The Iranian Nuclear Challenge: GCC Security, Risk Assessment, and US Extended Deterrence

Abdullah Toukan and Anthony H. Cordesman
Arleigh A. Burke Chair in Strategy

February 1, 2011
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</tbody>
</table>
The Geo-Strategic Importance of the GCC States
<table>
<thead>
<tr>
<th></th>
<th>Kuwait</th>
<th>Bahrain</th>
<th>Qatar</th>
<th>UAE</th>
<th>Oman</th>
<th>KSA</th>
<th>Iran</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>2,789,132 (139)</td>
<td>738,004 (163)</td>
<td>840,926 (159)</td>
<td>4,975,593 (114)</td>
<td>2,967,717 (136)</td>
<td>25,731,776 (46)</td>
<td>7,692,300 (18)</td>
</tr>
<tr>
<td>Population Growth Rate</td>
<td>3.501% (5)</td>
<td>1.243% (100)</td>
<td>0.869% (130)</td>
<td>3.561% (4)</td>
<td>1.996% (59)</td>
<td>1.548% (80)</td>
<td>1.253% (99)</td>
</tr>
<tr>
<td>GDP (Purchasing Power Parity) $Billions</td>
<td>$144.3 (59)</td>
<td>$29.82 (108)</td>
<td>$122.2 (61)</td>
<td>$199.8 (53)</td>
<td>$76.53 (80)</td>
<td>$622.5 (23)</td>
<td>$863.5 (19)</td>
</tr>
<tr>
<td>GDP Official Exchange Rate $Billion</td>
<td>$117.30</td>
<td>$21.73</td>
<td>$126.50</td>
<td>$239.70</td>
<td>$53.78</td>
<td>$434.40</td>
<td>$337.90</td>
</tr>
<tr>
<td>GDP Real Growth Rate</td>
<td>3.2% (113)</td>
<td>3.9% (84)</td>
<td>19.4% (1)</td>
<td>2.6% (137)</td>
<td>3.6% (95)</td>
<td>3.8% (89)</td>
<td>3% (122)</td>
</tr>
<tr>
<td>GDP per capita (PPP)</td>
<td>$51,700 (8)</td>
<td>$40400 (20)</td>
<td>$145,300 (1)</td>
<td>$40,200 (22)</td>
<td>$25,800 (52)</td>
<td>$24,200 (55)</td>
<td>$11,200 (100)</td>
</tr>
<tr>
<td>GDP Composition by sector:</td>
<td></td>
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</tr>
<tr>
<td>Agriculture</td>
<td>0.30%</td>
<td>0.50%</td>
<td>0.10%</td>
<td>0.90%</td>
<td>1.40%</td>
<td>2.70%</td>
<td>11%</td>
</tr>
<tr>
<td>Industry</td>
<td>48.10%</td>
<td>56.60%</td>
<td>78.80%</td>
<td>51.50%</td>
<td>48.20%</td>
<td>61.90%</td>
<td>45.90%</td>
</tr>
<tr>
<td>Services</td>
<td>51.60%</td>
<td>42.90%</td>
<td>21.10%</td>
<td>47.60%</td>
<td>50.30%</td>
<td>35.40%</td>
<td>43.10%</td>
</tr>
<tr>
<td>Labor Force - millions</td>
<td>2.154 (118)</td>
<td>0.6111 (154)</td>
<td>1.254 (137)</td>
<td>3.908 (88)</td>
<td>0.968 (142)</td>
<td>7.337 (62)</td>
<td>25.7 (22)</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>2.2% (18)</td>
<td>15% (148)</td>
<td>0.5% (2)</td>
<td>2.4% (20)</td>
<td>15% (151)</td>
<td>10.8% (119)</td>
<td>14.6% (146)</td>
</tr>
<tr>
<td>Investment (gross fixed) of GDP</td>
<td>13.8% (139)</td>
<td>26.6% (34)</td>
<td>33% (12)</td>
<td>26.8% (33)</td>
<td>26.3% (36)</td>
<td>24.5% (46)</td>
<td>27.6% (28)</td>
</tr>
<tr>
<td>Budget</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue Billions</td>
<td>$64.81</td>
<td>$5.93</td>
<td>$44.62</td>
<td>$65.02</td>
<td>$20.50</td>
<td>$185.10</td>
<td>$105.70</td>
</tr>
<tr>
<td>Expenditure Billions</td>
<td>$38.12</td>
<td>$5.95</td>
<td>$29.69</td>
<td>$60.02</td>
<td>$20.10</td>
<td>$173.10</td>
<td>$98.83</td>
</tr>
<tr>
<td>Public Dept % of GDP</td>
<td>12.6% (121)</td>
<td>59.2% (35)</td>
<td>10.3% (122)</td>
<td>44.6% (61)</td>
<td>4.4% (129)</td>
<td>16.7% (114)</td>
<td>16.2% (117)</td>
</tr>
<tr>
<td>Inflation Rate (Consumer Prices)</td>
<td>3.80%</td>
<td>3.3% (95)</td>
<td>1.1% (25)</td>
<td>2.2% (66)</td>
<td>4% (116)</td>
<td>5.7% (156)</td>
<td>11.8% (207)</td>
</tr>
<tr>
<td>Industrial Production Growth Rate</td>
<td>2.1% (125)</td>
<td>1.5% (138)</td>
<td>27.1% (1)</td>
<td>3.2% (100)</td>
<td>4.5% (74)</td>
<td>3.1% (102)</td>
<td>4.3% (78)</td>
</tr>
<tr>
<td>Current Account Billions</td>
<td>$38.2 (11)</td>
<td>$0.589 (51)</td>
<td>$20.11 (17)</td>
<td>$3.409 (35)</td>
<td>$2.724 (39)</td>
<td>$52.03 (6)</td>
<td>$9.76 (23)</td>
</tr>
<tr>
<td>Export - Billions</td>
<td>$65.03</td>
<td>$15.13 (75)</td>
<td>$57.82 (48)</td>
<td>$195.8 (24)</td>
<td>$36.12 (60)</td>
<td>$235.3 (19)</td>
<td>$78.69 (37)</td>
</tr>
<tr>
<td>Import - Billions</td>
<td>$20.36</td>
<td>$12.14 (85)</td>
<td>$23.38 (66)</td>
<td>$159 (25)</td>
<td>$19.3 (73)</td>
<td>$99.17 (32)</td>
<td>$58.97 (43)</td>
</tr>
<tr>
<td>External Debt - Billions</td>
<td>$56.81 (53)</td>
<td>$14.68 (79)</td>
<td>$71.38 (44)</td>
<td>$122.7 (33)</td>
<td>$8.829 (90)</td>
<td>$82.92 (41)</td>
<td>$12.84 (83)</td>
</tr>
</tbody>
</table>

- Number in ( ) parenthesis is the country rank compared to the world
- 215 World countries considered

(Source: CIA World Factbook 2010)
Oil export revenue accounts for nearly 80% to 90% of total export revenues.

Successful efforts by the UAE at economic diversification have reduced the portion of GDP based on oil and gas output to 25%.
• “The diagnosis presented in the latest Regional Economic Outlook: MENA Sustaining the Recovery in Times of Uncertainty, presented by the World Bank today, suggests that while MENA is recovering, the pace has been less vigorous than the recovery in other developing regions. Growth in the region is expected to average 4% in 2010, an increase of slightly less than 2 percentage points (pp) over growth in 2009 and weak compared to increases of 5.6pp in advanced economies and 4.5pp in developing nations. Only by 2011 and 2012 is MENA’s growth expected to return to the average rates achieved prior to the economic and financial crisis.”

• “The factors constraining the regional recovery are present to different extents in the three major groups of countries in the region – the oil-exporting countries of the Gulf Cooperation Council (GCC), developing oil exporters and the oil importers,”

• “The well-integrated GCC economies (Saudi Arabia, Kuwait, Bahrain, Qatar, United Arab Emirates, and Oman) were hardest hit by the crisis, but they recovered quickly as oil demand rebounded thanks to Asian emerging markets, and as the financial sector stabilized. In 2010 growth has been constrained by weak credit expansion, and by the fact that some GCC countries had to restrain output to support oil prices. In 2010, economic growth for the GCC group is projected at 4.2% – a strong comeback from near zero in 2009. The expectation for 2011 is 5% before a decline to 4.8% in 2012.”

• “All GCC governments continued to stimulate their economies as the global economy started slowing in the second quarter of 2010. Weakness in oil markets due to a global slowdown is the major threat to the recovery in GCC countries, although they have fiscal space to cushion the impact of a negative terms-of-trade shocks.”

• The GCC states have witnessed a rapid economic growth. Oil revenues have been the main source to modernize infrastructure, provide employment opportunities, and attract modern technologies.

• The GCC countries are implementing policy reforms to accelerate non-oil growth, reflecting their political and economic planning for economic diversification. GCC countries have adopted new measures with the aim of attracting foreign investment. The privatization of GCC development plans include achieving sustained economic growth by moving more towards raising private investments, strengthening local technological capabilities to raise efficiency, improving the global competitiveness of their exports in world markets, and creating employment opportunities in the private sectors away from government.

• As a result of a strong rise in oil prices and by an improved investment climate coupled to the economic growth of the MENA states, the GCC foreign direct investments have strongly increased and played a key role in the economic development with the MENA region. Despite the current economic crises, economic growth is forecasted for the GCC states, making them an appealing region for foreign investments.

• The GCC countries are found to be the Lowest Risk in Economic Performance, and third in both the Geopolitical and the Business sectors. The GCC plus Iran contain about 55% of the total world proven crude oil reserves, 41% of the natural gas reserves and provide 28% of the world oil supply.

• To maintain such a standing and possibly enhance them, Security and Stability has to be guaranteed. The U.S. and other Western allies to the GCC are in the process of trying to provide these requirements in the face of the instability caused by Iran’s various actions; in particular its Nuclear Program and Ballistic Missile Program, as well as the lack of any progress in the Palestinian-Israeli Peace negotiations.
GCC Risk Level Compared to other World Economic Regions and Groups

(Source: Strategic Analysis and Global Risk Assessment Center)
GCC States plus Iran

Geopolitical vs Economic - Financial Risk Landscape

(Source: Strategic Analysis and Global Risk Assessment Center - SAGRA)
Competitive Economies of the GCC states plus Iran and World Ranking

(Source: SAGRA adapted from World Economic Forum Global Competitiveness Report 2010 - 2011)
Strait of Hormuz
Oil flow: 15.5 million bbl/day which is roughly 33 percent of all seaborne traded oil (or 17 percent of oil traded worldwide)

Egypt
Oil Supply: 0.3mn bbl/d
Oil Reserve: 3.0 bn bbl

Bab el-Mandab
Oil flow: 3.2 million bbl/day toward Europe, US and Asia

Total World Oil Production 84 million bbl/day (2009)
OPEC and GCC plus Iran as % of World

<table>
<thead>
<tr>
<th></th>
<th>OPEC % of World</th>
<th>Gulf plus Iran % of World</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Oil Proven Reserve</td>
<td>70%</td>
<td>47%</td>
</tr>
<tr>
<td>(billion barrels)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Gas Proven Reserve</td>
<td>50%</td>
<td>41%</td>
</tr>
<tr>
<td>(trillion cu ft)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Oil Supply (million</td>
<td>42%</td>
<td>28%</td>
</tr>
<tr>
<td>barrels/day)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Source: EIA Iran Country Analysis Brief)
Top Proven World Oil Reserves
January 1, 2009 (Billion Barrels)

- Kazakhstan: 30
- Nigeria: 36.2
- Libya: 43.7
- Russia: 60
- UAE: 97.8
- Venezuela: 99.4
- Kuwait: 101.5
- Iraq: 115
- Iran: 136.2
- Canada: 178.1
- Saudi Arabia: 264.2

(Source: EIA Iran Country Analysis Brief)

World Natural Gas Reserves by Country
January 1, 2009 (Trillion Cubic Feet)

- Algeria: 159
- Venezuela: 170.9
- Nigeria: 184.2
- UAE: 214.4
- USA: 237.7
- Saudi Arabia: 258
- Qatar: 891.9
- Iran: 991.6
- Russia: 1680

(Source: EIA Iran Country Analysis Brief)
Iran
Oil & Gas Facilities

Oil export through the Gulf is the economic lifeline for Iran. Any disruptions could be disastrous for the country.

