2006 war. (some say 40,000)**
  - **Among the deliveries were 500 Iranian-made "Zelzal" (Earthquake) missiles with a range of 186 miles, enough to reach Tel Aviv from south Lebanon.**
  - **Reports of Scud transfer unconfirmed.**
  - **Much better C4I/BM and sheltered positions now in middle of country.**
- **Fighting in Lebanon in 2006 seems to have increased Hezbollah's dependence on Iran and Syria. Both Hezbollah's loss of weapons and fighters in the conflict with Israel and the resulting damage to its reputation and position within Lebanon made it more reliant upon outside supply.**
- **Iran seems to directly control some small Hezbollah cells outside Lebanon.**
- **Elements of Hezbollah planned attacks in Egyptian Sinai; operate in Iraq.**

Source Multiple news outlets and Congressional reports and Intelligence assessments including: "Israel's Peres Says Iran Arming Hizbollah." Reuters, February 4, 2002; Kenneth Katzman, Iran: U.S. Concerns and Policy Responses, Congressional Research Service Report for Congress RL32048, April 14, 2009, available at: <http://www.fas.org/sgp/crs/mideast/RL32048.pdf>; Robin Hughes, "Iran Answers Hizbollah Call for SAM Systems," Jane's Defence Weekly, August 7, 2006, available at: [www.janes.com/defence/news/jdw/jdw060807\\_1\\_n.shtml](http://www.janes.com/defence/news/jdw/jdw060807_1_n.shtml); Rotella, Sebastian. "In Lebanon, Hezbollah Arms Stockpile Bigger, Deadlier." Los Angeles Times, May 4, 2008; Shadid, Anthony. "Armed With Iran's Millions, Fighters Turn to Rebuilding." Washington Post, August 16, 2006; MEMRI, "Iran and the Recent Escalation on Israel's Borders Reaction in Iran, Lebanon, and Syria," Special Dispatch Series no. 1207, July 17, 2006, available at: [www.memri.org/bin/articles.cgi?Page=archives&Area=sd&ID=SP120706](http://www.memri.org/bin/articles.cgi?Page=archives&Area=sd&ID=SP120706); Ali Nouri Zadeh, "130 Officers from the Iranian Revolutionary Guard Corps and Quds Force Aid Hezbollah: 11,500 Missiles and Rocket-Propelled Grenades Sent from Tehran to Hezbollah," Asharq Al-Awsat, July 16, 2006, available at: [www.aawsat.com/details.asp?section=4&issue=10092&article=373305&search=C802&state=true](http://www.aawsat.com/details.asp?section=4&issue=10092&article=373305&search=C802&state=true); "New Iranian capability is troublesome," The Washington Times, 19 February 2009; The Israel Project, "Hezbollah, Hamas Rearm as Israel Works to Resume Peace Process," press release, February 22, 2007, available at: [www.theisraelproject.org/site/apps/nl/content2.asp?c=hsJPK0PIJpH&b=689705&ct=3601455](http://www.theisraelproject.org/site/apps/nl/content2.asp?c=hsJPK0PIJpH&b=689705&ct=3601455), etc.



## Iran and Hamas/Islamic Jihad

- **Iran openly supported Hamas and spoke out against the lack of support for Hamas by Arab regimes throughout the Middle East during engagements between the IAF and Hamas in late 2008 and early 2009 in Gaza.**
- **Iran provided training, arms and logistical support to Hamas during the fighting in Gaza between Israeli forces and Hamas militants in late December 2008 and early January 2009.**
- **Continued to fund Islamic Jihad, over which it has more direct influence and control,**
- **Israeli intelligence sources continued to report Iranian efforts to rearm Hamas after a ceasefire agreement was reached in January 2009.**
- **Has equipped Hamas and Islamic Jihad with long range rockets that can be broken down in to four units for transfer through tunnels. They now have a larger and more modern inventory than in “Gaza War.”**
- **Islamic Jihad fired rockets into Eilat and Aqaba in August 2000.**
- **Arms transfers come through Sudan and Sinai. Tunnels are key route.**
- **Level of Iranian financial support uncertain.**

*Source Multiple news outlets and Congressional reports and Intelligence assessments including: Kenneth Katzman, Iran: U.S. Concerns and Policy Responses, Congressional Research Service Report for Congress RL32048, April 14, 2009, available at: <http://www.fas.org/sgp/crs/mideast/RL32048.pdf>; Alon Ben-David, “Iranian influence looms as fragile Gaza ceasefire holds,” Jane’s Defence Weekly, 22 January 2009; Mike Shuster, “Iranian Support For Hamas Running High Post-Gaza,” NPR, available at: 4 February 2009, available at: <http://www.npr.org/templates/rundowns/rundown.php?prgId=3>; The Israel Project, “Hezbollah, Hamas Rearm as Israel Works to Resume Peace Process,” press release, February 22, 2007, available at: [www.theisraelproject.org/site/apps/nl/content2.asp?c=hsJPK0PIJpH&b=689705&ct=3601455](http://www.theisraelproject.org/site/apps/nl/content2.asp?c=hsJPK0PIJpH&b=689705&ct=3601455); etc.*

## **Planning for Defense Against Asymmetric Warfare: Converting the GCC from a Facade to a Force**

- **Deterrence, passive defense, and conflict prevention areas critical as active defense.**
- **Need integrated GCC force planning and war planning efforts.**
- **Must show GCC will act together. Threats cannot divide or exploit weakest link.**
- **Exercise realistic “red-blue” war games to determine common options and requirements.**
- **Follow-up with realistic CPXs and FTXs.**
- **Emphasize joint warfare approaches that tie in paramilitary and security forces.**
- **Demonstrate have exercised a retaliatory capability.**
- **Interoperability with other Gulf states and with US, UK, France.**
- **Defend against strikes at critical nodes and infrastructure.**

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# Iran, the Gulf, and Strategic Competition: Missiles and Weapons of Mass Destruction

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2010*

## What Is The Threat?

- **Intimidation and Deterrence?**
- **Test, development, rolling future threat?**
- **Conventional Warhead, Uncertain Reliability, Poor CEP/Accuracy?**
- **Conventional Warhead, High accuracy, maneuvering capability?**
- **Chemical Warhead?**
- **Possible nuclear warhead?**
- **Tested Nuclear warhead?**
- **Ballistic + cruise threat?**
- **Volley or Limited Rate/numbers?**
- **Sheltered or mobile basing?**
- **Launch on warning (LOW), Launch under attack (LUA)?**

# *The Challenge of Missile Warfare*

# Iran's Ballistic Missiles: DNI Assessment - March 2010

**Iran has continued to develop its ballistic missile program, which it views as its primary deterrent. Iran is fielding increased numbers of short-and medium-range ballistic missiles (SRBMs, MRBMs) and we judge that producing more capable MRBMs remains one of its highest priorities. Iran's ballistic missile inventory is one of the largest in the Middle East.**

**In late November 2007, Iran's defense minister claimed Iran had developed a new 2,000 km-range missile called the Ashura. Iranian officials on 12 November 2008 claimed to have launched a two stage, solid propellant missile called the Sejil with a range of 2,000 km. In 2009, Iran conducted three flight tests of this missile.**

**As early as 2005, Iran stated its intentions to send its own satellites into orbit. As of January 2008, Tehran reportedly had allocated \$250 million to build and purchase satellites. Iran announced it would launch four more satellites by 2010 to improve land and mobile telephone communications.**

**Iran's President Ahmadi Nejad also announced Tehran would launch a home- produced satellite into orbit in 2008, and several Iranian news websites released photos of a new rocket called "Safi."**

**In mid-August 2008, Iran first launched its Safir space launch vehicle, carrying the Omid satellite. Iran claimed the launch a success; however US officials believed the vehicle did not successfully complete its mission. Iran successfully launched the Omid satellite aboard the Safir 2 SLV in early February 2009 according to press reports.**

**Assistance from entities in China and North Korea, as well as assistance from Russian entities at least in the past, has helped Iran move toward self-sufficiency in the production of ballistic missiles. Iran still remains dependent on foreign suppliers for some key missile components, however. Iran also has marketed for export at trade shows guidance components suitable for ballistic missiles.**

# Iranian Missile Threat

**Long-Range Ballistic Missiles**

- New Intermediate Range Ballistic Missile or Space Launch Vehicle (SLV) in development
- Likely to develop ICBM/SLV ... could have an ICBM capable of reaching the U.S. before 2015



Shahab 3/3A

Range (km)	Payload (kg)
1,350	1,158
1,400	987
1,500	760
1,540	650
1,560	590.27
1,580	557.33
1,600	550
1,780	240
2,000	-

ms-1096738 / 061437

(Source: Missile Defense Program Overview for the European Union, Committee on Foreign Affairs, Subcommittee on Security and Defense. Dr. Patricia Sanders. Executive Director. Missile Defense Agency)

# Iran's Ballistic Missiles - I

## Liquid Propellant Missiles

- Has approximately 200-300 Shahab-1 and -2 missiles capable of hitting targets in neighboring countries
- Imported/assembled between 12 and 18 Shahab-1&-2 TELs. This number is growing to 24+
- Iran can hitting targets up to 900km from its borders using the Shahab-3 and Ghadr-1
  - Ghadr-1 began flight tests in 2004 – theoretically extends Iran's reach to about 1600km, but seems to have a smaller warhead – 750kg
- Iran has at least six Shahab-3/Ghadr-1 Transporter-Erector-Launcher (TEL) vehicles, and probably more. Silo option may be in development.

## •Solid Propellant Missiles

- Sajjil-2 – potentially capable of delivering a 750kg warhead to a range of 2200km
- The only country to have developed this missile without first having nuclear weapons
  - Solid fuelled systems provide certain advantages
    - Less prone to pre-emptive attacks given shorter launch prep times
    - Successfully tested in November of 2008
    - Still AT LEAST 2 years away from being fully operational



## Iran's Ballistic Missiles - II

### • Impact

- **Estimated Casualties would still be low**
- **Iran must unleash its full missile arsenal and that the majority of the warheads penetrated missile defenses**
- **Due to the low accuracy of these warheads.**
- **The confident destruction of a fixed-point military would require a significant percentage at least of its missile inventory to complete a specific mission**
- **Currently able to conduct harassment attacks towards large airport bases however, nothing capable of shutting down military activities.**
- **Lacking high number of TELs and the delays occurring during reload procedures**

### • Potential exists for chemical and biological warheads

- **Missiles still however could not reliably carry out and deliver enough agent over a wide enough area to stop an adversary's military capabilities indefinitely**

### • Tehran's ballistic missiles are capable of loading nuclear warheads

- **Challenge is making a small enough bomb**
- **Most common delivery platforms would be Ghadr-1 and the Shahab-3**
- **Once the solid propellant Sajjil-2 becomes operational, this would be an option as well.**
  - **Offers greater flexibility and superior range-payload capacity**

## Iran's Ballistic Missiles - III

### •Ballistic Missile Industries

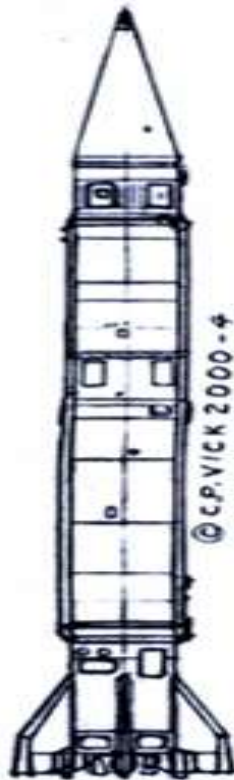
- Turning away from foreign aid/design, Iran redesigns of Shahab-3 resulted in longer-range Ghadr-1
- Continued efforts resulted in a modified Ghadr-1 which created the Safir space-launch vehicle – orbiting a small satellite in space.
- Unveiling of the two-stage Simorgh launch vehicle – comprised of 4 No-dong engines suggests that Iran plans to develop more powerful satellite carriers
- Iran has proven to have the capacity to successfully modify existing missiles and outfit them with the necessary components to become effective
- These efforts have strong political support given the financial services that have been allocated to the research and development efforts of these missiles
- However, this support still depends significantly on foreign aid, and availability and access to key materials

# Images of Iranian Missile Program

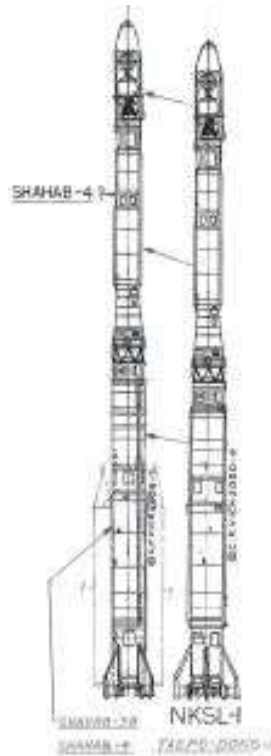
Shahab-3



No Dong



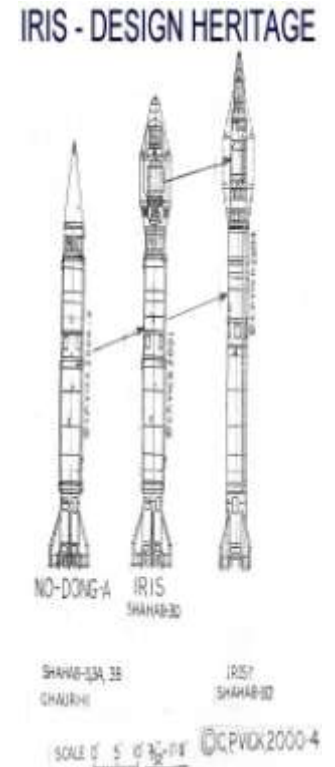
Shahab-4



Variant



IRIS



Range	1,300	1,300	2,000	2,000	3,000
Payload	~1,000	700-1000	?	700	~1,000
IOC	2002	?	?	?	2005

# Ballistic and Cruise Missile Updates

- **Dec 16, 2009**
  - Iranian reporting shows an upgraded version of the Sejil-2 missile test was successful.
  - Defense Minister General Ahmad Vahidi stated that “it is impossible to destroy [Sejil-2] by anti-missile rockets”
  - He also stated that the launch prep time necessary is shorter than previous versions, for this missile. While further referring to the upgraded missile as a “great development in Iran’s defense industry increasing the country’s technical and tactical powers”
- **Jan 10, 2010**
  - General Ahmad Vahidi stated “Iran’s missile deterrent power is highly above the enemies’ imagination”
- **March 7, 2010**
  - Iranian reporting shows that Iran has started production on the Nasr-1 cruise missile.
  - Minister of Defense, General Ahmad Vahidi reports that the Nasr-1 cruise missile is “capable of destroying 3,000 ton targets”
  - According to the minister, the Nasr-1, “the short-range surface-to-surface missile will be capable of being fired from the air and underwater in the near future”
- **June 19, 2010**
  - General Ahmad Vahidi reports that “Iran’s missile capability is of a deterrent nature and poses no threats to others”
  - In response to Sec. Gates’ statement: “Iran could, if it wanted, launch scores, even hundreds of missiles into Europe”

# “Guesstimated” Iranian Missile Ranges



# **Future Capabilities : Progress and Obstacles**

## **Liquid Propellant**

- **Some future advances will be governed by the fact that Iran will have to produce liquid propellant engines “in house”**
- **Fully functional Shahab-3 and Ghadr-1 require at least 3 to 5 years of prep and testing**
- **Performance analysis in the Shahab missiles compared to the Scuds previously acquired from the Soviet Union show a continued dependence on design and implementation with the Soviet framework.**
- **Speculation of foreign support in the form of technical assistance suggests that Iran may be able to establish a stand alone liquid-propellant engine production line of its own in the near future**

## **Solid Propellant**

- **Iran has established a series of licensed solid-propellant production lines**
- **2 years or more for a functional Solid- propellant rocket**
- **These facilities have demonstrated the ability to develop rocket motors to be used potentially on the Sajjil-2 missile**
- **However much of the Iranian knowledge in dealing with design and implementation of these solid-propellant missiles depends much on the technical aid of Chinese experts, Iran is still between 2 to 3 years away from developing a stand-alone program**

## **Guidance Systems**

- **While Iran still must import complete guidance units for its missiles, evidence indicates Iran has the knowhow to assemble basic units and modify them successfully to outfit custom missiles**
- **Minor improvements such as more robust GPS receivers to enhance accuracy**
- **Ability to incorporate Iranian created guidance packages (excluding actual units) improving inertial navigation units**
- **Provides short term advantages**
- **However, needs precise thrust terminations. Post Boost control systems**
- **Without these, Iranian missile accuracy will still fail to improve significantly**

# Future Capabilities : Potential Outcomes

**Iran still has to rely heavily on Foreign technical assistance (Russia and China) in developing Liquid-Propellant engines, and both of these countries are starting to adhere more closely to Missile Technology Control Regime guidelines. This will force Iran to rely more on its own technology and industrial base and/or less capable North Korean technology..**

**•As Iran seeks to develop missiles with a longer range, quicker set up and reaction times, and more reliability it will probably shift to solid fuel. It may develop and strengthen the Sajjil-2 or modify the Safir satellite launcher for military use. Iran has the ability, availability of resources, and expertise to implement this process.**

**•Implementing some TBM countermeasures seems likely.**

**•Effective cluster and CBW warheads are possible.**

**•Improved accuracy is uncertain without new technologies.**

**•Would require a far more intensive testing program to have credible reliability for longer range systems.**

**•Reports of terminal guidance capabilities seem doubtful through mid-term.**

**•Important caveats**

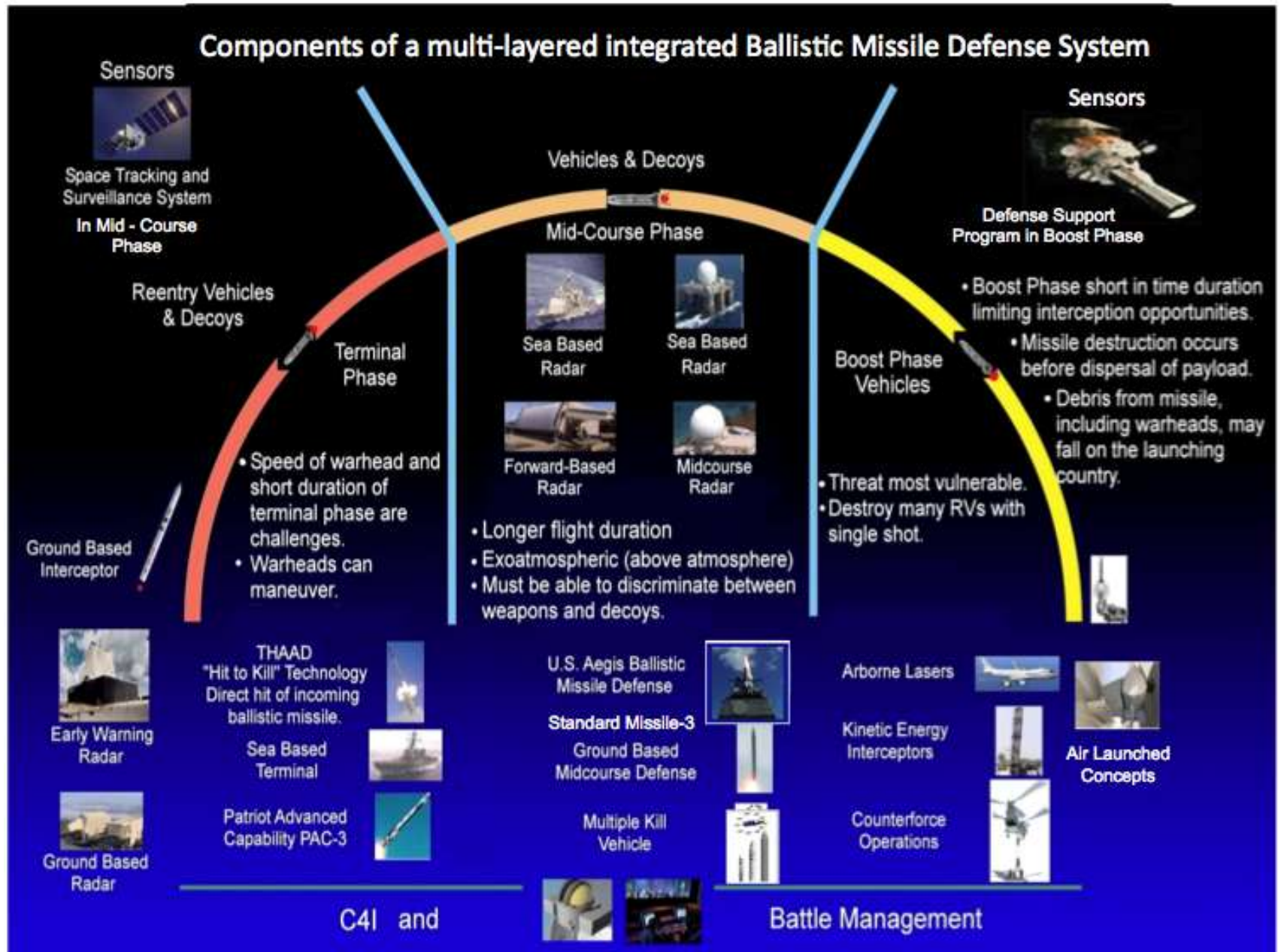
- Still necessary to engage in multiple testing phases**
- Acquisition of tracking and telemetry systems that can be deployed on sea-based platforms**
- Tehran would have to develop and implement reliable technologies for all forms of advanced warheads that could withstand shock and re-enter the atmosphere**