Iran Kharg Island
- Storage Capacity: 20.2 mn bbl
- Loading Capacity: 5 mn bbl/d

Iran Levan Island
- Storage Capacity: 5 mn bbl
- Loading Capacity: 200,000 bbl/d

Kish Island

Iran Crude Refining Capacity
January 1, 2010

<table>
<thead>
<tr>
<th>Refinery</th>
<th>1000 bdl/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abadan</td>
<td>350</td>
</tr>
<tr>
<td>Isfahan</td>
<td>280</td>
</tr>
<tr>
<td>Bandar Abbas</td>
<td>230</td>
</tr>
<tr>
<td>Tehran</td>
<td>220</td>
</tr>
<tr>
<td>Arak</td>
<td>170</td>
</tr>
<tr>
<td>Tabriz</td>
<td>100</td>
</tr>
<tr>
<td>Shiraz</td>
<td>40</td>
</tr>
<tr>
<td>Kermanshah</td>
<td>30</td>
</tr>
<tr>
<td>Lavan Island</td>
<td>30</td>
</tr>
<tr>
<td>Total Existing</td>
<td>1,450</td>
</tr>
</tbody>
</table>

Strait of Hormuz
Oil flow: 16.5 million bbl/day which is roughly 40 percent of all seaborne traded oil (or 20 percent of oil traded worldwide)

(Source: EIA Iran Country Analysis Brief)
The Key Near Term Variable Affecting Deterrence and the Security Landscape:

Iran’s Proliferation of WMD and Ballistic Missiles
Iran Military Doctrine:

- Since Iran presently does not have access to high technology military weapon systems, it will need to develop all ranges of Ballistic Missiles to compensate for its deficiencies in conventional forces.
- Iran has no problem in Strategic Depth, can be an advantage fighting in and over familiar territory. Force Structure Planning based on:
  - High attrition rate inflicted on adversary civilians
  - In depth defenses, as Iran has the strategic depth

Iranian Ballistic Missile arsenal covers:

- SRBM (<1000km)
- MRBM (1,000 to 3,000km)
- IRBM (3,000 to 5,000 km)
- ICBM (>5,000 km such as the Shahab 6)

Tactical Ballistic Missiles Threat:

- Iran’s ballistic missiles cover the complete spectrum range from 150 km up to 5,500 km, the Short, Medium, and Intermediate Ranges of Ballistic Missiles. Iran believes that these will compensate for any deficiencies in its Air Power.
- Ballistic Missiles can be used with success against Soft Targets, in open areas and cities to inflict maximum human casualties and create terror. In essence what is considered as a major component in Asymmetric Warfare in the form of high civilian casualties.
- This arsenal of Ballistic Missiles possessed by Iran has been declared to be for defensive purposes against any foreign invasion, in particular against the U.S.
- However, it has become very clear that it is an arsenal that is intended to inflict maximum casualties and damage, in essence a major component for Asymmetric Warfare in the form of high attrition and defenses in depth and to compensate for any deficiencies in its Air Power.
<table>
<thead>
<tr>
<th>States with Nuclear Weapons</th>
<th>Israel</th>
<th>Pakistan</th>
<th>India</th>
<th>Iran (Potential)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran</td>
<td></td>
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<td></td>
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<tr>
<td>Shahab-1</td>
<td></td>
<td></td>
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<tr>
<td>Shahab-2</td>
<td></td>
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<tr>
<td>Mushak-120</td>
<td></td>
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<tr>
<td>Mushak-160</td>
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<td>Mushak-200</td>
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<tr>
<td>SRBM &lt; 1000 km</td>
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<tr>
<td>MRBM 1,000 – 3,000 km</td>
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<tr>
<td>IRBM 3,000 – 5,500 km</td>
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<tr>
<td>ICBM &gt; 5,500 km</td>
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<tr>
<td>SCUD-B</td>
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<td>SCUD-C</td>
<td></td>
<td></td>
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<tr>
<td>SCUD-D</td>
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<tr>
<td>SS-21b</td>
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<tr>
<td>SRBM &lt; 1000 km</td>
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<tr>
<td>MRBM 1,000 – 3,000 km</td>
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<tr>
<td>IRBM 3,000 – 5,500 km</td>
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<tr>
<td>ICBM &gt; 5,500 km</td>
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<tr>
<td>Hatf I</td>
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<td>Hatf II</td>
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<tr>
<td>Hatf III</td>
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<tr>
<td>M-11</td>
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</tr>
<tr>
<td>SRBM &lt; 1000 km</td>
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<td></td>
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<tr>
<td>MRBM 1,000 – 3,000 km</td>
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<td></td>
</tr>
<tr>
<td>IRBM 3,000 – 5,500 km</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>ICBM &gt; 5,500 km</td>
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</tr>
<tr>
<td>Agni I</td>
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<tr>
<td>Agni II</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Prithvi I</td>
<td></td>
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<tr>
<td>Prithvi II</td>
<td></td>
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</tbody>
</table>

Iran is the only state between the four that has signed and ratified the NPT Treaty.

Iran has been heavily investing in:

- Precision Strike Munitions
- Naval-anti-ship weapons such as the Chinese C802 that hit the Israeli Navy ship during the 2006 war in Lebanon and the Ra’ad 350 km anti-ship missile.
- Ballistic Missiles
- Cruise Missiles such as the Kh55 Russian land attack cruise missile, effective against Oil Platforms.
<table>
<thead>
<tr>
<th>Range (Km)</th>
<th>Class</th>
<th>Burn-out velocity (km/sec)</th>
<th>Boost Phase (sec)</th>
<th>Flight Time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>SRBM</td>
<td>1.0</td>
<td>16</td>
<td>2.7</td>
</tr>
<tr>
<td>500</td>
<td>SRBM</td>
<td>2.0</td>
<td>36</td>
<td>6.1</td>
</tr>
<tr>
<td>1,000</td>
<td>SRBM</td>
<td>2.9</td>
<td>55</td>
<td>8.4</td>
</tr>
<tr>
<td>2,000</td>
<td>MRBM</td>
<td>3.9</td>
<td>85</td>
<td>11.8</td>
</tr>
<tr>
<td>3,000</td>
<td>MRBM</td>
<td>4.7</td>
<td>122</td>
<td>14.8</td>
</tr>
</tbody>
</table>
Iranian Ballistic 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

(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: Missile Sites

(Source:NTI)
(1) Yazd, Saghand, Narigan, Zarigan:
- Mining Uranium Ores
- Milling to produce U3O8 Uranium Oxide (Yellow Cake)

(2) Esfahan Nuclear Technology Center (ENTC):
- Industrial-Scale Uranium Conversion Facility (UCF). The U3O8 is transported to ENTC to convert it to UF6 (Uranium Hexafluoride).
- Natural Uranium is only 0.7% U-235, the fissionable isotope. The other 99.3% is U-238 which is not fissionable.
- The Uranium needs to be enriched between 3 to 5% U-235 to be used in Light Water Reactors.

(3) Natanz:
- Uranium Enrichment. UF6 produced at Esfahan is transported to this facility for enrichment via gas-centrifuge.
- The UF6 is then sent back to a UCF for further processing to produce low-enriched uranium (3 to 5% U-235) used for fuel in light-water nuclear reactors.
- Side Products are: High-Enriched Uranium (90% U-235). Weapons-grade Uranium. At least 15kg needed for a bomb.
- Also Depleted Uranium, mainly U-238, can be produced as a high density metal used in weaponry.

Arak:
- 40 MW(t) Heavy Water Nuclear Reactor. Programmed to be operational by 2011.
- Can produce about 8kg of Plutonium per year, enough for a 20KT nuclear bomb every year.

Bushehr:
- 1000 MW(t) Light Water Reactor for Electric Power production.
- Built by Russia and scheduled to be online in 2009.
- Russia will supply the fuel. Also spent fuel rods to be returned to Russia.
- 3 to 5% U-235 is needed for use as a fuel in light water reactors.
- The Uranium fuel for fission reactors will not make a bomb; it takes enrichment to over 90% necessary for weapons applications.

Tehran Nuclear Research Center (TNRC):
## Amount of Fissile Material needed to build an Atomic Bomb

<table>
<thead>
<tr>
<th>HEU Enriched to 90% U-235</th>
<th>Simple gun-type nuclear weapon</th>
<th>90 to 110 lbs (40 to 50 kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Simple implosion weapon</td>
<td>33 lbs (15 kg)</td>
</tr>
<tr>
<td></td>
<td>Sophisticated implosion Weapon</td>
<td>20 to 26 lbs (9 to 12 kg)</td>
</tr>
<tr>
<td>Plutonium</td>
<td>Simple implosion weapon</td>
<td>14 lbs (6 kg)</td>
</tr>
<tr>
<td></td>
<td>Sophisticated implosion weapon</td>
<td>4.5 to 9 lbs (2 to 4 kg)</td>
</tr>
</tbody>
</table>

- The amount of HEU needed to make a nuclear weapon varies with the degree of enrichment and sophistication of the weapon design.
- In general, the higher the enrichment level, the less HEU is needed to make a bomb.
- For a HEU-based nuclear weapon, there are two basic design options:
  - Gun-type weapon
  - Implosion weapon
    - Gun-type weapons are far simpler in design, whereas the implosion weapon is more difficult technically but requires less HEU
    - Plutonium based nuclear weapons only work as implosion weapons, with more sophisticated weapons using less plutonium.

(Source: Union of Concerned Scientists. Fact Sheet. April 2004)
Iran, the US, and GCC States

Causal Threat Perceptions Interaction Matrix
Iranian threat perceptions:

- Views itself as a Gulf power, its aim to keep the waters free from any foreign military presence.
- Prevent outside countries from shaping the political & security future of the Gulf.
- The occupation of Iraq by U.S. and presence of U.S. 5th fleet in the waters of the Gulf.
- Iran maintains that the U.S. is building bases in the Gulf as launching pads for a strike against it.
- Israel views Iran as an Existential Threat and must be dealt with in the immediate future.
- U.S. and Israel working to destabilize Iran and deny it a Nuclear Energy Program.
- Views itself as a regional power in the Muslim Middle East therefore has a say in any M.E. Peace Process.