# A Gulf Missile War

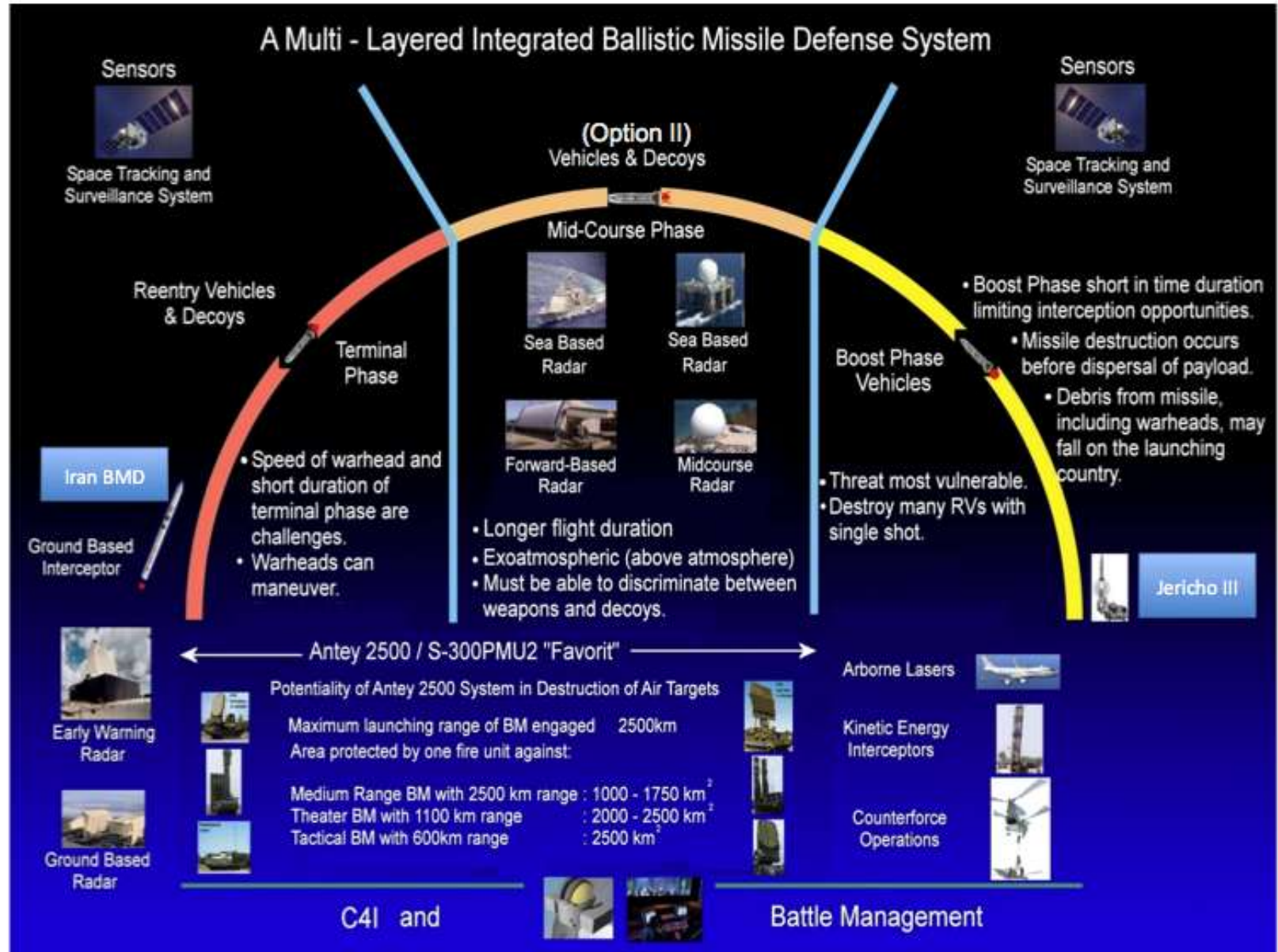




# Gulf Integrated Missile Defenses



# Iranian Integrated Missile Defenses



# *The Challenge of Nuclear Forces and Weapons of Mass Destruction*

# Current & Potential Nuclear Powers

Iran	SRBM < 1000 km	MRBM 1,000 – 3,000 km	IRBM 3,000 – 5,500 km	ICBM > 5,500 km
	Shahab-1	Shahab-3	Shahab-5	Shahab-6
Shahab-2	Shahab-4	-	-	
Mushak-120	Ghadr-101	-	-	
Mushak-160	Ghadr-110	-	-	
Mushak-200	IRIS	-	-	
-	Sajil	-	-	

Syria	SRBM < 1000 km	MRBM 1,000 – 3,000 km	IRBM 3,000 – 5,500 km	ICBM > 5,500 km
	SCUD-B	-	-	-
SCUD-C	-	-	-	-
SCUD-D	-	-	-	-
SS-21b	-	-	-	-

Israel	SRBM < 1000 km	MRBM 1,000 – 3,000 km	IRBM 3,000 – 5,500 km	ICBM > 5,500 km
	-	Jericho II	-	Jericho II

Pakistan	SRBM < 1000 km	MRBM 1,000 – 3,000 km	IRBM 3,000 – 5,500 km	ICBM > 5,500 km
	Shaheen I	Shaheen II	-	-
Hatf I	Ghauri I	-	-	
Hatf II	Ghauri II	-	-	
Hatf III	Ghauri II	-	-	
M-11	-	-	-	

India	SRBM < 1000 km	MRBM 1,000 – 3,000 km	IRBM 3,000 – 5,500 km	ICBM > 5,500 km
	Agni I	Agni II	Agni III	Surya
Prithvi I				
Prithvi II				



# Iran's Nuclear Programs: DNI Assessment - February 2010

The Iranian regime continues to flout UN Security Council restrictions on its nuclear program. There is a real risk that its nuclear program will prompt other countries in the Middle East to pursue nuclear options. We continue to assess Iran is keeping open the option to develop nuclear weapons in part by developing various nuclear capabilities that bring it closer to being able to produce such weapons, should it choose to do so. We do not know, however, if Iran will eventually decide to build nuclear weapons.

I would like to draw your attention to two examples over the past year that illustrate some of the capabilities Iran is developing.

First, published information from the International Atomic Energy Agency indicates that the number of centrifuges installed at Iran's enrichment plant at Natanz has grown significantly from about 3,000 centrifuges in late 2007 to over 8,000 currently installed. Iran has also stockpiled in that same time period approximately 1,800 kilograms of low-enriched uranium. However, according to the IAEA information, Iran also appears to be experiencing some problems at Natanz and is only operating about half of the installed centrifuges, constraining its overall ability to produce larger quantities of low-enriched uranium.

Second, Iran has been constructing—in secret until last September—a second uranium enrichment plant deep under a mountain near the city of Qom. It is unclear to us whether Iran's motivations for building this facility go beyond its publicly claimed intent to preserve enrichment know-how if attacked, but the existence of the facility and some of its design features raise our concerns. The facility is too small to produce regular fuel reloads for civilian nuclear power plants, but is large enough for weapons purposes if Iran opts configure it for highly enriched uranium production. It is worth noting that the small size of the facility and the security afforded the site by its construction under a mountain fit nicely with a strategy of keeping the option open to build a nuclear weapon at some future date, if Tehran ever decides to do so.

Iran's technical advancement, particularly in uranium enrichment, strengthens our 2007 NIE assessment that Iran has the scientific, technical and industrial capacity to eventually produce nuclear weapons, making the central issue its political will to do so. These advancements lead us to reaffirm our judgment from the 2007 NIE that Iran is technically capable of producing enough HEU for a weapon in the next few years, if it chooses to do so.

We judge Iran would likely choose missile delivery as its preferred method of delivering a nuclear weapon. Iran already has the largest inventory of ballistic missiles in the Middle East and it continues to expand the scale, reach and sophistication of its ballistic missile forces— many of which are inherently capable of carrying a nuclear payload.

We continue to judge Iran's nuclear decisionmaking is guided by a cost-benefit approach, which offers the international community opportunities to influence Tehran. Iranian leaders undoubtedly consider Iran's security, prestige and influence, as well as the international political and security environment, when making decisions about its nuclear program.

Iran's growing inventory of ballistic missiles and its acquisition and indigenous production of anti-ship cruise missiles (ASCMs) provide capabilities to enhance its power projection. Tehran views its conventionally armed missiles as an integral part of its strategy to deter—and if necessary retaliate against—forces in the region, including US forces. Its ballistic missiles are inherently capable of delivering WMD, and if so armed, would fit into this same strategy.

# **Iran's Nuclear Programs: DDNI Assessment - March 2010**

**We continue to assess Iran is keeping open the option to develop nuclear weapons though we do not know whether Tehran eventually will decide to produce nuclear weapons. Iran continues to develop a range of capabilities that could be applied to producing nuclear weapons, if a decision is made to do so.**

**During the reporting period, Iran continued to expand its nuclear infrastructure and continued uranium enrichment and activities related to its heavy water research reactor, despite multiple United Nations Security Council Resolutions since late 2006 calling for the suspension of those activities. Although Iran made progress in expanding its nuclear infrastructure during 200[1, some obstacles slowed progress during this period.**

**In 2009, Iran continued to make progress enriching uranium at the underground cascade halls at Natanz with first-generation centrifuges, and in testing and operating advanced centrifuges at the pilot plant there.**

**As of mid-November, Iran had produced about 1,800 kilograms of low-enriched uranium hexafluoride (LEUF6) gas product at Natanz, compared to 555 kilograms of LEUF6 in November 2008. Between January and November 2009, Iran increased the number of installed centrifuges from about 5,000 to about 8,700, but the number reported to be operating remains at about 3,~100.**

**In September, Iran disclosed that it was constructing a second gas-centrifuge uranium enrichment plant near the city of Qom that is designed to house approximately 3,000 centrifuges.**

**Iran in 2009 continued construction of the IR-40 Heavy Water Research Reactor. Iran during National Nuclear Day inaugurated its fuel manufacturing plant and claimed to have manufactured a fuel assembly for the IR-40.**

# Iran's CBW Programs: DDNI Assessment - March 2010

**We assess that Iran maintains the capability to produce chemical warfare (CW) agents and conducts research that may have offensive applications. Tehran continues to seek dual-use technologies that could advance its capability to produce CW agents. We judge that Iran is capable of weaponizing CW agents in a variety of delivery systems.**

**Iran probably has the capability to produce some biological warfare (BW) agents for offensive purposes, if it made the decision to do so. We assess that Iran has previously conducted offensive BW agent research and development. Iran continues to seek dual-use technologies that could be used for BW.**

## What Does Iran Mean by “100% Enrichment”

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On July 31, according to Iran's semiofficial Mehr News Agency, presidential chief of staff Esfandiar Rahim Mashai claimed that the West had raised no objections to President Mahmoud Ahmadinezhad's open proclamation that the Islamic Republic could build a nuclear bomb...Mashai's statement reportedly came as he was addressing the assembly of young advisors to the Ministry of Education. Rooz Online, a Britain-based website detested by the regime, analyzed reports on the speech from various semiofficial Iranian news outlets, such as Fars, the Iranian Students News Agency, and the Islamic Republic News Agency. Rooz noted that while other agencies reported rather bland comments, Mehr News Agency -- connected to the Supreme Leader's Islamic Propagation Organization -- gave a much blunter account.

According to Mehr's website, Mashai discussed Ahmadinezhad's February 7, 2010, speech at the National Center for Laser Science and Technology. Mashai reportedly said, "One of the points Dr. Ahmadinezhad announced during his visit to this center was the possibility of enriching to 100 percent, which means building an atom bomb [ke maani an sakht-e bomb-e atomi ast]. But it was interesting that not even one foreign media made a hullabaloo or an uproar. And this shows that they are not worried about an atom bomb. And essentially Dr. Ahmadinezhad had said this to test them in order to see what degree of worry they have about Iranian production of an atom bomb" (translation by the author).

...Interestingly, the week after Ahmadinezhad's February 7 speech, another important Iranian official publicly referred to 100 percent enrichment. On February 15, a government-connected website (dolat.ir) posted a long interview with Ali Akbar Salehi, director of the Atomic Energy Organization of Iran and former ambassador to the International Atomic Energy Agency. Near the end of the interview, Salehi repeatedly claimed that Iran has the legal right to enrich to 100 percent....



# Nuclear Uncertainty

- **Must plan to deal with possible Iranian force with unknown weapons characteristics, delivery systems, basing, and timelines.**
  - **Technology base now exists, enrichment to fissile levels is only limiting factor.**
- **Already a key factor in Iranian capability to conduct “wars of intimidation.”**
- **Clear Iran proceeding with extensive ballistic missile program regardless of whether it pursues the nuclear option.**
- **Cannot predict timeframe for nuclear threat. Worst case is 2009, but could well be 2015.**
  - **Break out, bomb in basement, tested, deployed, serious numbers, mobile, sheltered, LUA/LOW? Fission, boosted, thermonuclear?**
- **Chemical and biological options as well.**

## IAEA Report of May 31, 2010

**Iran's total LEU production at the Natanz fuel enrichment plant (FEP):** to date is reported to be 2,427 kg of low enriched uranium, including 362 kg estimated by Iran to have been produced from January 30, 2010 to May 1, 2010. The average monthly production of LEU at the FEP has increased slightly to 120 kg per month (for the last reporting period we noted it was 117 kg of LEU).

**Activity at the Pilot Fuel Enrichment Plant:** Iran has designated two cascades at the smaller, above-ground pilot fuel enrichment plant (PFEP) for the production of LEU enriched to 20 percent U235 for the Tehran Research Reactor.

**Enhanced safeguards at the PFEP:** enhanced safeguards were installed in late April 2010. The Agency noted however, that the modification of the PFEP to produce 20 percent enriched uranium "was not notified to the Agency by Iran with sufficient time for the Agency to adjust its safeguards procedures" as required by Iran's existing safeguards agreement.

**Continued R&D of advanced centrifuges, but no indication of timing of deployment:** Between February 3, 2010 and May 21, 2010, Iran introduced 74 kg of UF6 into a 20-machine cascade of IR-4 centrifuges, a 20-machine cascade of IR2 centrifuges and into single IR-1, IR-2 and IR-4 machines. These quantities of UF6 feed and the number of centrifuges involved indicate that this effort is still at the R&D stage.

**No progression IAEA requests for Fordow design information:** Iran "referred to its earlier answers on this subject and indicated that 'the Agency is not mandated to raise any question beyond the Safeguards Agreement.'"

**No cooperation on centrifuge production, R&D, uranium mining and milling:** Iran replied only that it was "continuing to cooperate with the Agency in accordance with its Safeguards Agreement" but did not provide the requested information.

**Bushehr fuel loading set:** Iran informed the IAEA that it will perform a technical examination of the fuel assemblies" for the Bushehr reactor prior to loading them into the reactor's core in Jun 2010. No specific date for the loading or official start of the reactor was provided.

**Pyroprocessing R&D underway; equipment moved:** Iran informed the IAEA in January 2010, during a design inspection of the Jabr Ibn Hayan Multipurpose Research Laboratory (JHL) in Tehran, that "pyroprocessing R&D activities had been initiated at JHL to study the electrochemical production of uranium metal." Iran subsequently informed that IAEA that such work was purely research related and aimed at studying the electrochemical behavior of uranyl ion in ionic liquid." It is not clear in the report whether and to what extent this work is related to Iran's weaponization research. During the IAEA's second visit to JHL which sought to clarify the nature of the work, inspectors found that the electrochemical cell had been moved.

**No progression weaponization issues:** No progress made on resolving what the IAEA terms "possible military dimensions" to Iran's nuclear program. Iran continues to refuse IAEA requests to discuss such issues and insists that the documentation on which such allegations are based are forgeries. The Agency reports that it "remains concerned about the possible existence in Iran of past or current undisclosed nuclear related activities, involving military related organizations, including activities related to the development of a nuclear payload for a missile. There are indications that certain of these activities may have continued beyond 2004."

# Why the US Did Not Accept the Turkish-Brazilian Proposal

- The proposed agreement did not take into account the major changes on the ground related to the Iranian nuclear program because of the Iranian actions in October 2009, at the forefront of which is the fact that Iran enriched uranium to the level of 20 percent. However, this is not the only reason.
  - Iran is ignoring its commitments to the nuclear non-proliferation agreement, and over the last six months:
  - It concealed the Qom facility;
  - Did not fully responded to questions by the IAEA regarding the possibility of there being a military side to the Iranian nuclear program.
- Iran has also almost doubled the amount of enriched uranium it has from Natanz [nuclear enrichment facility].
- When former IAEA chief Muhammad ElBaradei moved diagonally last autumn to lead negotiations in Vienna and came up with an excellent proposal that states that Iran should send uranium abroad in order to transform it into nuclear energy to use in its research facilities in Tehran to produce isotopes for medical uses. This took place and Iran possessed 1,600 kg of low-enriched uranium. However, from that point until now Iran speeded up the level of its nuclear program and produced, although it is hard to accurately determine the amount, around a further 1,000 kg of uranium.
- This is a change in circumstances on the ground. With Iran returning to the October 2009 agreement, the question was raised: What is the problem with the agreement now one year after agreeing to it? This does not take into consideration many of the changes on the ground. Also there are a number of points in the Tehran declaration that did not take into account the details that came in the agreement supervised by ElBaradei last October; for example details about protecting the stockpiles of Iranian fuel and the conditions for returning the uranium. Practically, all the details.

300 miles  
500 km

TURKEY

TURKMENISTAN

CASPIAN SEA

Lashkar A'bad



Tehran

Sites circled in red  
unknown pre-mid 2002

IRAQ



Arak



Isfahan



Natanz



Saghand

IRAN



Ardekan

MW Megawatts

Uranium processing facility

Uranium mines

Heavy-water facility

Research reactors / research facilities

Uranium enrichment facility

Light-water reactor (under construction)

MIDDLE EAST

AFGHANISTAN

PAKISTAN

KUWAIT



Bushehr

SAUDI ARABIA

BAHRAIN

QATAR

Gachin



Gulf of Oman

Vehicle Entrance Ramp  
(before burial)

Bunkered underground  
production halls

Admin/engineering  
office area

*DigitalGlobe Quickbird commercial satellite image*

20 SEP 02

Vehicle Entrance Ramp  
(after burial)

Bunkered underground  
Centrifuge cascade halls

Helicopter  
pads

New security  
wall

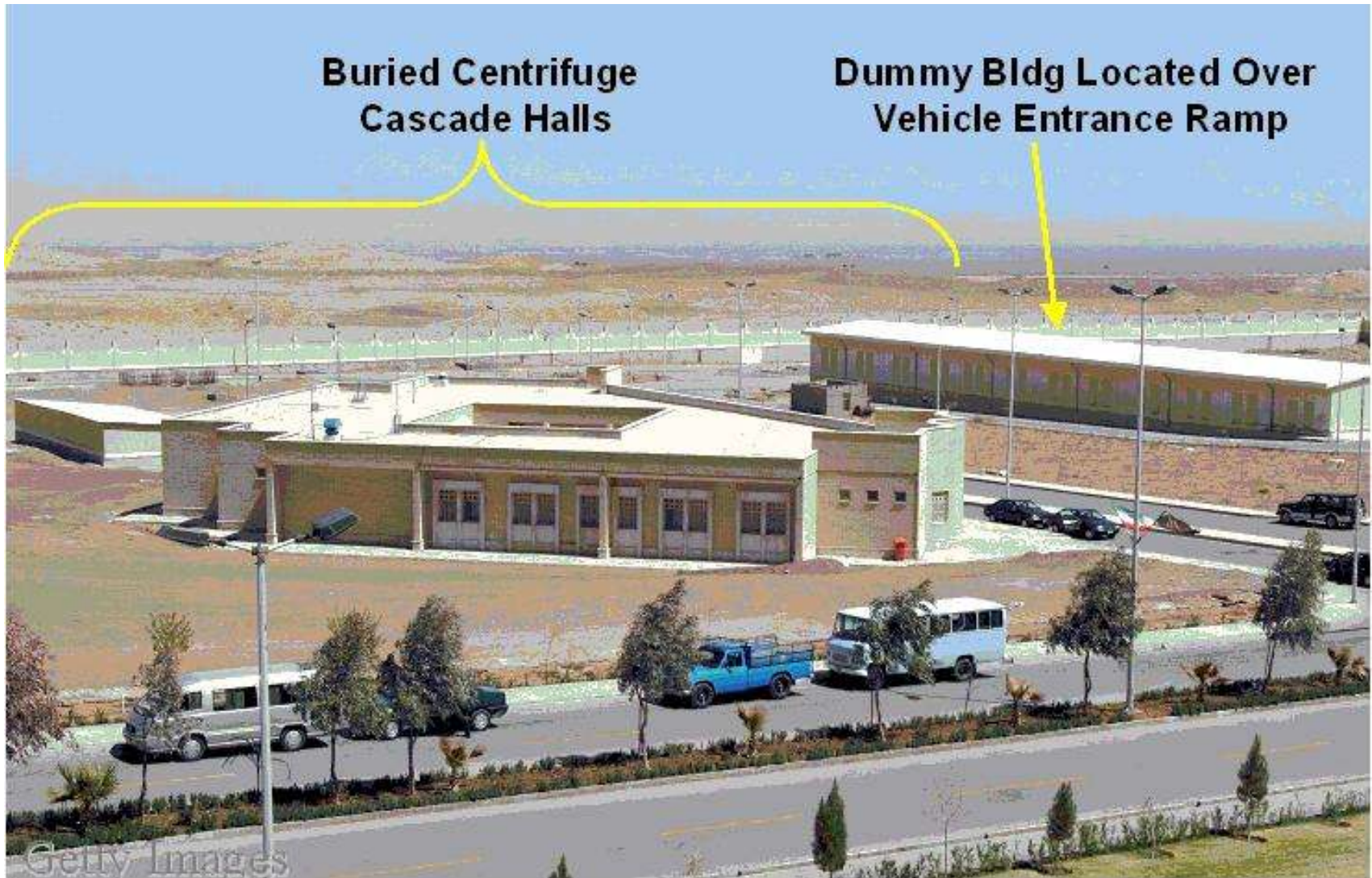
Dummy building  
concealing tunnel  
entrance ramp