Iranian actions dealing with its threat perceptions:

- Diplomatically active to convince GCC States that their security better ensured by signing mutual agreements with it, not US.
- Iran has been stressing that for longer term regional security & stability Iran and GCC states should replace the reliance on foreign military presence and intervention.
- The need to acquire nuclear weapons and long range ballistic missiles as a deterrent, power projection and status.
- Accelerating a program to build a network of Uranium enrichment facilities in case any one of them is destroyed by a U.S. military strike.
- Develop short, medium and long range ballistic missiles to compensate for deficiencies in air power and as a deterrent.
- Building an Asymmetric Warfare capability. Political and Military support to Hezbollah and Hamas.
Iranian National Security Policy:

• Guarantee and Security Assurances that Israel does not strike Iran.
• Put a stop to the Israeli threats to the survival of the Iranian regime.
• Disarming Israel from its Nuclear Weapons capability and its long range Ballistic Missiles.
• The Muslim Arab world to recognize the importance of Iran as a regional power and the key role it plays in the security and stability of the region, and to be treated as such.
• US and Europe to support the construction of Oil and Gas pipeline from the Caspian region through Iran into Afghanistan, Pakistan and India.
• The U.S. to arrange for a defense dialog with Pakistan and India (the two nuclear states neighboring Iran).
• Iran to play a role in the security and stability of Afghanistan. To ensure no emergence of opposition groups in Afghanistan.
• To have access to all developments of Science and Technology in the West.
• To rebuild its conventional armed forces.
• For the U.S. to help in structurally upgrading its oil fields, and guarantee a Nuclear Power program.
U.S. Response:

- The United States recognizes Iran as having sovereign right to peaceful civilian nuclear power, but does not have the right to Nuclear Weapons as stipulated in the Nuclear Non-Proliferation Treaty (NPT).

- To the United States, Iran is in violation of the IAEA safeguards, and the United Nations Security Council Resolutions. These are also becoming the findings of the International Community and Institutions, and not those of the United States alone.

- As a response, the U.S. policy objective has been not to allow the Arabian Gulf region to be dominated by a hegemonic Iran. The United States believes that Iran cannot try to dominate the Gulf region as long as a U.S. military power is present.

- Washington would arm allies in the region, and extend a “defense umbrella”. By extending assistance and a defense umbrella, Iran will not be able to intimidate and dominate its neighboring countries in particular the GCC, as Iran believes it can, once it possesses nuclear weapons.

- President Obama views Russia as an influential partner willing to help fight the proliferation of nuclear weapons mainly in Iran and North Korea. It has become clear that more collaboration between the US and Russia on nuclear non-proliferation could increase pressure on Iran, which has always taken advantage and benefitted from any disagreements between the two countries.
Nuclear Power and Nuclear Proliferation Risks:

• Nuclear Power: Meeting the Global Energy Demand.
Global Electricity demand is expected to increase by more than 50% by 2025. Nuclear power is found to be a primary carbon-free energy source for meeting this extensive global energy expansion.

• Risk: Proliferation and Nuclear Weapons.
The technologies used in peaceful nuclear power programs overlap with those used in the production of fissionable material for nuclear weapons.

• Pathways from Nuclear Power to Proliferation and Nuclear Weapons
  o Theft: Nuclear material is stolen.
  o Sale: Covert sale of nuclear material or enrichment and reprocessing technologies.
  o Diversion: Diverting uranium or spent fuel to a clandestine operation for conversion into weapons grade material.
  o Break Out: NPT signatory state gains nuclear technology or stockpiles of fissile material, then renounces the NPT and pursues nuclear weapons.
General Perceptions of the Iranian threat:

- With occupation of Iraq, Iran now seeks to reemerge as the key power in Arabian Gulf and Muslim M.E. region.
- Nuclear Weapons program that poses as a serious threat to GCC and ME region in addition to the Short, Medium & Long Range Ballistic Missiles program capable of carrying WMD.
- Iran looks upon Nuclear Weapons and Ballistic Missiles as attractive alternatives to expensive modern conventional weapons for Power Projection and Deterrence purposes and as a means to increase status and prestige.
- Opposition to M.E. Process and its rising political influence there.
- Support for Int’l Terrorism; Hezbollah and Hamas as well as Train and Control Insurgency Groups.
- Threat to stability of the Gulf States, has annexed the three Islands that dominate entrance to Straits of Hormuz. Considers itself Central to any Gulf Security Arrangements.
- Building Asymmetric Warfare capability.
**U.S. Position**

- The Obama Administration has been sending messages to Iran trying to dissuade it from pursuing Nuclear Weapons. The message is that the Iranian Nuclear Weapons program will:
  - not advance its security;
  - not achieve its goal of enhancing its power both regionally and globally;
  - spark an arms race in the region;
  - cause Iran to become more insecure.

- The current U.S. position towards Iran is based upon the choice of:
  - Further sanctions and containment if Iran continues its pursuit of Nuclear Weapons or ;
  - Start a dialog with wider economic incentives if it abandons its nuclear weapons program.

- In the event that Iran continues to pursue Nuclear Weapons the U.S. Secretary of State outlined how the U.S. might deal with a such a policy:
  - Washington would arm allies in the region, and extend a “defense umbrella”;
  - Iran possessing nuclear weapons would be unacceptable to the U.S.;
  - Iran crossing the Nuclear Threshold would not make Iran safe;
  - By extending assistance and a defense umbrella, Iran will not be able to intimidate and dominate its neighboring countries in particular the GCC, as Iran believes it can, once it possesses nuclear weapons.
The U.S. administration is furthermore pursuing all means available:

- To influence Iranian policy and promote a more positive nature of the regime. Move from a Confrontational to a Cooperative foreign policy.
- Iranian Military Posture to be more Defensive than Offensive.
- Open all facilities for IAEA inspection in particular the Uranium Enrichment Facilities.
- Iran to stop arming Hezbollah and Hamas, and actually play a role in disarming Hezbollah.
- Destroy all Long Range Ballistic Missiles that are a threat to the Arab GCC countries and the region.
- Start Confidence & Security Building Measures with the Arabian Gulf States.
- Iran to find a peaceful solution in withdrawing from the three UAE islands in the Gulf waters that it occupied.
- Start a dialog with the M.E. region including Israel on the establishment of a WMDFZ and other forms of Arms Control.
- Support the Israeli-Syrian Peace Negotiations based on UNSCR 242 & 338.
- Join the Arab countries in supporting a peaceful solution to the Palestinian-Israeli negotiations and the two state solution.
- Support the US in Iraq, especially the Shia Groups and for them not to attack U.S personnel.
- Support the U.S. in Afghanistan by not supporting the Taliban or other Insurgency groups.
- Support the U.S. in the war against Terrorism and in particular Al-Qaida.
GCC Response:

- The Arab Gulf states have been investing heavily in the modernization and upgrading of their force structures. The United States, France and United kingdom have been the major weapons suppliers.
- They also recognize that the assistance of outside regional powers will be required to deal with any military aggression in the region. As a result they have signed bilateral defense agreements with their Western allies - United States, Britain and France. In 2002 the GCC made a major security shift from a Common Security arrangement to a Joint Defense Pact which essentially is a Collective Security arrangement.
- Agreement entails a commitment by each member to join the coalition and if one is attacked that implies an attack on the other partners. This being based either on defense in its traditional sense, or upon deterrence.
- The GCC has to plan its defenses so as to deter Iran or any other adversary. What they can do is to build their collective and national assets so as to provide a military deterrent sufficient to make any direct confrontation as costly as possible to Iran or any other adversary. It is in this deterrent role that lies the ultimate rationale for any GCC Joint Defense Pact and Cooperation.
- Two main considerations underlying the choice of a Military Doctrine by the GCC states have been: Balance of Forces and Strategic Depth. In particular for the Arabian Gulf “front line states” Kuwait, Bahrain, Qatar, UAE and Oman, the main concern would be strategic depth to an Iranian attack.
- Lack of Strategic Depth results in limitations on the area of operational maneuverability during conflict, time to respond, and an increase in the vulnerability of vital strategic economic centers due to the proximity to the borders. Saudi Arabia would be the only state that has strategic depth.
- When transformed into an operational doctrine, the GCC states would base their Force Structure Planning on:
  - Defensible Borders. Borders which can be defended without a pre-emptive initiative.
  - In parallel the capability to take the war to the enemy, fight on enemy territory.
GCC Capabilities to Deter and Defend: Military Forces & Order of Battle
Air Bases and Air Force Order of Battle (2009)

<table>
<thead>
<tr>
<th>Country</th>
<th>Combat A/C</th>
<th>Attack Helo’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran</td>
<td>319</td>
<td>95</td>
</tr>
<tr>
<td>Iraq</td>
<td>-</td>
<td>37</td>
</tr>
<tr>
<td>Kuwait</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>Bahrain</td>
<td>33</td>
<td>16</td>
</tr>
<tr>
<td>Qatar</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>UAE</td>
<td>184</td>
<td>67</td>
</tr>
<tr>
<td>Oman</td>
<td>64</td>
<td>41</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>278</td>
<td>67</td>
</tr>
<tr>
<td>Yemen</td>
<td>79</td>
<td>18</td>
</tr>
</tbody>
</table>

Iran Airbases

- **Tabriz**: F-5E/F, MiG-29
- **Hamadan**: F-4E/D Su-24
- **Dezful**: F-5E/F Su-24
- **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

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)

Air Bases Source: Global Security.org
### High Quality Combat Aircraft (2010)

<table>
<thead>
<tr>
<th>Combat Aircraft</th>
<th>Total Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typhoon</td>
<td>4</td>
</tr>
<tr>
<td>Tomado ADV</td>
<td>15</td>
</tr>
<tr>
<td>Tomado IDS</td>
<td>85</td>
</tr>
<tr>
<td>Mirage 2000</td>
<td>74</td>
</tr>
<tr>
<td>MiG-29</td>
<td>18</td>
</tr>
<tr>
<td>MiG-25</td>
<td>0</td>
</tr>
<tr>
<td>Su-25</td>
<td>13</td>
</tr>
<tr>
<td>Su-24</td>
<td>30</td>
</tr>
<tr>
<td>Su-20/22</td>
<td>30</td>
</tr>
<tr>
<td>F-18</td>
<td>39</td>
</tr>
<tr>
<td>F-16</td>
<td>21</td>
</tr>
<tr>
<td>F-15S</td>
<td>70</td>
</tr>
<tr>
<td>F-15C/D</td>
<td>84</td>
</tr>
<tr>
<td>F-14</td>
<td>44</td>
</tr>
<tr>
<td>F-4D/E</td>
<td>65</td>
</tr>
<tr>
<td>Saegheh</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>39 21 12 147 12 258 43 190</td>
</tr>
</tbody>
</table>

(Source: Anthony Cordesman CSIS)
## GCC Airforce Tactical Fighter Capabilities - 2009

<table>
<thead>
<tr>
<th>Type</th>
<th>Order of Battle</th>
<th>Operational Ready %</th>
<th>Force Available</th>
<th>Force Sorties per Day</th>
<th>Postulated Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tornado IDS</td>
<td>Saudi Arabia: 25</td>
<td>75</td>
<td>19</td>
<td>57</td>
<td>Deep Strike</td>
</tr>
<tr>
<td>Tornado ADV</td>
<td>Saudi Arabia: 85</td>
<td>75</td>
<td>64</td>
<td>192</td>
<td>FS, BAS, AD, Escort</td>
</tr>
<tr>
<td>F-18</td>
<td>Kuwait: 39</td>
<td>75</td>
<td>29</td>
<td>87</td>
<td>FS, BAS, AD, Escort, CAS, BI, SEAD</td>
</tr>
<tr>
<td>F-15C/D</td>
<td>Saudi Arabia: 84</td>
<td>75</td>
<td>63</td>
<td>189</td>
<td>FS, BAS, AD, Escort, CAS, BI</td>
</tr>
<tr>
<td>F-15S</td>
<td>Saudi Arabia: 71</td>
<td>75</td>
<td>53</td>
<td>160</td>
<td>Deep Strike, FS, AD, Escort, CAS, BI</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>491</strong></td>
<td><strong>368</strong></td>
<td><strong>1,105</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FS: Fighter Sweep, BAS: Battlefield Air Superiority, AD: Air Defense, CAS: Close Air Support (Air to Ground Role), BI: Battle Field Interdiction (Air to Ground Role), SEAD: Suppression of Enemy Air Defense