Admin/engineering  
office area

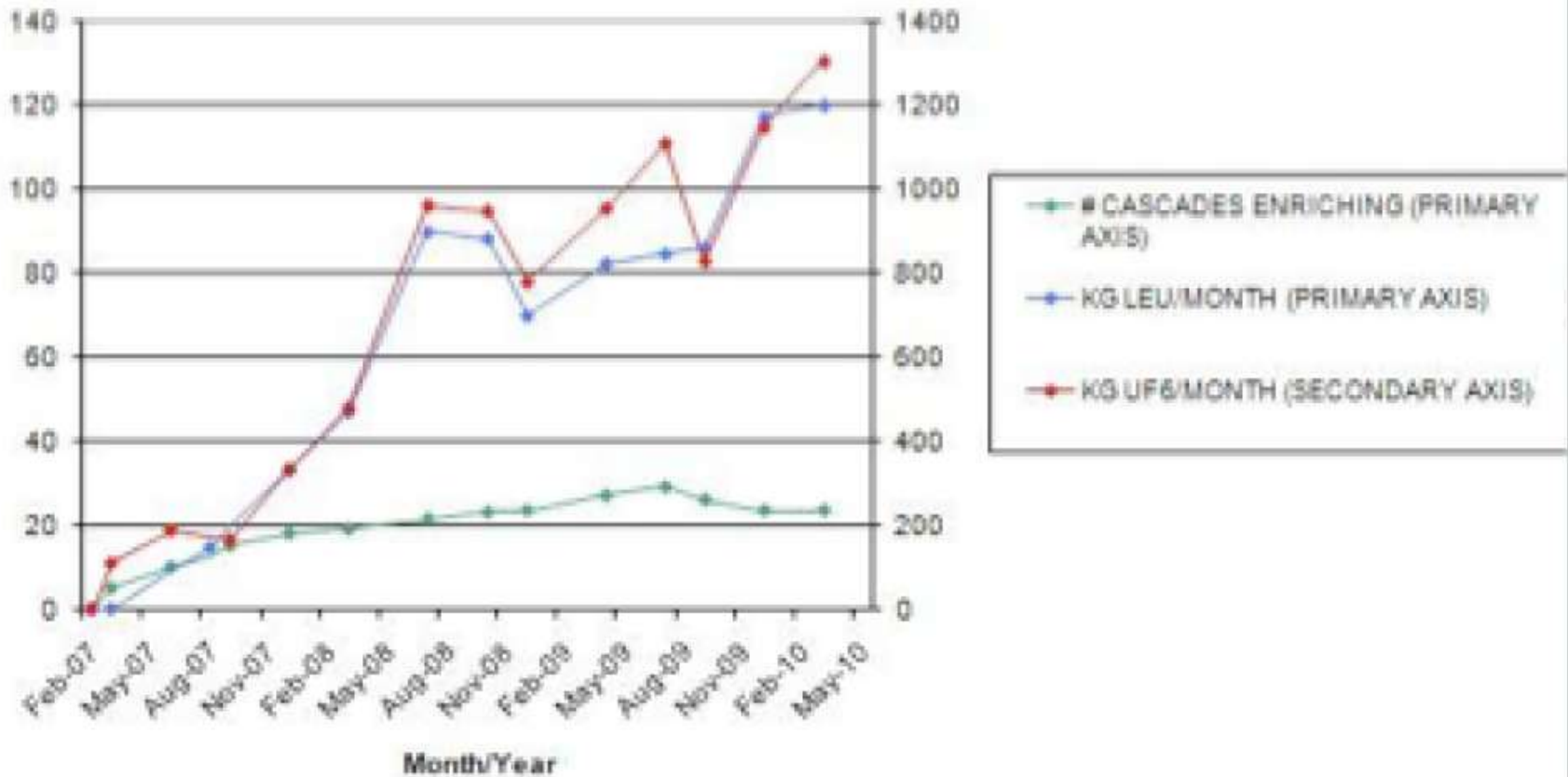
*DigitalGlobe Quickbird commercial satellite image*

21 JUL 04

## Seeking Effective Concealment



# ISIS Estimate of Trends at Natanz



ISIS,  
 IAEA Iran Report: Enrichment increases slightly; lack of adequate safeguards, David Albright and Jacqueline Shire, Charts prepared by Christina Walrond, May 31, 2010, <http://www.isisnucleariran.org/reports/>



## 20% Enrichment to Weapons Production?

- May 31 IAEA safeguards report on Iran is the first to contain any data on the production of 19.75 percent enriched uranium in IR-1 centrifuges at the Natanz Pilot Fuel Enrichment Plant (PFEP).
- The Natanz PFEP is configured to hold six 164-centrifuge cascades in total. Iran uses one of these cascade bays to test several more advanced types of centrifuges configured in 10, 20 and single unit cascades for R&D purposes. When Iran started making 19.75 percent enriched uranium, the PFEP held only one 164-centrifuge cascade, called cascade 1. It has now reinstalled a second cascade, called cascade 6, also designated for production of LEU enriched up to 20 percent. As of late May, cascade 6 had been prepared for enrichment but was not enriching pending the application of more sophisticated safeguards arrangements.
- Iran informed the IAEA that it planned to connect the two cascades, feeding the waste stream, or tails, of the first one into the second one. ...Iran stated in early 2010 that it intends to produce the 19.75 percent enriched uranium at a rate of 3 to 5 kilograms per month. Using the Iranian figures of 5.7 kilograms of 19.75 percent LEU, a 3.5 percent feed assay, and a 2 percent tails assay, the total annualized enrichment output, measured in separative work units (swu) per year, is almost 120 swu per year.
- Based on the experience at the FEP, a more realistic estimate for production in one cascade 25-50 kilograms per year of 19.75 percent LEU, or about 2.1-4.2 kilograms per month, where the tails assay is fixed at 2 percent.<sup>6</sup> This value reflects reliability problems similar to those encountered at the FEP and is more conservative than Iran's goal of 3-5 kilograms per month.
- How quickly Iran might produce 19.75 percent enriched uranium will depend on whether it uses only one cascade or decides to use more cascades at the PFEP. Although Iran has said that it will expand the enrichment effort beyond a single cascade, it has not revealed the enrichment level of the product of the second cascade.
- **...if Iran installs more cascades at the PFEP, it can speed up its production of 19.75 percent LEU. Nonetheless, ...one or two cascades would require several years to have enough 19.75 percent LEU to then further enrich and have sufficient weapon-grade uranium for a nuclear weapon. If Iran deploys five cascades it would produce this material in 0.5-1.7 years.**
- Iran has not stated how much 19.75 percent LEU it plans to produce or, for that matter, how many cascades it will ultimately devote to the production of this material. .
- .As long as Iran maintains its centrifuge capability, it can incrementally strengthen its nuclear weapons capabilities under the guise of “peaceful” declarations, and shorten the time needed to make enough weapon-grade uranium for a nuclear weapon.

## More Iranian Reactors?

- **Iran's announces in June 2010 that it wants to build four new nuclear research reactors. Such announcements can shroud other intentions, in this case an attempt by Iran to lay the basis for continued or even increased enrichment of 20 percent enriched uranium at the Natanz centrifuge plant.**

**On June 16, Ali Akbar Salehi, the head of Iran's Atomic Energy Organization announced that Iran would begin work on four new research reactors for the production of medical isotopes.**

- **The reactors' planned locations were not announced, but Salehi stated that they would be constructed in different parts of the country to serve medical centers. According to Salehi, the first reactor would replace the aging 5-megawatt Tehran Research Reactor (TRR), which has an estimated life span of fifteen more years.**
- **He said the new reactor would be more powerful, operating at 20 megawatts-thermal, and that design work would start immediately and the reactor would start in five years.**
- **Given that Iran has not built a reactor, and the Arak heavy water reactor construction project is delayed, this schedule is highly optimistic. This plan also raises questions about Iran's ability to meet minimal safety and environmental concerns about a new reactor and its fuel.**
- **Iran has still not learned to make research reactor fuel for the TRR. Salehi said the production of experimental fuel elements is slated for completion in March 2011. Iran hopes to produce the TRR's first batch of fuel elements by September 2011.**
- **Given the unrealistic nature of Iran's announcement, the question is whether it is a pretext for a claim that it must continue producing 20 percent enrichment to fuel these new research reactors. Iran could also use its latest announcement as justification for employing additional cascades for the production of 20 percent enriched uranium at Natanz, thereby further entrenching its enrichment capability by creating additional "facts on the ground" and exacerbating tensions with the UN Security Council.**

## How Close Is Iran to Enough Material?

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**No clear picture. Can only make estimate on basis of Natanz and know centrifuge activity. Ali Akbar Salehi, head of the Atomic Energy Organization of Iran, has reportedly stated that Iran has a new centrifuge with an enrichment output of 10 separative work units (swu) per machine per year.<sup>1</sup> He said that the P1 centrifuge has an output of 1.8 swu per year per machine.**

Ali Akbar Salehi, head of the Atomic Energy Organization of Iran announced July 12, 2010 that Iran intends on producing 120 kilograms of 19.75 percent uranium by September 2011, purportedly for use in the Tehran Research Reactor (TRR). Salehi also announced that Iran is working on producing fuel plates. .

If Iran stockpiles this amount of 19.75 percent enriched uranium, it could have nearly the amount needed to produce subsequently enough weapon-grade uranium for a bomb. Once it has enough 19.75 percent LEU, it is 90 percent of the way to weapon-grade uranium, meaning Iran could go from 19.75 percent to 90 percent in as little as one-tenth the time needed to go from natural uranium to weapon-grade uranium.

Iran could continue producing more 19.75 percent LEU once it reaches that initial September 2011 target of 120 kilograms. Iran could also cite this goal as the basis for enriching up to 19.75 percent in an increasing number of cascades and eventually surpass its target quantity.

Based on its own statements, Iran appears to be implementing a way to more efficiently use the tails and reduce the amount of 3.5 percent LEU feed it requires. Instead of storing the 2 percent enriched tails, it has stated it will further enrich them in a second cascade, in a recycling process. The final tails would be 0.7 percent and reusable in the cascades that make 3.5 percent LEU. By doing so, Iran could significantly reduce the amount of 3.5 percent LEU feed needed to make 19.75 percent material.

Such recycling would be particularly useful to a state attempting breakout with limited amounts of enriched uranium. For example, without recycling, Iran might need about 2,000 kilograms of 3.5 percent LEU to produce 25 kilograms of weapon-grade uranium, where weapon-grade is achieved in three steps. But by simultaneously enriching the tails in other cascades (and reducing the tails in those parallel cascades), Iran could reduce by half the amount of 3.5 percent LEU it would need to produce 25 kilograms of weapon-grade uranium. Although this recycling would require Iran to dedicate more centrifuge cascades to a breakout, it would allow for a smaller initial stock of 3.5 percent enriched LEU.

Salehi claims in today's statement that Iran is "now producing fuel plates." This is likely an exaggeration of Iran's capabilities. Today's statement demonstrates that Iran continues to make increasing amounts of 19.75 percent enriched uranium, but it still likely lacks the ability to manufacture fuel for the TRR. This paradox indicates that there is still time for an LEU fuel swap deal, where Iran halts further production of 19.75 percent LEU and sends this material out of the country with 3.5 percent LEU. This deal would be in Iran's interest if it intends on fueling the TRR in September of next year.

## DNI on Qom

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**...Iran has been constructing -- in secret until last September -- a second uranium enrichment plant deep under a mountain near the city of Qom. It is unclear to us whether Iran's motivations for building this facility go beyond its publicly claimed intent to preserve enrichment know-how if attacked, but the existence of the facility and some of its design features raise our concerns.**

**The facility is too small to produce regular fuel reloads for civilian nuclear power plants, but is large enough for weapons purposes if Iran opts configure it for highly enriched uranium production.**

**It is worth noting that the small size of the facility and the security afforded the site by its construction under a mountain fit nicely with a strategy of keeping the option open to build a nuclear weapon at some future date, if Tehran ever decides to do so.**

## IAEA on Qom

10. The DIV included a detailed visual examination of all areas of the plant, the taking of photographs of cascade piping and other process equipment, the taking of environmental samples and a detailed assessment of the design, configuration and capacity of the various plant components and systems. Iran provided access to all areas of the facility. The Agency confirmed that the plant corresponded with the design information provided by Iran and that the facility was at an advanced stage of construction, although no centrifuges had been introduced into the facility. Centrifuge mounting pads, header and sub-header pipes, water piping, electrical cables and cabinets had been put in place but were not yet connected; the passivation tanks, chemical traps, cold traps and cool boxes were also in place but had not been connected. In addition, a utilities building containing electricity transformers and water chillers had also been erected.