Sustained Conditions: 12 hr Operational Day  
18 hr Maintenance Day  
3 Sorties per aircraft per day
<table>
<thead>
<tr>
<th>Type</th>
<th>No</th>
<th>Operational Readiness (%)</th>
<th>Force Available</th>
<th>Total Sortie Per Day</th>
<th>Postulated Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>MiG-29A</td>
<td>25</td>
<td>60</td>
<td>15</td>
<td>30</td>
<td>Air Defense/Escort/FS/BAS</td>
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<tr>
<td>Su-25</td>
<td>13</td>
<td>60</td>
<td>8</td>
<td>16</td>
<td>CAS/BI/Deep Strike</td>
</tr>
<tr>
<td>SU-24</td>
<td>30</td>
<td>60</td>
<td>18</td>
<td>36</td>
<td>CAS/BI/Deep Strike</td>
</tr>
<tr>
<td>F-14</td>
<td>25</td>
<td>60</td>
<td>15</td>
<td>30</td>
<td>Air Defense/FS CAS/BI/Deep</td>
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<td>F-4E/D</td>
<td>65</td>
<td>69</td>
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<td>78</td>
<td>Strike/SEAD</td>
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<td>Total</td>
<td>158</td>
<td></td>
<td>95</td>
<td>190</td>
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</tr>
</tbody>
</table>

BAS: Battlefield Air Superiority  
CAS: Close Air Support  
BI: Battlefield Interdiction  
DS: Defense Suppression  
FS: Fighter Sweep

Sustained Conditions: 12 hr Operational Day  
18 hr Maintenance Day  
2 Sorties per Aircraft per day
Air to Ground Ranges of GCC Aircraft
Hi-Lo-Lo-Hi Profile
(External Fuel Tanks Dropped on Combat)

• Tornado IDS/F-15 Launched from King Abdulaziz Air Base
• F-16C/Mirage 2000 Launched from UAE

Mirage 2000 - 620 nmi
F-16C - 720 nmi
F-15 - 600 nmi
Tornado IDS - 750 nmi

2 Mk84 (4,000 lbs) Payload
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
### AWACS & Reconnaissance Aircraft (2010)

<table>
<thead>
<tr>
<th>AWACS Recce</th>
<th>Kuwait</th>
<th>Bahrain</th>
<th>Qatar</th>
<th>UAE</th>
<th>Oman</th>
<th>Saudi Arabia</th>
<th>Yemen</th>
<th>Iran</th>
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<td>P-F3 Orion</td>
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<td>10</td>
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<td>5</td>
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<tr>
<td>P-3MP Orion</td>
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<td></td>
</tr>
<tr>
<td>Tomado IDS</td>
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<td></td>
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<td>E-3A AWACS</td>
<td>5</td>
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<td>10</td>
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<td>Mirage 200...</td>
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<td>RF-4E</td>
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<td>SB7L-360</td>
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<td>Cessna 208B</td>
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<td>CH-2000</td>
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<td>15</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td>39</td>
<td></td>
</tr>
</tbody>
</table>

(Source: Anthony Cordesman CSIS)
Navy Combat Ships (2010)

(Source: Anthony Cordesman CSIS)
## Gulf Land-Based Air Defense Systems in 2008

<table>
<thead>
<tr>
<th>Country</th>
<th>Major SAM</th>
<th>Light SAM</th>
<th>AA Gun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain</td>
<td>(8) IHAWK</td>
<td>(60) RBS-70 (18) FIM 92A Stinger (7) Crotale</td>
<td>(26) Guns (15) Oerlikon 35mm (12) L/70 40mm</td>
</tr>
<tr>
<td>Iran</td>
<td>(16/150) IHAWK</td>
<td>SA-7/14/16 HQ-7 (29) SA-15; Some QW-1 Misaq (29) TOR-M1; Some HN-5 (30) Rapier; Some FM-80 (Ch Crotale) 15 Tigercat; Some FIM-92A Stinger</td>
<td>(1,700) Guns (4) ZU-23-2 23mm (10) GDF-(x)5 Skyguard 35mm (12) L-60 40mm</td>
</tr>
<tr>
<td>Kuwait</td>
<td>(4/24) IHAWK Phase III</td>
<td>(6/12) Aspide (48) Starbust</td>
<td>12 Oerlikon 35mm</td>
</tr>
<tr>
<td>Oman</td>
<td>None</td>
<td>Blowpipe; (2) Mistral SP (34) SA-7; (6) Blindfire (20) Javelin; (40) Rapier S713 Martello</td>
<td>(26) Guns (4) ZU-23-2 23mm (10) GDF-(x)5 Skyguard 35mm (12) L-60 40mm</td>
</tr>
<tr>
<td>Qatar</td>
<td>None</td>
<td>(10) Blowpipe (12) FIM-92A Stinger (9) Roland II (24) Mistral (20) SA-7</td>
<td></td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>(16/128) IHAWK</td>
<td>(40) Crotale (500) Stinger (ARMY) (500) Mistral (ADF) (500) FIM-43 Redeye (ARMY) (500) Redeye (ADF) (73-141) Shahine Static (500) FIM-92A Stinger (ARMY) (400) FIM-92A Avenger (ADF)</td>
<td>(1,220) Guns (92) M-163 Vulcan 20mm (30) N-167 Vulcan 20mm (NG) (850) AMX-30SA 30mm (128) GDF Oerlikon 35mm (150) L-70 40mm (store) (130) M-2 90mm (NG)</td>
</tr>
<tr>
<td>UAE</td>
<td>(2/31) IHAWK</td>
<td>20+ Blowpipe (20) Mistral Some Rapier/Crotale/ RB-70/Javelin/SA-18</td>
<td>(62) Guns (42) M-3VDA 20mm SP (20) GCF-BM2 30mm</td>
</tr>
</tbody>
</table>

(Source: Iranian Weapons of Mass Destruction. Anthony Cordesman SCIS)
## Medium to Long Range Surface To Air Missile Systems

<table>
<thead>
<tr>
<th>Air Defense System</th>
<th>Associated Early Warning/Acquisition Radars</th>
<th>Associated Tracking &amp; Guidance Radars</th>
<th>Missile Ranges (km)</th>
<th>In Service Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA-2</td>
<td>Spoon Rest D (P-18) Flat Face A (P-15)</td>
<td>Fansong A/B</td>
<td>Max (km): 40, Min (km): 8, Altitude (ft): 3,000 to 90,000</td>
<td>1971 Upgraded</td>
</tr>
<tr>
<td>SA-3</td>
<td>Flat Face B (P-19) Squat Eye</td>
<td>Low Blow</td>
<td>Max (km): 30, Min (km): 6, Altitude (ft): 150 to 160,000</td>
<td>1971</td>
</tr>
<tr>
<td>SA-6</td>
<td>Long Track (P-40) Height Finder: Thin Skin B (PRV-9)</td>
<td>Straight Flush</td>
<td>Max (km): 24, Min (km): 4, Altitude (ft): 50 to 45,000</td>
<td>1973</td>
</tr>
<tr>
<td>SA-8</td>
<td>Flat Face B (P-19) Long Track (P-40) Height Finder: Thin Skin B (PRV-9)</td>
<td>Land Roll</td>
<td>Max (km): 15, Min (km): 0.2, Altitude (ft): 40 to 40,000</td>
<td>1982</td>
</tr>
<tr>
<td>SA-5</td>
<td>Back Trap (P-80) Tall King C (P-14) Spoon Rest D (P-18) Height Finder: Odd pair (PRV-13) Odd Group (PRV-16)</td>
<td>Square Pair</td>
<td>Max (km): 250, Min (km): 20, Altitude (ft): 1,500 to 130,000</td>
<td>1983</td>
</tr>
<tr>
<td>IHAWK</td>
<td>AN/MPQ-50, AN/MPQ-55 (PIP II)/62 (PIP III) Range only Radar</td>
<td>AN/MPQ-57 (PIP II)/61 (PIP III)</td>
<td>Max (km): 35, Min (km): 3, Altitude (ft): 0 to 55,000 ft</td>
<td>1971</td>
</tr>
<tr>
<td>Patriot PAC-2</td>
<td>AN/MPQ-53 Phased-Array Radar Carries out Search, target detection, track and identification, missile tracking and ECCM functions</td>
<td>AN/MSQ-104 Engagement Control Station (ECS)</td>
<td>Max (km): 70, Min (km): 3, Altitude (ft): 80,000</td>
<td>1990</td>
</tr>
</tbody>
</table>
WEAKNESS IN THE OPERATIONAL PERFORMANCE OF THE IRANIAN AIR FORCE

- Long C4I Early Warning delay time due to antiquated System, semi-automated man in the loop.
- Long Response / Scramble Time by Combat Aircraft
- Low Operational Readiness Rate of Combat Aircraft
  - Need Improvement in maintenance operations
  - Need Improvement in supply of spare parts
- Low Combat Aircraft Sortie Rates, Sustained and Surge.
- Centralized Battle Management

IRAN’S CURRENT AIR/MISSILE DEFENSES

- U.S. never delivered integrated system before fall of Shah.
- Only modern short-range point defense system is TOR-M.
- Other short-range systems mix of older Russian system, SHORADs, and aging – possible inactive British and French systems.
- Medium to long-range systems are low capability or obsolescent.
- HAWKS and IHAWKs do not have capable ECM. Date back to 1960s and 1970s.
- Various versions of SA-2 obsolete.
- Radar sensor and battle management/C4I systems have major limitations.
- Less than 30 export versions of MiG-29, some not operational.
- F-14s do not have ability to use primary air defense missile since 1979-1980.

The Role of the US in Gulf Stability and Security:

Deterrent and Strike Options
US Extended Deterrence against the proliferation of WMD and their delivery systems – Ballistic Missiles.

- The main two cases are North Korea and Iran. North Korea with its arsenal of Nuclear Weapons and Ballistic Missiles is a direct threat to Japan and South Korea. Whereas Iran with its ballistic missiles and potential of developing a nuclear weapon is a direct threat to the GCC and also poses a threat to all friends and allies in the Middle East region. The U.S. has not managed so far to stop these two countries from acquiring a nuclear capability to develop nuclear weapons.

- Iran has ignored all of the U.S. warnings similar to that of North Korea, and Iran has pressed ahead with its uranium enrichment program and has recently announced that it is totally “self-sufficient” in nuclear technology. Iran claims that it can domestically produce its own raw uranium for enrichment.

- U.S. extended deterrence have been statements that the full range of U.S. military capability in both conventional and unconventional weapons will be available and ready to be committed to defend its allies and friends against any threat. The U.S. should start implementing a strategy to influence the decision making bodies in Iran as to the devastating consequences if the GCC and any other allies are attacked or threatened.

- Should deterrence fail, the U.S. should have already provided the GCC countries with Ballistic Missile Defense Systems with all the Early Warning and Command Control facilities, that will limit the damage should they be attacked, and to enhance the conventional deterrence capability of the GCC. In addition providing modern technology combat aircraft that can be launched within a very short window of time to block any first attack wave and to have the capability to quickly move the war into enemy territory, using both Defensive and Offensive Counterair Missions.

- The U.S. should work with the GCC and its allies in the region in defining “redlines” that if crossed by Iran, then what economic and military response will the U.S. take.
US DETERRENT AND STRIKE OPTIONS

Counter-Proliferation:
- The U.S. is the only country that can launch a successful Military Strike, if all peaceful options have been exhausted and Iran has left no other means to convince it to stop or change its course in pursuing Nuclear Weapons, The U.S. should alone determine what the timeline could be if Iran does pursue the path to develop nuclear weapons.

Two possible outcomes:
- U.S. launches a highly successful military strike against Iran’s Nuclear facilities however knowing very well that the action of a military strike could be very destabilizing for the entire Middle East region, with an Iranian military response.
- U.S. does not launch a military strike but finally decides it could be willing to live with a nuclear Iran.

Regional Implications in accepting Iran as a Nuclear State, or as a “Nuclear Threshold State”:
- Strengthen Iran as a regional power in the region leading Iran to demand that it has a say in any Political and Security Arrangements in the Arab Gulf Region, Iraq, Afghanistan and the Middle East Peace Process.
- Increase the dangers of and Arms Race and Weapons of Mass Destruction Proliferation in the Middle East region.
- The U.S. will need to deprive Iran of any advantages it hopes to gain by possessing nuclear weapons by:
  o Having a more active political and military role in the region
  o Providing more defense assistance to the states in the region
  o Extend a nuclear deterrent regime to the region, in the hope that this negates the need for the Arab countries to acquire any form of weapons of mass destruction.
  o Increase sanctions regime on Iran to increase the costs of developing and possessing nuclear weapons.
US MILITARY STRIKE OPTIONS: DEMONSTRATIVE, COERCIVE, OR DETERRENT STRIKES

• Conduct a few cruise missile or stealth strikes simply as a demonstration or warning of the seriousness of U.S. intentions if Iran does not comply with the terms of the EU3 or UN.

• Hit at least one high-value target recognized by the IAEA and EU3 to show credibility to Iran, minimize international criticism.

• Might strike at new sites and activities to show Iran cannot secretly proceed with, or expand its efforts, by ignoring the UN or EU3.

• Could carrier base; would not need territory of Gulf ally.

• International reaction would be a problem regardless of the level of U.S. action.

• Might trigger Iranian counteraction in Iraq, Afghanistan, and dealing with Hezbollah.
US MILITARY STRIKE OPTIONS: LIMITED US ATTACKS

• A limited strike would probably take 16-20 cruise missile and strike sorties. (Total sorties in the Gulf and the area would probably have to total 100 or more including escorts, enablers, and refuelers.)

• Might be able to combine B-2s and carrier-based aircraft and sea-launched cruise missiles. Might well need land base(s) in the Gulf for staging, refueling, and recovery.

• Goal would be at least 2-3 of the most costly and major facilities critically damaged or destroyed.

• Hit at high-value targets recognized by the IAEA and EU3 to show credibility to Iran, minimize international criticism.

• Might strike at new sites and activities to show Iran cannot secretly proceed with, or expand its efforts, by ignoring the UN or EU.

• Might slow down Iran if used stealth aircraft to strike at hard and underground targets, but impact over time would probably still be more demonstrative than crippling.

• Hitting hard and underground targets could easily require multiple strikes during mission and follow-on restrikes to be effective.

• Battle damage would be a significant problem, particularly for large buildings and underground facilities.

• Size and effectiveness would depend very heavily on the quality of U.S. intelligence, and suitability of given ordnance, as well as the time the United States sought to inflict a given effect.

• Iran's technology base would survive; the same would be true of much of the equipment even in facilities hit with strikes. Little impact, if any, on pool of scientists and experts.

• Iranian response in terms of proliferation could vary sharply and unpredictably: deter and delay versus mobilize and provoke.

• Likely to produce cosmetic Iranian change in behavior at best. Would probably make Iran disperse program even more and drive it to deep underground facilities. Might provoke to implement (more) active biological warfare program.

• Any oil embargo likely to be demonstrative.

• Would probably trigger Iranian counteraction in Iraq, Afghanistan, and dealing with Hezbollah.

• International reaction could be a serious problem; United States might well face same level of political problems as if it had launched a comprehensive strike on Iranian facilities.
US MILITARY STRIKE OPTIONS: MAJOR U.S. ATTACKS ON IRANIAN CBRN AND MAJOR MISSILE TARGETS - I

• Period of attacks could extend from three to ten days with 200-600 cruise missiles and strike sorties; would have to be at least a matching number of escorts, enablers, and refuelers.

• Hit all suspect facilities for nuclear, missile, BW, and related C4IBM.

• Knock out key surface-to-air missile sites and radars for future freedom of action

• Would need to combine B-2s, carrier-based aircraft, and sea-launched cruise missiles and use land base(s) in Gulf for staging, refueling, and recovery.

• Threaten to strike extensively at Iranian capabilities for asymmetric warfare and to threaten tanker traffic, facilities in the Gulf, and neighboring states.

• Would take at least seven to ten days to fully execute and validate.

• Goal would be at least 70-80 percent of the most costly and major facilities critically damaged or destroyed.

• Hit at all high value targets recognized by the IAEA and EU3 to show credibility to Iran, minimize international criticism, but also possible sites as well.

• Strike at all known new sites and activities to show Iran cannot secretly proceed with, or expand its efforts, unless hold back some targets as hostages to the future.

• Impact over time would probably be crippling, but Iran might still covertly assemble some nuclear device and could not halt Iranian biological weapons effort.

• Hitting hard and underground targets could easily require multiple strikes during mission and follow-on restrikes to be effective.

• Battle damage would be a significant problem, particularly for large buildings and underground facilities.

• Size and effectiveness would depend very heavily on the quality of U.S. intelligence and suitability of given ordnance, as well as the time the United States sought to inflict a given effect.
US MILITARY STRIKE OPTIONS: MAJOR U.S. ATTACKS ON IRANIAN CBRN AND MAJOR MISSILE TARGETS - II

- Much of Iran's technology base would still survive; the same would be true of many equipment items, even in facilities hit with strikes. Some impact, if any, on pool of scientists and experts.
- Iranian response in terms of proliferation could vary sharply and unpredictably: deter and delay versus mobilize and provoke.
- A truly serious strike may be enough of a deterrent to change Iranian behavior, particularly if coupled to the threat of follow-on strikes in the future. It still, however, could as easily produce only a cosmetic Iranian change in behavior at best. Iran might still disperse its program even more and shift to multiple, small, deep underground facilities.
- Might well provoke Iran to implement (more) active biological warfare program.
- An oil embargo might be serious.
- Iranian government could probably not prevent some elements in Iranian forces and intelligence from seeking to use Iraq, Afghanistan, support of terrorism, and Hezbollah to hit back at the United States and its allies if it tried; it probably would not try.
- International reaction would be a serious problem, but the United States might well face the same level of political problems as if it had launched a small strike on Iranian facilities.
US MILITARY STRIKE OPTIONS: MAJOR U.S. ATTACKS ON MILITARY AND RELATED CIVILIAN TARGETS - I

- Would take 1,000-2,500 cruise missiles and strike sorties
- Hit all suspect facilities for nuclear, missile, BW, and C4IBM, and potentially “technology base” targets including universities and dual-use facilities.
- Either strike extensively at Iranian capabilities for asymmetric warfare and to threaten tanker traffic, facilities in the Gulf, and neighboring states or threaten to do so if Iran should deploy for such action.
- Would require a major portion of total U.S. global assets. Need to combine B-2s, other bombers, and carrier-based aircraft and sea-launched cruise missiles. Would need land base(s) in the Gulf for staging, refueling, and recovery. Staging out of Diego Garcia would be highly desirable.
- Would probably take several weeks to two months to fully execute and validate.
- Goal would be 70-80-percent-plus of the most costly and major CBRN, missile, and other delivery systems, key conventional air and naval strike assets, and major military production facilities critically damaged or destroyed.
- Hit at all high-value targets recognized by the IAEA and EU3 to show credibility to Iran, minimize international criticism, but also possible sites as well.
- Strike at all known new sites and activities to show Iran cannot secretly proceed with, or expand its efforts, unless hold back some targets as hostages to the future.
- Hitting hard and underground targets could easily require multiple strikes during mission and follow-on restrikes to be effective.
- Impact over time would probably be crippling, but Iran might still covertly assemble some nuclear device and could not halt Iranian biological weapons effort.
- Battle damage would be a significant problem, particularly for large buildings and underground facilities.
US MILITARY STRIKE OPTIONS: MAJOR U.S. ATTACKS ON IRANIAN CBRN AND MAJOR MISSILE TARGETS - II

- Size and effectiveness would depend very heavily on the quality of U.S. intelligence and suitability of given ordnance, as well as the time the United States sought to inflict a given effect.

- Much of Iran's technology base would still survive; the same would be true of many equipment items, even in facilities hit with strikes. Some impact, if any, on pool of scientists and experts.

- Iranian response in terms of proliferation could vary sharply and unpredictably: deter and delay versus mobilize and provoke.

- Such a series of strikes might be enough of a deterrent to change Iranian behavior, particularly if coupled to the threat of follow-on strikes in the future. It still, however, could as easily produce only a cosmetic Iranian change in behavior at best. Iran might still disperse its program even more, and shift to multiple, small, deep underground facilities.

- Might well provoke Iran to implement (more) active biological warfare program.

- An oil embargo might be serious.

- Iranian government could probably not prevent some elements in Iranian forces and intelligence from seeking to use Iraq, Afghanistan, support of terrorism, and Hezbollah to hit back at the United States and its allies if it tried; it probably would not try.

- International reaction would be a serious problem, and far greater than strikes that could be clearly associated with Iran's efforts to proliferate.
US MILITARY STRIKE OPTIONS: DELAY AND THEN STRIKE

• The United States could execute any of the above options and wait until after Iran provided proof it was proliferating. Such a “smoking gun” would create a much higher chance of allied support, and international tolerance or consensus.

• Iran will have committed major resources and created much higher value targets.

• The counter-risk is an unanticipated Iranian breakout: some form of Iranian launch on warning, launch under attack, or survivable “ride out” capability.

• Iranian dispersal and sheltering may be much better.

• Iran might have biological weapons as a counter.