"As a result of the augmentation of the threats of military attacks against Iran, the Islamic Republic of Iran decided to establish contingency centers for various organizations and activities ...The Natanz Enrichment Plant was among the targets threatened with military attacks. Therefore, the Atomic Energy Organization requested the Passive Defence Organization to allocate one of those aforementioned centers for the purpose of [a] contingency enrichment plant, so that the enrichment activities shall not be suspended in the case of any military attack. In this respect, the Fordow site, being one of those constructed and prepared centers, [was] allocated to the Atomic Energy Organization of Iran (AEOI) in the second half of 2007. The construction of the Fordow Fuel Enrichment Plant then started. The construction is still ongoing. Thus the plant is not yet ready for operation and it is planned to be operational in 2011."

16. Iran stated that it did not have any other nuclear facilities that were currently under construction or in operation that had not yet been declared to the Agency. Iran also stated that any such future facilities would "be reported to the Agency according to Iran's obligations to the Agency". In a letter dated 6 November 2009, the Agency asked Iran to confirm that it had not taken a decision to construct, or to authorize construction of, any other nuclear facility which had not been declared to the Agency.

35. Iran has not suspended its enrichment related activities or its work on heavy water related projects as required by the Security Council.

36. ...Iran has neither implemented the Additional Protocol nor cooperated with the Agency in connection with the remaining issues of concern, which need to be clarified to exclude the possibility of military dimensions to Iran's nuclear programme. It is now well over a year since the Agency was last able to engage Iran in discussions about these outstanding issues. Unless Iran implements the Additional Protocol and, through substantive dialogue, clarifies the outstanding issues to the satisfaction of the Agency, the Agency will not be in a position to provide credible assurance about the absence of undeclared nuclear material and activities in Iran.

## ISIS on Qom

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**ISIS has obtained commercial satellite imagery from DigitalGlobe that narrows the time frame during which Iran would have begun construction of the gas centrifuge uranium enrichment plant near Qom. The satellite imagery indicates that Iran began construction of the enrichment facility after January 2006 but before June 2007. This time frame is consistent with a Reuters report that construction began in 2006.**

**ISIS previously assessed that the June 2004 and March 2005 satellite imagery seen on GoogleEarth depict the future site of the enrichment plant construction, but at the time show tunnel entrances that were likely not yet associated with the uranium enrichment construction project). The Atomic Energy Organization of Iran could have chosen among existing tunnel facilities throughout the country, and settled on this one near Qom, to site the covert enrichment plant. The January 2006 DigitalGlobe image of the site is very similar to the 2004 and 2005 imagery, which indicates that construction of the uranium enrichment plant had still not yet commenced as of that date.**

**The June 2007 image shows notable differences from the three previous images. A large amount of construction materials is visible next to the two tunnel entrances and at one of the adjacent construction staging areas, and possible cement storage is visible at another nearby construction staging area. ISIS assesses that construction associated with the covert gas centrifuge uranium enrichment facility had begun by this June 2007 image and that the construction materials seen in the image were then used in the transformation from what was likely a smaller tunnel facility into a much larger industrial facility, the gas centrifuge hall, built inside the mountain.**

**The January 2009 image shows a large amount of construction and excavation activity, and the September 27, 2009 still shows a large amount of construction activity, though the tunnel entrances and another excavation have been covered. A February 2000 image from GeoEye shows that the initial tunnel entrances were not yet present at that date**

## Images of Qom



## ISIS on the “Neutron Initiator”

ISIS’s assessment...is that the document describes a plan to develop a very specialized neutron initiator likely for use in a nuclear explosion. There has been considerable analysis of this document. ISIS encourages discussion and scrutiny of this document, including over the issue of its authenticity, and wants to add some additional information to its earlier assessment of this document.

ISIS understood at the time it received the English translation of the Farsi document that the Times’ source removed headings from the original Farsi-language document and retyped the text in order to protect intelligence-sensitive information. The source made it clear that it had taken these steps to protect its sources and methods and made no attempt to conceal such steps from the Times. The Times’ subsequent publication of both the Farsi document and its translation was not opposed by the source. ISIS understood that the source provided the document to relevant governments and the International Atomic Energy Agency (IAEA) in a different form. Nevertheless, the lack of an original document obviously complicates public assessments of the authenticity of the document. It also calls for the IAEA and governments to share their analysis of this document and how it fits into the other information they possess about Iran’s nuclear efforts.

If the document is forged or otherwise tampered with, the source risks a severe blow to its credibility in both the short and medium term. Likewise, if the documents had been forged and subsequently obtained by the Times’ source, the source’s credibility would still be considerably damaged. In discussions with officials from several governments prior to the publication of the Times article, ISIS found that these officials unanimously believed that the source was unlikely to take such a risk. But because of the seriousness of the implications of the document, thorough vetting of the document should continue.

What does this document describe?

If the document is genuine, it concerns the design of an experiment to develop a neutron initiator set off by high explosives. The document describes an experiment to calibrate neutron detectors to measure pulsed neutrons from an experiment. The document is not, as some have suggested, about developing ordinary pulsed neutron sources called “neutron generators” (NG) or “dense plasma focus” (PF) devices. The document acknowledges that Iran already has these devices and that they will be used for calibration in an experiment to detect pulsed neutrons from a “hot” source. The paper states that there are existing sources, namely NG and PF that will be used to calibrate the experiment and that there will then be a new experiment using a “hot source”, which is a hydrodynamic device. The hot source is assessed to be an implosion device that generates neutrons via D-D reactions (see figure 1).

The next few lines in the excerpt from the document ...tell us the purpose is to do a calibration experiment for the “hot source” using conventional NG and PF devices. The purpose of the project outlined in the document is making pulsed neutrons and preparing an experiment to prove that the hot source will work as planned, using a hydrodynamic device at a location that requires mobile labs.

That the experiment is hydrodynamic in nature, a reference to shock compression which has nothing to do with NG and PF devices and the need for mobile laboratories, implies that the hot experiments involve tens of kilograms of high explosives.

This paper is not about developing pulsed laboratory sources such as neutron generators and dense plasma focus devices. It describes using those devices to calibrate a hot experiment to see if a nuclear weapon will work using a technology developed by the United States and China to produce neutrons for initiation of a fission nuclear explosive.



# How Much is Enough?

## Amount of Fissile Material Need to Build a Basic Fission (Non-Boosted) Weapon

### Highly Enriched Uranium

**HEU (90% U-235)**

**Simple gun-type weapon**                      **90-110 lbs/40-50 kg**

**Simple implosion weapon**                      **33lbs/15 kg**

**Sophisticated implosion weapon**                      **20-26lbs/9-12kg**

### Weapons Grade Plutonium

**Simple implosion weapon**                      **14lbs/6 kg**

**Sophisticated implosion weapon**                      **4.5-9lbs/2-4 kg**

*Extract from the unclassified estimates in Union of Concerned Scientists, "Preventing Nuclear Terrorism Fact Sheet," April 2004, and work by Abdullah Toucan*

*The Current State of UN Sanctions:  
“Sticks and Carrots”*

# The New UN Sanctions: Overview - I

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- 1. Ban on Iranian certain nuclear and missile investment abroad.** Iran is prohibited from investing in sensitive nuclear activities abroad, like uranium enrichment and reprocessing activities, where it could acquire nuclear technology and know-how, as well as activities involving ballistic missiles capable of delivering nuclear weapons. The ban also applies to investment in uranium mining.
- 2. Conventional arms ban.** States are prohibited from selling or in any way transferring to Iran eight broad categories of heavy weapons (battle tanks, armored combat vehicles, large caliber artillery systems, combat aircraft, attack helicopters, warships, missiles or missile systems). States are similarly prohibited from providing technical or financial assistance for such systems, or spare parts. States are also to exercise vigilance and restraint in supplying any other arms or related materiel to Iran.
- 3. Ban on ballistic missile activities.** Iran is prohibited from undertaking any activity related to ballistic missiles capable of carrying nuclear weapons and States are required to take all necessary measure to prevent the transfer of related technology or technical assistance.
- 4. Additional items banned for transfer.** The resolution updates and adds to the list of technical items related to nuclear and missile proliferation that are banned for transfer to and from Iran.
- 5. New cargo inspection framework.** Iran is subject to a new regime for inspection of suspicious cargo to detect and stop Iran's smuggling. States should inspect any vessel on their territory suspected of carrying prohibited cargo, including banned conventional arms or sensitive nuclear or missile items. States are also expected to cooperate in such inspections on the high seas.
- 6. New procedures to deal with contraband items.** Once prohibited items are found, States are now obligated to seize and dispose of the items.
- 7. Ban on bunkering services.** States are required not to provide critical support services (e.g., fuel, water) to ships suspected of carrying prohibited cargo.
- 8. Measures to restrict the Islamic Republic of Iran Shipping Lines (IRISL) and Iran Air's cargo division.** States must require their nationals to exercise vigilance over IRISL, a known sanctions violator. Three IRISL-

## The New UN Sanctions: Overview - II

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related companies will have their assets frozen. States are requested to report any information on activities by IRISL and Iran's Air's cargo division to evade sanctions, including by renaming vessels.

9. **New tools to block proliferation finance.** States are called upon to prevent any financial service -- including insurance or reinsurance -- and freeze any asset that could contribute to Iran's proliferation. This broad language will help states take action when there are suspected financial links to Iran's banned nuclear activities.

10. **Vigilance over all Iran's companies.** States are required to ensure their nationals exercise vigilance when doing business with any Iranian firm, including IRGC and IRISL, to make sure such business does not contribute to Iran's proliferation.

11. **New banking measures.** States are called upon to prohibit on their territories new banking relationships with Iran, including the opening of any new branches of Iranian banks, joint ventures and correspondent banking relationships, if there is a suspected link to proliferation. States also should prohibit their own financial institutions from opening branches in Iran if there is a suspected link to proliferation.

12. **New measures to limit the role of the Islamic Revolutionary Guard Corps (IRGC).** The resolution highlights the IRGC's role in proliferation and requires states to mandate that businesses exercise vigilance over all transactions involving the IRGC. Fifteen IRGC-related companies linked to proliferation will have their assets frozen.

13. **Targeted sanctions on specific individuals and entities.** Forty Iranian companies and one individual will be subject to an asset freeze. The individual -- the head of a critical nuclear research program -- will also be subject to a travel ban. Thirty-five additional individuals previously subject to "travel vigilance" will now be subject to a travel ban.

14. **Appointment of a UN sanctions monitoring panel.** A UN "Panel of Experts" will be established to monitor states' implementation of the sanctions, report on sanctions violations and recommend ways to continually improve enforcement.