• Allied and regional reactions would be uncertain. Time tends to breed tolerance of proliferation.
US MILITARY STRIKE OPTIONS: RIDE OUT IRANIAN PROLIFERATION:

• Announce or quietly demonstrate U.S. nuclear targeting of Iran's military and CBRN facilities and cities.
• Tacitly signal U.S. “green light” for Israeli nuclear retaliation or preemption.
• Deploy anti-ballistic and cruise missile defenses, and sell to Gulf and neighboring states.
• Signal U.S. conventional option to cripple Iran by destroying its power generation, gas, and refinery facilities.
• Provide U.S. guarantees of extended deterrence to Gulf States.
• Tacitly accept Saudi acquisition of nuclear weapons.
• Maintain preventive/preemptive option at constant combat readiness. Act without warning.
• Encourage Israel to openly declare its strike options as a deterrent.
• Announce doctrine that any Iranian use of biological weapons will lead to nuclear retaliation against Iran.
The Israeli Wild Card:

Deterrent and Strike  Assets and Capabilities
Main Airbases

Hatzerim:
- F-15l
- F-16l

Hatzor:
- F-16C/D
- F-16A/B

Ben Gurion:
- KC-130H
- B-707

Ovda:
- F-16A/B
- F-16l

Ramat David:
- F-16C/D

Ramon:
- F-16l

Tel Nof:
- F-15A/B
- F-15C/D
- F-15I
- F-16A/B
- F-16C/D

(Source:GlobalSecurity.org)
The U.S. approved the sale of 25 F-35 Joint Strike Aircraft with an option for 50 more in coming years, for a value of $15.2 billion. It was reported that Israel wants to buy an initial 25 F-25s in the Conventional Take-Off and landing (CTOL) configuration. – Haretz Daily Newspaper, Israel
## Israeli Airforce Tactical Fighter Capabilities

<table>
<thead>
<tr>
<th>Type</th>
<th>Order of Battle</th>
<th>Operational Ready %</th>
<th>Force Available</th>
<th>Sustained Sortie Rate</th>
<th>Sorties per Day</th>
<th>Postulated Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-15I</td>
<td>25</td>
<td>80</td>
<td>20</td>
<td>3.0</td>
<td>60</td>
<td>Deep Strike</td>
</tr>
<tr>
<td>F-15C/D</td>
<td>28</td>
<td>80</td>
<td>22</td>
<td>3.0</td>
<td>67</td>
<td>FS, BAS, AD, Escort</td>
</tr>
<tr>
<td>F-15A/B</td>
<td>34</td>
<td>80</td>
<td>27</td>
<td>3.0</td>
<td>82</td>
<td>FS, BAS, AD, Escort</td>
</tr>
<tr>
<td>F-16C/D</td>
<td>129</td>
<td>80</td>
<td>103</td>
<td>3.0</td>
<td>310</td>
<td>FS, BAS, AD, Escort, CAS, BI, SEAD</td>
</tr>
<tr>
<td>F-16A/B</td>
<td>106</td>
<td>80</td>
<td>85</td>
<td>3.0</td>
<td>254</td>
<td>BAS, AD, Escort, CAS, BI</td>
</tr>
<tr>
<td>F-16I</td>
<td>102</td>
<td>80</td>
<td>82</td>
<td>3.0</td>
<td>245</td>
<td>Deep Strike</td>
</tr>
<tr>
<td>Total</td>
<td>424</td>
<td>339</td>
<td></td>
<td></td>
<td>1018</td>
<td></td>
</tr>
</tbody>
</table>

**FS:** Fighter Sweep, **BAS:** Battlefield Air Superiority, **AD:** Air Defense,  
**CAS:** Close Air Support (Air to Ground Role), **BI:** Battle Field Interdiction (Air to Ground Role)  
**SEAD:** Suppression of Enemy Air Defense

Sustained Conditions: 12 hr **Operational** Day  
18 hr Maintenance Day
Israel launched a Jericho II missile across the Mediterranean that landed about 250 miles north of Benghazi, Libya. The missile flew over 800 miles, and U.S. experts felt it had a maximum range of up to 900-940 miles (1,450 kilometers), which would allow the Jericho II to cover virtually all of the Arab world.

The most recent version of the missile seems to be a two-stage, solid-fuel propellant with a range of up to 900 miles (1,500 kilometers) with a 2,200 pound payload.

There are reports that Israel is developing a Jericho III missile, based on a booster it developed with South Africa in the 1980s. Jane’s estimated that the missile has a range of up to 5,000 kilometers and a 1,000-kilogram warhead. This estimate is based largely on a declassified Defense Intelligence Agency estimate of the launch capability of the Shavit booster that Israel tested on September 19, 1988.

<table>
<thead>
<tr>
<th>System</th>
<th>Class</th>
<th>Payload</th>
<th>Warhead</th>
<th>Range (km)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jericho I</td>
<td>Short RangeBallistic Missile (SRBM)</td>
<td>Single Warhead</td>
<td>450 kg; Nuclear 20KT; HE</td>
<td>500 km</td>
<td>Obsolete</td>
</tr>
<tr>
<td>Jericho II</td>
<td>Medium Range Ballistic Missiles (MRBM)</td>
<td>Single Warhead</td>
<td>Nuclear 1MT; HE</td>
<td>1500 km</td>
<td>Operational since 1990</td>
</tr>
<tr>
<td>Jericho III</td>
<td>Intercontinental Range Ballistic Missile</td>
<td>Single Warhead</td>
<td>750 Kg</td>
<td>4800 – 6500 km</td>
<td>Development Stage, Expected Service 2008</td>
</tr>
</tbody>
</table>

GCC, International, US and Israeli Deterrent and Strike Options to dealing with Iran’s Nuclear/Missile Programs
COMBATING PROLIFERATION OF WMD AND BMS

• **Non-Proliferation:**
  Political, Economic and Diplomatic actions taken to prevent Proliferation by dissuading or impeding access to or distribution of WMD and Ballistic Missile technology, material and expertise.

   Treaties & Agreements:
   NPT, CWC, BWC, MTCR, CTBT, NSG, WMDFZ, IAEA Safeguards, Export Controls, Arms Control Measures, Conflict Management/Resolution & Prevention.

• **Counter-Proliferation:**
  Counter-Proliferation is “the full range of military activities” that will “deter, identify, deny, and counter adversary development, acquisition, possession, proliferation and use of WMD and Ballistic Missiles”.

I. **Extended Deterrence** which is an attempt to prevent a military attack against an ally by threatening retaliation using conventional or unconventional weapons.

II. **Active Defense** is preventing the delivery of an adversary’s WMD via Ballistic Missiles. This is the detection and destruction of a weapon once it has been fired.

III. **Counterforce** is offensive military operations taken to eliminate the threats by denying an adversary the asset. Counterforce includes interdicting, seizing securing and/or destroying an adversary’s WMD and related infrastructure.

IV. **Passive Defense** is measures taken to reduce the vulnerability of friendly personnel and assets to WMD effects basically the NBC defense programs.
OPTIONS IN DEALING WITH IRAN’S NUCLEAR PROGRAM

Non-Proliferation
- **Diplomacy and Dialog:**
  Efforts to persuade Iran to not proliferate, and by convincing Iran that it does not face a sufficient threat to proliferate and cannot make major gains in power or security by doing so.
- **Incentives:**
  Options that give Iran security guarantees, economic and trade advantages.
- **Containment:**
  Creation of a mix of defensive and offensive measures that would both deny Iran the ability to exploit its WMD capabilities and show that any effort to use such weapons to intimidate or gain military advantage would be offset by the response.
- **Sanctions:**
  Controls and measures designed to put economic pressure on Iran, limit its access to technology, and/or limit its access to arms.
- **Regime change:**
  Efforts to change the regime and create one that will not proliferate.

Counter-Proliferation
- **Extended Deterrence:**
  Creation of military threats to Iran so great that no rational Iranian leader could see an advantage from using weapons of mass destruction.
- **Defense:**
  A mix of measures like missile defense, air defense, counterterrorism, counter smuggling/covert operations capability, civil defense, and passive defense that would both deter Iran and protect against any use it can make of its WMD capabilities.
- **Preventive or Preemptive Strikes Before Iran has a Significant Nuclear Force:**
  Military options that would destroy Iran’s ability to proliferate and/or deploy significant nuclear forces. To build an international consensus to allow the use military force as a last resort when all other options absolutely fail.
Non-Proliferation
NON-PROLIFERATION

• **Diplomacy, Dialogue and the IAEA:**
  Early in his administration, Obama had said he would give the Iranians until the end of 2009 to change their policy on nuclear weapons development. But the end of 2009 came, and the Iranians continued their policy. However, Obama is still trying to make Diplomacy and Dialogue the priority in dealing with the Iranian Nuclear program.
  • Outcomes:
    o Diplomacy and Dialogue Successful
      Diplomacy and dialogue between Iran and the P5+1 (five permanent members of the UNSC plus Germany) make a breakthrough and come to an agreement. In this way the deal reduces the LEU in Iran below the quantity needed which when enriched further could become weapons grade Highly Enriched Uranium (HEU)
    o Diplomacy and Dialogue Not Successful
      In the event that the offers presented are either rejected or the process is inconclusive or unsuccessful, the U.S. will work to impose tough sanction, described by some as “crippling” sanctions on Iran.

• **Sanctions:**
  The U.S. and its allies are trying to rally support, in particular with China and Russia, for new tougher sanctions against Iran over its refusal to stop further enrichment. Most probably the U.N. sanctions resolution would target Iran’s Revolutionary Guards Corps which controls centers and companies that are linked to nuclear weapons proliferation.
  • Outcomes:
    o Sanctions Successful. Iran will cave in due to the international sanctions and will go back to the initial agreement with the P5+1.
    o Total Collapse of the Iranian Economy. The devastating regional consequences with a totally collapsed Iran to the GCC States, Iraq, and even through Afghanistan, Pakistan and India.
    o Sanctions not Successful. Iran will not cave in, and sanctions will not pressure Iran into changing its policy or bring the regime down. Could actually strengthen the Revolutionary Guard Corps. Iran continues with the enrichment process of producing HEU until it reaches to the stage where it is convinced it has the option to “breakout” of the NPT, and move forward in the production of a nuclear weapon whereby it can then be considered a “Nuclear Threshold State”. Could lead to the option of a Military Strike against Iran’s nuclear facilities.
Counter-Proliferation
WHAT COULD ACCELERATE A MILITARY CONFRONTATION WITH IRAN:

• Discovery of further Iranian covert activities in establishing Uranium enrichment facilities for the purpose of building Nuclear Weapons.

• Iran to possess enough weapons grade HEU for a nuclear weapon that can serve as a deterrent against U.S. and Israeli strike.

• Having in its possession highly accurate short, medium and long range ballistic missiles, capable of carrying WMD weapons.

• A modern SAM air defense system, such as Russian S-300PMU2 “Favorit”, giving Iran an advanced BMD capability as well.

• A Maritime capability that can start threatening commercial shipping and Naval Forces in the Gulf, and possibility of interrupting flow of oil through Straits of Hormuz.

• Train and control a number of Insurgency groups and terrorists, increasing threat of asymmetric attacks against US allies in the region.
Counter-Proliferation Options

I. Extended Deterrence
The Emerging Strategic Realities in the Gulf

The US may face a climate of great uncertainty in shaping some aspects of its security posture in the region, but some factors remain clear:

• Iran remains an emerging challenge deeply involved in strategic competition with the US and its friends and allies in the region.

• As General Petraeus and others have explained, the war against terrorism and extremism is going to be a long war that is likely to go on for the next 10-20 years. The Gulf region is going to be one of the centers of this conflict. Al-Qa’ida is not suddenly going away and new organizations are certain to emerge. Nations like Yemen and Somalia present serious long-term risks of becoming centers of terrorist activity.

• Regardless of the outcome of Iraq’s effort to forge a new government, it will not become a major regional military power again for at least a decade. If the US is to have any major strategic partner in the Gulf, it is going to be Saudi Arabia.

• US politicians can posture about reducing US strategic dependence on oil imports, but nothing the President or Congress has done to date will have a major impact before 2035 – the last year in which the US Department of Energy makes meaningful projections. The Department’s Annual Energy Outlook for 2010 estimates that even under very favorable assumptions about the growth of alternative liquids, the US will still be dependent on imports for roughly 40% of its liquid fuels in 2035 – roughly the same percentage as in 1990. These figures do not include additional indirect imports in the form of heavy manufactures. Moreover, the US will have to pay the same world prices for oil as all other importing states if there is a crisis or war in the Gulf. In fact the overall global economy (and indirectly every job in America) will increase its dependence on energy liquids from the Gulf from 28% in 2008 to 31% in 2035 in spite of the same favorable projections about world-wide production of new energy liquids.

• The US faces growing pressures to limit its military spending and commitments, and has steadily increasing needs for regional allies with strong and interoperable forces to deter and contain regional threats and fight alongside US forces if necessary.