## UNSCR 1929 (2010) Sanctions on Iran: Part One

“5. *Decides* that Iran shall without delay comply fully and without qualification with its IAEA Safeguards Agreement, including through the application of modified Code 3.1 of the Subsidiary Arrangement to its Safeguards Agreement, *calls upon* Iran to act strictly in accordance with the provisions of the Additional Protocol to its IAEA Safeguards Agreement that it signed on 18 December 2003, *calls upon* Iran to ratify promptly the Additional Protocol, and *reaffirms* that, in accordance with Articles 24 and 39 of Iran’s Safeguards Agreement, Iran’s Safeguards Agreement and its Subsidiary Arrangement, including modified Code 3.1, cannot be amended or changed unilaterally by Iran, and *notes* that there is no mechanism in the Agreement for the suspension of any of the provisions in the Subsidiary Arrangement

“6. *Reaffirms* that, in accordance with Iran’s obligations under previous resolutions to suspend all reprocessing, heavy water-related and enrichment-related activities, Iran shall not begin construction on any new uranium-enrichment, reprocessing, or heavy water-related facility and shall discontinue any ongoing construction of any uranium-enrichment, reprocessing, or heavy water-related facility;

“7. *Decides* that Iran shall not acquire an interest in any commercial activity in another State involving uranium mining, production or use of nuclear materials and technology as listed in INFCIRC/254/Rev.9/Part 1, in particular uranium-enrichment and reprocessing activities, all heavy-water activities or technology-related to ballistic missiles capable of delivering nuclear weapons, and *further decides* that all States shall prohibit such investment in territories under their jurisdiction by Iran, its nationals, and entities incorporated in Iran or subject to its jurisdiction, or by persons or entities acting on their behalf or at their direction, or by entities owned or controlled by them;

“8. *Decides* that all States shall prevent the direct or indirect supply, sale or transfer to Iran, from or through their territories or by their nationals or individuals subject to their jurisdiction, or using their flag vessels or aircraft, and whether or not originating in their territories, of any battle tanks, armoured combat vehicles, large calibre artillery systems, combat aircraft, attack helicopters, warships, missiles or missile systems as defined for the purpose of the United Nations Register of Conventional Arms, or related materiel, including spare parts, or items as determined by the Security Council or the Committee established pursuant to resolution 1737 (2006) (“the Committee”), *decides* further that all States shall prevent the provision to Iran by their nationals or from or through their territories of technical training, financial resources or services, advice, other services or assistance related to the supply, sale, transfer, provision, manufacture, maintenance or use of such arms and related materiel, and, in this context, *calls upon* all States to exercise vigilance and restraint over the supply, sale, transfer, provision, manufacture and use of all other arms and related materiel;

“9. *Decides* that Iran shall not undertake any activity related to ballistic missiles capable of delivering nuclear weapons, including launches using ballistic missile technology, and that States shall take all necessary measures to prevent the transfer of technology or technical assistance to Iran related to such activities;

“10. *Decides* that all States shall take the necessary measures to prevent the entry into or transit through their territories of individuals designated in Annex C, D & E of resolution 1737 (2006), Annex I of resolution 1747 (2007), Annex I of resolution 1803 (2008) and Annexes I and II of this resolution, or by the Security Council or the Committee pursuant to paragraph 10 of resolution 1737 (2006), except where such entry or transit is for activities directly related to the provision to Iran of items in subparagraphs 3(b)(i) and (ii) of resolution 1737 (2006) in accordance with paragraph 3 of resolution 1737 (2006), *underlines* that nothing in this paragraph shall oblige a State to refuse its own nationals entry into its territory, and *decides* that the measures imposed in this paragraph shall not apply when the Committee determines on a case-by-case basis that such travel is justified on the grounds of humanitarian need, including religious obligations, or where the Committee concludes that an exemption would otherwise further the objectives of this resolution, including where Article XV of the IAEA Statute is engaged;

## UNSCR 1929 (2010) Sanctions on Iran: Part Two

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“11. *Decides* that the measures specified in paragraphs 12, 13, 14 and 15 of resolution 1737 (2006) shall apply also to the individuals and entities listed in Annex of this resolution and to any individuals or entities acting on their behalf or at their direction, and to entities owned or controlled by them, including through illicit means, and to any individuals and entities determined by the Council or the Committee to have assisted designated individuals or entities in evading sanctions of, or in violating the provisions of, resolutions 1737 (2006), 1747 (2007), 1803 (2008) or this resolution;

“12. *Decides* that the measures specified in paragraphs 12, 13, 14 and 15 of resolution 1737 (2006) shall apply also to the Islamic Revolutionary Guard Corps (IRGC, also known as “Army of the Guardians of the Islamic Revolution”) individuals and entities specified in Annex II, and to any individuals or entities acting on their behalf or at their direction, and to entities owned or controlled by them, including through illicit means, and *calls upon* all States to exercise vigilance over those transactions involving the IRGC that could contribute to Iran’s proliferation-sensitive nuclear activities or the development of nuclear weapon delivery systems;

“13. *Decides* that for the purposes of the measures specified in paragraphs 3, 4, 5, 6 and 7 of resolution 1737 (2006), the list of items in S/2006/814 shall be superseded by the list of items in INFCIRC/254/Rev.9/Part 1 and INFCIRC/254/Rev.7/Part 2, and any further items if the State determines that they could contribute to enrichment-related, reprocessing or heavy water-related activities or to the development of nuclear weapon delivery systems, and further *decides* that for the purposes of the measures specified in paragraphs 3, 4, 5, 6 and 7 of resolution 1737 (2006), the list of items contained in S/2006/815 shall be superseded by the list of items contained in S/2010/263;

“14. *Calls upon* all States to inspect, in accordance with their national authorities and legislation and consistent with international law, in particular the law of the sea and relevant international civil aviation agreements, all cargo to and from Iran, in their territory, including seaports and airports, if the State concerned has information that provides reasonable grounds to believe the cargo contains items the supply, sale, transfer, or export of which is prohibited by paragraphs 3, 4 or 7 of resolution 1737 (2006), paragraph 5 of resolution 1747 (2007), paragraph 8 of resolution 1803 (2008) or paragraphs 8 or 9 of this resolution, for the purpose of ensuring strict implementation of those provisions;

“15. *Notes* that States, consistent with international law, in particular the law of the sea, may request inspections of vessels on the high seas with the consent of the flag State, and *calls upon* all States to cooperate in such inspections if there is information that provides reasonable grounds to believe the vessel is carrying items supply, sale, transfer, or export of which is prohibited by paragraphs 3, 4 or 7 of resolution 1737 (2006), paragraph 5 of resolution 1747 (2007), paragraph 8 of resolution 1803 (2008) or paragraphs 8 or 9 of this resolution, for the purpose of ensuring strict implementation of those provisions;

“19. *Decides* that the measures specified in paragraphs 12, 13, 14 and 15 of resolution 1737 (2006) shall also apply to the entities of the Islamic Republic of Iran Shipping Lines (IRISL) as specified in Annex III and to any person or entity acting on their behalf or at their direction, and to entities owned or controlled by them including through illicit means, or determined by the Council or the Committee to have assisted them in evading the sanctions of, or in violating the provisions of, resolutions 1737 (2006), 1747 (2007), 1803 (2008) or this resolution;

## UNSCR 1929 (2010) Sanctions on Iran: Part Three

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“20. *Requests* all Member States to communicate to the Committee any information available on transfers or activity by Iran Air’s cargo division or vessels owned or operated by the Islamic Republic of Iran Shipping Lines (IRISL) to other companies that may have been undertaken in order to evade the sanctions of, or in violation of the provisions of, resolutions 1737 (2006), 1747 (2007), 1803 (2008) or this resolution, including renaming or re-registering of aircraft, vessels or ships and requests the Committee to make that information widely available;

“21. *Calls upon* all States, in addition to implementing their obligations pursuant to resolutions 1737 (2006), 1747 (2007), 1803 (2008) and this resolution, to prevent the provision of financial services, including insurance or re-insurance, or the transfer to, through, or from their territory, or to or by their nationals or entities organized under their laws (including branches abroad), or persons or financial institutions in their territory, of any financial or other assets or resources if they have information that provides reasonable grounds to believe that such services, assets or resources could contribute to Iran’s proliferation-sensitive nuclear activities, or the development of nuclear weapon delivery systems, including by freezing any financial or other assets or resources on their territories or that hereafter come within their territories, or that are subject to their jurisdiction or that hereafter become subject to their jurisdiction, that are related to such programmes or activities and applying enhanced monitoring to prevent all such transactions in accordance with their national authorities and legislation;

“22. *Decides* that all States shall require their nationals, persons subject to their jurisdiction and firms incorporated in their territory or subject to their jurisdiction to exercise vigilance when doing business with entities incorporated in Iran or subject to Iran’s jurisdiction, including those of the IRGC and IRISL, and any individuals or entities acting on their behalf or at their direction, and entities owned or controlled by them, including through illicit means, if they have information that provides reasonable grounds to believe that such business could contribute to Iran’s proliferation-sensitive nuclear activities or the development of nuclear weapon delivery systems or to violations of resolutions 1737 (2006), 1747 (2007), 1803 (2008) or this resolution;

“23. *Calls upon* States to take appropriate measures that prohibit in their territories the opening of new branches, subsidiaries, or representative offices of Iranian banks, and also that prohibit Iranian banks from establishing new joint ventures, taking an ownership interest in or establishing or maintaining correspondent relationships with banks in their jurisdiction to prevent the provision of financial services if they have information that provides reasonable grounds to believe that these activities could contribute to Iran’s proliferation-sensitive nuclear activities or the development of nuclear weapon delivery systems;

“24. *Calls upon* States to take appropriate measures that prohibit financial institutions within their territories or under their jurisdiction from opening representative offices or subsidiaries or banking accounts in Iran if they have information that provides reasonable grounds to believe that such financial services could contribute to Iran’s proliferation-sensitive nuclear activities or the development of nuclear weapon delivery systems;

**Resolution Annex I: Individuals and entities involved in nuclear or ballistic missile activities**

**Resolution Annex II: Entities owned, controlled, or acting on behalf of the Islamic Revolutionary Guard Corps**

**Resolution Annex III: Entities owned, controlled, or acting on behalf of the Islamic Republic of Iran Shipping Lines (IRISL)**

**Resolution Annex IV: Proposal to the Islamic Republic of Iran by China, France, Germany, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland, the United States of America and the European Union**

# UNSCR 1929 (2010) Incentives to Iran: Part One

## Agree to:

- Recognize Iran's right to develop research, production and use of nuclear energy for peaceful purposes in conformity with its NPT obligations;
- Treat Iran's nuclear program in the same manner as that of any Non-nuclear Weapon State Party to the NPT once international confidence in the exclusively peaceful nature of Iran's nuclear program is restored.

## Nuclear Energy

- Reaffirmation of Iran's right to nuclear energy for exclusively peaceful purposes in conformity with its obligations under the NPT.
- Provision of technological and financial assistance necessary for Iran's peaceful use of nuclear energy, support for the resumption of technical cooperation projects in Iran by the IAEA.
- Support for construction of LWR based on state-of-the-art technology.
- Support for R&D in nuclear energy as international confidence is gradually restored.
- Provision of legally binding nuclear fuel supply guarantees.
- Cooperation with regard to management of spent fuel and radioactive waste.

## Political

- Improving the six countries' and the EU's relations with Iran and building up mutual trust.
- Encouragement of direct contact and dialogue with Iran.
- Support Iran in playing an important and constructive role in international affairs.
- Promotion of dialogue and cooperation on non-proliferation, regional security and stabilization issues.
- Work with Iran and others in the region to encourage confidence-building measures and regional security.
- Establishment of appropriate consultation and cooperation mechanisms.
- Support for a conference on regional security issues.
- Reaffirmation that a solution to the Iranian nuclear issue would contribute to non-proliferation efforts and to realizing the objective of a Middle East free of weapons of mass destruction, including their means of delivery.
- Reaffirmation of the obligation under the UN Charter to refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any State or in any other manner inconsistent with the Charter of the United Nations.
- Cooperation on Afghanistan, including on intensified cooperation in the fight against drug trafficking, support for programs on the return of Afghan refugees to Afghanistan; cooperation on reconstruction of Afghanistan; cooperation on guarding the Iran-Afghan border.

## Economic

- Steps towards the normalization of trade and economic relations, such as improving Iran's access to the international economy, markets and capital through practical support for full integration into international structures, including the World Trade Organization, and to create the framework for increased direct investment in Iran and trade with Iran.



# UNSCR 1929 (2010) Incentives to Iran: Part Two

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## **Energy Partnership**

- Steps towards the normalization of cooperation with Iran in the area of energy: establishment of a long-term and wide-ranging strategic energy partnership between Iran and the European Union and other willing partners, with concrete and practical applications/measures.

## **Agriculture**

- Support for agricultural development in Iran. Facilitation of Iran's complete self-sufficiency in food through cooperation in modern technology.

## **Environment, Infrastructure**

- Civilian Projects in the field of environmental protection, infrastructure, science and technology, and high-tech:
- Development of transport infrastructure, including international transport corridors.
- Support for modernization of Iran's telecommunication infrastructure, including by possible removal of relevant export restrictions.

## **Civil Aviation**

- Civil aviation cooperation, including the possible removal of restrictions on manufacturers exporting aircraft to Iran:
- Enabling Iran to renew its civil aviation fleet;
- Assisting Iran to ensure that Iranian aircraft meet international safety standards.

## **Economic, social and human development/humanitarian issues**

- Provide, as necessary, assistance to Iran's economic and social development and humanitarian need.
- Cooperation/technical support in education in areas of benefit to Iran:
- Supporting Iranians to take courses, placements or degrees in areas such as civil engineering, agriculture and environmental studies;
- Supporting partnerships between Higher Education Institutions e.g. public health, rural livelihoods, joint scientific projects, public administration, history and philosophy.
- Cooperation in the field of development of effective emergency response capabilities (e.g. seismology, earthquake research, disaster control etc.).
- Cooperation within the framework of a "dialogue among civilizations".

## **Implementation mechanism**

- Constitution of joint monitoring groups for the implementation of a future agreement.

## US Goals for UNSCR 1929 (2010)

The United States is determined to prevent Iran from developing nuclear weapons. Over the past 18 months, we have pursued our broad policy goals that have been principally focused on tough-minded diplomacy – including both engagement and pressure. We have sought to sharpen the choices now before the Iranian leadership. We have sought to demonstrate the benefits to Iran and the Iranian people if Iran adheres to its international obligations. And we have sought to intensify the costs of continued defiance, and to show Iran that pursuit of nuclear weapons will make it less secure, not more.

Last year, we embarked on an unprecedented effort to engage with Iran. We did so without any illusions about whom we were dealing with, or the scope of our differences over the past thirty years. Engagement is both a test of Iranian intentions, and an investment in a partnership with a growing coalition of countries deeply concerned about Iran’s nuclear ambitions. We have sought, and continue to seek, opportunities for Iran to demonstrate convincingly that its nuclear program is intended entirely for peaceful purposes. These opportunities have not been embraced by Iran. In Geneva last October, we supported a creative proposal by the International Atomic Energy Agency (IAEA) to provide fuel for the production of medical isotopes at the Tehran Research Reactor. Unfortunately, what appeared to be a constructive beginning in Geneva was later spurned by the Iranian leadership. Instead, since October, Iran has failed to cooperate fully with the IAEA regarding the previously covert enrichment facility near Qom; announced plans for ten new enrichment facilities; refused to continue discussions with the P5+1 regarding international concerns about its nuclear program; provocatively announced that it would boost enrichment to 20 percent, in further violation of UN Security Council resolutions; and continued its refusal to cooperate with the IAEA’s investigation into its nuclear program, drawing new rebukes from the IAEA Director General in his most recent reports.

Iran’s intransigence has left the international community no choice but to employ a second tool of diplomacy: pressure. The adoption of UNSCR 1929 was an essential first step in that effort, building upon and strengthening previous sanctions resolutions:

- It bans transfers of major conventional weapon systems to Iran;
- It bans all Iranian activities related to ballistic missiles that could deliver a nuclear weapon;
- It establishes a framework for cargo inspections to detect and stop Iran’s smuggling and acquisition of illicit items;
- It prohibits Iran from investing abroad in sensitive nuclear activities, such as uranium mining;
- It creates important new tools to help block Iran’s use of the international financial system to fund and facilitate its nuclear and other destabilizing weapons programs;
- It targets directly the role of the Islamic Revolutionary Guard Corps (IRGC) in Iran’s proliferation efforts, adding fifteen specific IRGC entities to the list of designations for asset freeze;
- And for the first time, the Security Council highlighted formally in UNSCR 1929 the potential links between Iran’s energy sector and its nuclear ambitions.

Our goal now is to ensure the most aggressive implementation of these sanctions as possible. We are not alone. The European Union has acted strongly to follow up by endorsing a series of significant steps, including a prohibition on new investment in Iran’s energy sector, bans on the transfer of key technology, and tough measures against Iranian banks and correspondent banking relationships, including closer monitoring of Iranian banks operating in the EU. On July 26, Canada announced its supplement to UNSCR 1929, the Special Economic Measures Act, which incorporates restrictions similar to those in recent U.S. and EU sanctions.

# *The Potential Nuclear/ Missile Arms Race*

## **Iran's Hypothetical Forces in 2020**

- **Less than 50 nuclear weapons, most fission, possibly some boosted. 30 Nuclear warheads, 20 bombs.**
  - **Most 20-30 Kt, some 100 KT**
- **100 Shahab 3 and 3 ER on mobile TELs. 60 TELs.**
- **Su-24, F-14 convert, and Su-37 strike aircraft.**
- **Reverse engineered KH-55 cruise missiles.**
- **Mustard and persistent nerve gas, stable bombs, bombs and warheads with cluster munitions.**
- **Limited satellite targeting and damage assessment capability.**
- **Limited ballistic missile point defense capability with SA-300/SA-400**
- **Meaningful civil defense? No.**

## Guesstimates of Israel's Nuclear Forces

- **Israel almost certainly has a significant, if undeclared, inventory of nuclear weapons.**
- **Reports were manufactured at the Negev Nuclear Research Center, outside the town of Dimona.**
- **Based on estimates of the plutonium production capacity of the Dimona reactor, Israel has approximately 100-200 advanced nuclear explosive devices but such estimates are based on nominal production figures and very uncertain estimates of the material required for a given number of nuclear weapons. They do not address yield, design, or the mix of fission, boosted, and thermonuclear weapons,**
- **Global Security estimates that the total could be as high as 375 to 500 weapons. No reliable unclassified data on Israel mix of nuclear weapons, but Israel did obtain substantial amounts of nuclear weapons design and test data from France before 1968, and probably has a stock of both tactical and thermonuclear weapons.**

# Guesstimates of Israel's Missile Forces

**Virtually any Israeli fighter could be equipped with nuclear bombs or stand off weapons, but its F-15s and F-16s seem the most likely delivery platforms.**

**No reliable unclassified reports on Israel's ballistic missile holdings, but **unclassified sources speculate Israel has the following capabilities:****

**Jericho I:** Range of 500 km (310 mi) and a nominal CEP of 1,000 m (3,300 ft), with a payload of 400 kilograms (880 lb). It seems to be close or identical to the Dassault MD-620, which was test fired in 1965. IAI produced such missiles at its Beit Zachariah facility. It also reports that that around 100 missiles of this type were produced, although there were some problems with its guidance systems. It also reports that The Jericho I is now considered obsolete and was taken out of service during the 1990s.

**Jericho II:** Solid fuel, two-stage medium-range ballistic missile system tested in launches into the Mediterranean from 1987 to 1992. Reports that the longest was around 1,300 km, and fired from the facility at Palmachim, south of Tel Aviv. Jane's reports that a test launch of 1,400 km is believed to have taken place from South Africa's Overberg Test Range in June 1989, but other sources indicate that this was part of a series of launches of a system using a larger booster. reports that it has a 1,000 kg payload, capable of carrying a considerable amount of high explosives or a 1 MT yield nuclear warhead. It uses a two-stage solid propellant engine with a separating warhead. It also reports that the missile can be launched from a silo, a railroad flat truck, or a mobile vehicle. This gives it the ability to be hidden, moved quickly, or kept in a hardened silo, ensuring survival against any attack.

**Jericho III:** Estimates differ sharply. It may have entered service in the late 1990s, but some put it in the late 2006-2008 period. It is reported to be a three-stage solid propellant and a payload of 1,000 to 1,300 kg. Wikipedia reports it may have a single 750 kg nuclear warhead or two or three low yield MIRV warheads; an estimated launch weight of 30,000 kg and a length of 15.5 m with a width of 1.56 m. Some reports indicate that Jericho III has a radar guided, terminal homing warhead in addition to inertial guidance, and silo-based with road and rail mobility. No reliable estimate of its range exists. It may have maximum range of about 7,800 km with a smaller 500 kg payload. This could hit any target in the Middle East and targets as far away as Pakistan and Russia,

## **Israel's Hypothetical Forces in 2020**

- **200-400 boosted and fusion weapons.**
  - **Most 20-100 Kt variable yield, some 1 Megaton.**
- **100 Jericho 1 and 2.**
- **30-100 Jericho 3/ER.**
- **JSF, F15I, F-16I with nuclear-armed cruise missiles, advanced conventional precision strike capability.**
- **3 Dolphin submarines with nuclear armed SLCMs.**
- **High resolution satellite targeting and damage assessment capability.**
- **Moderate ballistic missile point and area defense capability with Arrow IV/V and Patriot PAC-3 TMD.**
- **CW? Assume Yes. BW? Assume No.**
- **Meaningful civil defense? CW only.**

## Strike on Iran?

- **Timelines: Acquisition? Deployment? Modernization?**
- **Targeting intelligence?**
- **Dispersal, hardening, concealment?**
- **Hardening vs. Attack Lethality**
- **SEAD: Penetration? Suppression? Kill?**
- **Range-payload, refuel, recovery**
- **Restrike? Penetration corridor enforcement?**
- **LOW? LUA? Covert?**



## Post-Strike on Iran/ Parallel Iranian Options

- **IR-2, IR-3, IR-3 “cooled,” IR-4**
- **Folded centrifuge**
- **Concealed heavy water reactor**
- **LWR cannibalization**
- **LWR download**
- **Dirty weapons**
- **Basic biological**
- **Genetic engineered weapons**

# Key Force Posture Decisions

- **US and/or Israel**
  - **Prevent, preempt**, contain, deter, retaliate, mutual assured destruction.
- **Iran and Israel:**
  - In reserve (secure storage), launch on warning (LOW), launch under attack (LOA), ride out and retaliate
  - Continuous alert, dispersal
  - Point, wide area defense goals
- **Israel:**
  - Basing mode: sea basing, sheltered missiles.
  - Limited strike, existential national, multinational survivable.
- **US:**
  - Level of defensive aid.
  - Ambiguous response
  - Clear deployment of nuclear response capability.
  - Extended deterrence. Assured retaliation.
- **Gulf:**
  - Passive (wait out), defensive, or go nuclear.
  - Ballistic, cruise missile, air defense.
  - Seek extended deterrence from US

## Key Force Posture Decisions - II

- **Syria:**
  - **Link or decouple from Iran.**
  - **Passive (tacit threat) or active (clear, combat ready deployment).**
- **Non-State Actor:**
  - **Tacit or covert capability.**
  - **Proven capability.**
  - **Deployment mode: Hidden, dispersed, pre-emplaced**