• It may or may not be possible to move forward quickly in an Israeli-Palestinian peace agreement, but it is vital to minimize the tensions between our Arab allies and Israel. King Abdullah’s peace plan may differ sharply with Israel’s position, but it shows that the US can sell arms to Saudi Arabia with minimal risk of this impacting on Israel’s security – in fact, strong US security ties to Saudi Arabia offer Israel a far better alternative than Saudi Arabia turning to European or other suppliers and questioning US support if it faces a crisis with Iran.

• If the US is to deter other regional states from proliferation in reaction to Iran, and make its statements about offering “extended regional deterrence” a credible option, it must show it will do its best to create effective regional partners in the Southern Gulf, as well as try to build a strategic partnership with Iraq.

• At the same time, neither the US nor its Gulf allies have any reason to seek open confrontation with Iraq. This is particularly true of the Gulf States. “Speak softly and carry a big stick” may not be an old Arab proverb, but Arab leaders have long practiced this with considerable success.

The US can still count on some support from allies like Britain and France, but the fact remains that it will need its friends and allies in the Gulf even more. The same forces that have made the US and Saudi Arabia key de facto partners in Gulf security will become even more important in the future.

New US Arms Sales to Saudi Arabia

• The US has already made progress in these areas. It has long been a major supplier to the Gulf Cooperation Council states, and has already sold Saudi Arabia the E-2A AWACS surveillance aircraft, Sikorsky’s UH-60 Black Hawks, Raytheon-built Patriot and Hawk missile defense systems, and General Dynamics’ M1A2 tanks. It has worked with the GCC states in joint exercises, and has quietly developed a high level of cooperation in counterterrorism. It has worked with these states in developing counters to Iran’s steadily increasing capabilities for naval asymmetric warfare, and operations against offshore and coastal targets, and is steadily upgrading the air defense forces of many GCC state to provide missile defense capabilities.

• It also has worked with its Gulf allies to develop long-term procurement plans that will improve their capabilities, limit the credibility of any Iranian threats of intimidation, help defend themselves against terrorist or extremist attacks, and fight along side the US against any escalation to large-scale conflict. New US arms sales to Saudi Arabia are part of this effort, although major additional sales are underway or planned for key states like Kuwait and the UAE, and the US works closely with Bahrain, Oman, and Qatar and has bases or contingency bases in these countries.

• The Department of Defense has not yet notified Congress of all of the details of a major new arms sale to Saudi Arabia, but it is clear that this sale could have an direct value well in excess of $50 billion, and mean maintaining a de facto military partnership with Saudi Arabia for at least the next decade. In fact, it means the Saudi Air Force will remain critically dependent on US military and contractor support.

• According to press reports from Bloomberg News and the Wall Street Journal, and work by the WINEP, the sale will include:

• 84 new Boeing F-15 combat aircraft, virtually ensuring Saudi air superiority over Iran for the next decade, as well as a far higher level of interoperability with US air forces. The radar equipment on these aircraft is yet to be announced, but it may give the Saudi Air Force far more capability to deal with the kind of small, dispersed target sets that match Iran’s development of dispersed elements of Iran’s Islamic Revolutionary Guards Corps and the threats posed by its focus on asymmetric warfare.

• Refurbishing and upgrading 70 existing Saudi F-15S strike aircraft that will help achieve the same objectives.

• New air munitions, probably including air to surface missiles with the same precision and ability to fire from outside the range of Iranian air defenses as those used by the US Air Force.

• Up to 60 AH-64D Longbow Apache attack helicopters, and upgrades to 12 existing AH-64As that can be used to deal with threats in areas like the Yemeni border, defend coastal and offshore targets, and counter internal threats from any major terrorist attack.

• 72 UH-60 helicopters, in addition to the 22 UH-60s now in Saudi forces, greatly enhancing Saudi air mobility and capability to react to any major threat in the Gulf or on its borders.

• Upgrades to Saudi Arabia’s Patriot PAC 2 missile forces that will improve both air defense against any Iranian air threat and begin to give Saudi Arabia meaningful missile defense capability against a growing Iranian missile threat.

• A mix of new patrol ships like the Littoral Combat Ship and other naval weapons that will help defend Saudi coastal waters and offshore facilities, and deal with the major emerging threat from the naval branch of Iran’s Islamic Revolutionary Guards.

Massive as these arms transfers may seem, they will occur over at least a five-year period. They are also linked to a list of ongoing US arms sales to Saudi Arabia and other Gulf States that will give them a significant “edge” in air superiority against Iran, help protect their borders and coasts against other states, and assist in countering any serious terrorist attacks.

They are sales that will help secure the flow of energy exports to the global economy and help limit oil prices; they reinforce deterrence rather than threaten it; and they all reduce the size of the force the US must deploy or be ready to project into the region. They will also help ensure the US strategic position in the region at a time when other powers like China are becoming key players in global energy, and when recycling “petrodollars” is even more important than in the past.

II. Active Defense
Components of a multi-layered integrated Ballistic Missile Defense System

(GCC States)

- **Air Launched Concepts**
- **Standard Missile-3**
- **Defense Support Program in Boost Phase**
- **Sensors**

In Mid-Course Phase

**Terminal Phase**
- Speed of warhead and short duration of terminal phase are challenges.
- Warheads can maneuver.

**Mid-Course Phase**
- Longer flight duration
- Exoatmospheric (above atmosphere)
- Must be able to discriminate between weapons and decoys.

**Boost Phase Vehicles**
- Boost Phase short in time duration limiting interception opportunities.
- Missile destruction occurs before dispersal of payload.
- Debris from missile, including warheads, may fall on the launching country.

**Boost Phase**
- Threat most vulnerable.
- Destroy many RVs with single shot.

**C4I and Battle Management**

**Ground Based Interceptor**
- Early Warning Radar
- Ground Based Radar
- Sea Based Radar
- Patriot Advanced Capability PAC-3

**THAAD**
- "Hit to Kill" Technology
- Direct hit of incoming ballistic missile.

**U.S. Aegis Ballistic Missile Defense**
- Ground Based Midcourse Defense
- Multiple Kill Vehicle

**Arbore Lasers**
- Kinetic Energy Interceptors
- Counterforce Operations

**Air Launched Concepts**
Sea Based Air Defenses
The Navy’s Role in Missile Defense Network

Role of the Navy Aegis System:

- Will provide an efficient and highly mobile sea-based defense against Short and Medium – Range Ballistic Missiles in their midcourse phase.
- The system will allow the BMD Command to move its defense capabilities close to the enemy sites.
- The system will have the Engagement & Long Range Tracking Capability
- Intercepting Short to Medium Range Ballistic Missiles in the midcourse phase of the flight with Standard Missile – 3.
- Serves as a forward deployed sensor, providing early warning and long range search & track capabilities for ICBMs and IRBMs.

Contributions:

- Will extend the battle space of the BMDs and contribute to an integrated layered defense.
- The Naval Aegis system extends the range of the Ground Missile defense (GMD) element by providing reliable track data used to calculate firing solutions.
- Aegis BMD will coordinate engagements of short and medium range ballistic missiles with terminal missile defense systems.
- As tracking information is shared among these systems, the BMDS will have the opportunity to follow the engagement of a target during the midcourse segment with coordinated terminal engagements.

Iran – if it acquires the S-300PMU2
BALLISTIC MISSILE DEFENSE SYSTEM, C4ISR & BATTLEFIELD MANAGEMENT.

• The Challenge for the GCC States is to design an effective multi-layered Ballistic Missile Defense System (BMDS) to counter the Short, Medium and Intermediate Ballistic Missiles.

• Due to the very short time window in the defense against Ballistic Missiles, they will have to be engaged automatically, which requires intercept authorization and rules of engagement to be agreed upon in advance. All part of an effective C4ISR / BM system in both peace time and war. This will also act as a Force Multiplier.

• Evident that the key to an effective BMD lies in regional cooperation, which can take a range of forms from coordination and cooperation between command centers and defense systems for BMD purposes - while enabling each state to control its own defenses. Similar to the “Cooperation Belt” that links together all the operations command centers in the GCC states, which produces a Common Operational Picture.

• Cooperation to be comprehensive in nature, leading to a near-real time situation awareness of the military developments in the area, hostile and friendly military capabilities and their operational levels. This would also be in the form of cooperation into BMDs and NBC threat assessment. This requires an C4ISR capability in all its Components, such as, Unmanned Air Systems (UAS’s) / Unmanned Air Vehicles (UAV’s).

• As the Front Lines will be over the Arabian Gulf region, the Navy will have to play a role in Air Defenses and in a Ballistic Missile Defense Network. Sea based systems will provide an efficient and highly mobile defense against Theater Ballistic Missiles.

• The Naval System, such as the U.S. Navy Aegis system, will allow the BMD command to move its defense capabilities close to the enemy sites and serve as a forward deployed sensor and will have the Long Range Engagement and Tracking Capability. This will extend the battle space of the BMDs and contribute to an integrated layered defense.
Counter-Proliferation Options

III. Counterforce Military Strike
Israeli Strike:

- It is possible that Israel will carry out a strike against Iranian Nuclear Facilities, if the U.S. does not, with the objective of either destroying the program or delaying it for some years. The success of the Strike Mission will be measured by how much of the Enrichment program has it destroyed, or the number of years it has delayed Iranian acquisition of enough Uranium or Plutonium from the Arak reactor to build a nuclear bomb.

- We conclude that a military strike by Israel against Iranian Nuclear Facilities is possible and the optimum route would be along the Syrian-Turkish border then over a small portion of Iraq then into Iran, and back the same route. However, the number of aircraft required, refueling along the way and getting to the targets without being detected or intercepted would be complex and high risk and would lack any assurances that the overall mission will have a high success rate.

- The U.S. would certainly be perceived as being a part of the conspiracy and having assisted and given Israel the green light, whether it did or had no part in it whatsoever. This would undermine the U.S. objectives in increasing stability in the region and bringing about a peaceful solution to the Arab-Israeli conflict. It will also harm for a very long period of time relations between the U.S. and its close regional allies.

- Another scenario is in using Low Yield Earth Penetrating Nuclear Weapons as a substitute for conventional weapons to attack deeply buried nuclear facilities in Iran. Some believe that these are the only weapons that can destroy targets deep underground or in tunnels.

- The Israeli Sea Launched Cruise Missile (SLCM), Popeye Turbo, with a range of 1,500km launched from the German built Dolphin-class submarine, is capable of carrying these nuclear warheads. Israel is reported to possess a 200kg nuclear warhead containing 6 kg of weapons grade Plutonium that could be mounted on the Sea Launched Cruise Missiles and producing a Yield of 20KT.

- The U.S. President would not authorize the use of such nuclear weapons, or even allow any other country, even a strong ally such as Israel, to use them, unless another country had used nuclear weapons against the U.S. and its allies.

- It is doubtful that an Israeli strike on Iranian Nuclear Facilities would bring Syria into a direct conflict with Israel. Syria knows very well that alone its military forces are no match to Israel. However, proxy actors such as

- A strike by Israel on Iran will give rise to regional instability and conflict as well as terrorism. The regional security consequences will be catastrophic.
Israeli Strike against Iranian Nuclear Facilities
Main Target Set

**ARAK:** Heavy Water Plant and Future Plutonium Production Reactor (5,500 sq m)

**Natanz:** Uranium Enrichment Facility (65,000 sq m)

**Esfahan:** Nuclear Research Center. Uranium Conversion Facility (UCF). (10,000 sq m)

**Qum:** Enrichment Facility with Tunnel Entrances

**Bushehr:** 1000 MW Nuclear Power Plant

Aerial Refueling during Ingress and Egress.
Israelí Dolphin-Class Submarines & SLCM Ranges to Iranian Nuclear Facilities

Israelí Dolphin-Class Submarine

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement, metric tons</td>
<td>1,640 surfaced, 1,900 submerged</td>
</tr>
<tr>
<td>Dimensions (m)</td>
<td>57.3 x 6.8 x 6.2</td>
</tr>
<tr>
<td>Main Machinery</td>
<td>Diesel - Electric</td>
</tr>
<tr>
<td>Speed, Knots</td>
<td>11 Snorting, 20 Submerged</td>
</tr>
<tr>
<td>Range</td>
<td>4,500 km</td>
</tr>
<tr>
<td>Complement</td>
<td>30 (including 6 officers)</td>
</tr>
<tr>
<td>Diving Depth (m)</td>
<td>350 m</td>
</tr>
<tr>
<td>Endurance</td>
<td>30 days</td>
</tr>
<tr>
<td>Weapons</td>
<td>5 SSM/SLCMs and 16 torpedoes; four 25.6” (650 mm) and six 21” (533mm) tubes; Mines in lieu of torpedoes.</td>
</tr>
<tr>
<td>Comments</td>
<td>The modernized Dolphin-class submarines with an air-independent propulsion system (AIP) which makes vessel quiet and remain submerged for up to a week without surfacing.</td>
</tr>
</tbody>
</table>
GCC Strike:

• GCC aircraft allocated for the strike mission would be: F-15S, F-16C and Mirage 2000, equipped with GBU-27A and GBU-28A bombs.

• Mission, can be operationally achieved with a much higher success rate than an Israeli strike, given the same aircraft and weapons. Shorter distances to cover giving the capability to keep up a sustained GCC attack over a couple of days.

However

• GCC countries will not launch a strike on Iran, nor will they allow their territories to be used as a launching stage in any pre-emptive strikes against Iran. The GCC States military posture has always been a Defensive Posture.

• GCC has been calling for a peaceful resolution of the Nuclear weapons issue between the West and Iran in the form of Dialog and Negotiations. GCC states might approve of sanctions however, not to the “crippling” level that is being presently advocated and definitely not in a way that could lead to the collapse of the Iranian Economy.

• Even with a U.N. resolution to attack and destroy the Iranian facilities, the GCC countries will most probably not participate, but could give low profile support.
### GCC Strike against Iranian Nuclear Facilities

**Main Target Set**

- Iran
- Iraq
- Jordan
- Saudi Arabia
- Yemen
- Oman
- Egypt
- Sudan

### Aircraft

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Total in Inventory</th>
<th>Operational Ready (75%)</th>
<th>Allocated for Mission</th>
<th>Sortie per AC per day</th>
<th>Total Sorties (315)</th>
<th>Aircraft left for other missions</th>
<th>Projected Sorties (359)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-15S</td>
<td>71</td>
<td>53</td>
<td>30</td>
<td>2</td>
<td>60</td>
<td>23</td>
<td>46</td>
</tr>
<tr>
<td>F-16C</td>
<td>104</td>
<td>78</td>
<td>17</td>
<td>3</td>
<td>51</td>
<td>61</td>
<td>183</td>
</tr>
<tr>
<td>M2000</td>
<td>74</td>
<td>56</td>
<td>38</td>
<td>3</td>
<td>114</td>
<td>18</td>
<td>54</td>
</tr>
<tr>
<td>Tornado IDS</td>
<td>25</td>
<td>19</td>
<td>15</td>
<td>2</td>
<td>30</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Tornado ADV</td>
<td>85</td>
<td>64</td>
<td>30</td>
<td>2</td>
<td>60</td>
<td>34</td>
<td>68</td>
</tr>
</tbody>
</table>
US Strike:

- B-2 bombers out of Diego Garcia, each carrying 2 GBU-57 MOP bombs.
- Mission can be achieved with a high success rate also maintaining a sustained strike over a couple of days.
- B-2 bombers escorted by F-18s from the 5th fleet stationed in the Gulf waters, or F-15Es and F-16Cs from forward area bases.
- United States and Western allies considered to be the only countries involved, no GCC or any Arab country involvement and especially no-Israeli direct involvement.
- Still though, Iran most probably will accuse Israel to be part of the Strike and will try to retaliate, either by launching a Ballistic Missile on Israel carrying conventional or WMD (chemical, biological, radiological) and activating Hezbollah to launch cross border attacks against Israel.
- Iran would also try to attack any U.S. military airbases that are active in the Gulf even if they are stationed in GCC countries.
- If Iran attacks any of the GCC countries, then they will have the right to self-defense. In addition the whole Arab Middle East will not accept an Iranian attack on any of the GCC countries.
Air Superiority Aircraft Escorting the B2 Bombers could be F-18’s off the US 5th Fleet, or could be F-15E/F-16C launched from Forward Area Bases.

These aircraft can also perform all Offensive Counterair Operations:

- Fighter Sweep
- SEAD (Suppression of Enemy Air Defense)
- Interdiction
- Escort

- B2 Bombers stationed in Diego Garcia
- Payload: 2 B-57 A/B Massive Ordnance Penetrator (MOP)
- Range from Diego Garcia to Target area in Iran about 5,000 km
If Diplomacy and Deterrence Fail:
Possible Iranian Military Response to a Strike Option
Possible Iranian military response:

- Iran’s Nuclear Program
  - Increase Iran’s long term resolve to develop a nuclear deterrent program. Could be the beginning rather than the end of such a program. Iran could start an accelerated program in building its own nuclear weapons. It could also covert its dispersed facilities into a full weapons development program and be brought online in a very short period of time.

- Iran and the IAEA
  - Iran would withdraw from the NPT based on the argument that it needs to acquire nuclear weapons to deter any further aggression by Israel and the U.S.

- Iranian response against Israel
  - Immediate retaliation using its ballistic missiles on Israel. Multiple launches of Shahab-3 including the possibility of CBR warheads against Tel Aviv, Israeli military and civilian centers, and Israeli suspected nuclear weapons sites.
  
  - Using proxy groups such as Hezbollah or Hamas to attack Israel proper with suicide bombings, covert CBR attacks, and rocket attacks from southern Lebanon.

- Regional Security
  - Give rise to regional instability and conflict as well as terrorism.
  - Destabilizing Iraq through the Shia against US occupation, further arming insurgency groups when possible.
  - Support and upgrade Taliban capabilities in Afghanistan.
  - Increase the threat of asymmetric attacks against American interests and allies in the region, especially against countries that host the US military such as Qatar and Bahrain.
  - Target U.S. and Western shipping in the Gulf, and possibly attempt to interrupt the flow of oil through the Straits of Hormuz.
Iranian Ballistic Missile Retaliatory Attack against Israeli Nuclear & Missile Facilities
- Yodefat: Possible assembly and dismantling
- Haifa: Rafael-Israel Armament Development Authority. Reported Nuclear Design and Assembly.
- Soreq: Nahal Soreq Nuclear Research Center (MAMAG) 5 MW safeguarded pool type reactor; possible weapon design and Research Facility.
- Tirosh: Possible Storage Facility
- Eilabun: Possible Storage Facility
- Dimona Negar Nuclear Research Center (KAMAG): Houses a Reactor, Enrichment and Reprocessing Facilities.

(Source: Anthony Cordesman. Israeli Weapons of Mass Destruction” CSIS June 2, 2008)
Israel: Missile Facilities

Haifa:
Rafael-Israel Armament Development Authority. Reported Nuclear Missile Design and Development.

Tel Aviv:
Israel Space Agency and Israel Aircraft Industries.

Palmachim Airbase:
Missile Test Range and Space Launch Facility.

Be’er Yaakov:
Missile Assembly Facility; Arrow, Jericho and Shavit Missiles.

Kfar Zeharya:
A.K.A. Hirbut Zachariah/Sdot Micha. Jericho I missiles, possible Jericho II.

(Source: Anthony Cordesman. Israeli Weapons of Mass Destruction” CSIS June 2, 2008)
Oil Facilities & Oil transit Chokepoints as Iranian Targets
Total attacks against oil and gas targets worldwide declined by 27 percent in 2009 and have steadily declined since 2006.

One of the most significant declines was in Iraq where attacks were down almost 50 percent—from 31 in 2008 to 16 in 2009—possibly due to the country's improved security situation.

Excluding Iraq, attacks on the oil and gas sector in the Middle East were low, with four in 2009 versus eight in 2008.

Attacks were also down 28 percent in Nigeria, where a ceasefire in the oil producing Niger Delta region temporarily halted militant attacks and thousands of militants accepted a government amnesty offer and disarmed in October 2009.

Afghanistan saw a slight increase in attacks with 14 in 2009 compared to 10 in 2008, which is still relatively low for a war zone.

While Pakistan saw attacks decline to 59 in 2009 versus 80 in 2008—the number of attacks remained high in comparison to war zones due to the deteriorating security situation across the country that has prompted the Pakistani military to pursue operations against militants that operate there.

(Source: SAGRA adapted from NCTC Worldwide Incidents Tracking System – WITS)
Oil Transit Chokepoints

• The Suez Canal/Sumed Pipeline:  
  • Oil Flow: 4.5 million bbl/d

• The Strait of Hormuz:  
  • Oil Flow: 16.5 million bbl/d

• Bab el-Mandab:  
  • Oil Flow: 3.3 million bbl/d
<table>
<thead>
<tr>
<th>Name</th>
<th>2006E oil flow (bbl/d)</th>
<th>Width at Narrowest Point</th>
<th>Oil Source Origin</th>
<th>Primary Destination</th>
<th>Past Disturbances</th>
<th>Alternative Routes</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Strait of Hormuz</td>
<td>16.5 – 17 million (70% of Gulf Supply 24.3 mn b/d)</td>
<td>21 miles</td>
<td>Gulf Nations including Saudi Arabia, Iran and UAE</td>
<td>Japan, The United States, Western Europe, other Asian countries</td>
<td>Sea mines were installed during the Iran-iraq War in the 1980s. Terrorist threats post September 11, 2001</td>
<td>745 miles long East-West Pipeline through Saudi Arabia to the Red Sea</td>
</tr>
<tr>
<td>The Strait of Malacca</td>
<td>15 million</td>
<td>1.7 miles</td>
<td>Gulf Nations, West Africa</td>
<td>All Asia/Pacific consumers including Japan and China</td>
<td>Disruptions from pirates are a constant threat, including a terrorist attack in 2003. Collisions and oil spills are also a problem. Poor visibility from smoke haze.</td>
<td>Reroute through the Lombok or Sunda Strait in Indonesia. Possible pipeline construction between Malaysia and Thailand.</td>
</tr>
<tr>
<td>The Suez Canal/Sumed Pipeline</td>
<td>4.5 million</td>
<td>1,000 feet</td>
<td>Gulf Nations especially Saudi Arabia, and Asia.</td>
<td>Europe and The United States.</td>
<td>Suez Canal was closed for eight years after the Six Day War in 1967. Two large oil tankers ran aground in 2007 suspending traffic.</td>
<td>Reroute around the southern tip of Africa (the Cape of Good Hope) additional 6,000 miles.</td>
</tr>
<tr>
<td>Bab el-Mandab</td>
<td>3.3 million</td>
<td>18 miles</td>
<td>The Gulf Nations</td>
<td>Europe and The United States</td>
<td>USS Cole attack in 2000; French oil tanker in 2002, both attacks off the coast of Aden, Yemen.</td>
<td>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.</td>
</tr>
<tr>
<td>The Turkish Straits</td>
<td>2.4 million</td>
<td>0.5 mile</td>
<td>Caspian Sea Region</td>
<td>Western and Southern Europe</td>
<td>Numerous past shipping accidents due to the straits sinuous geography. Some terrorist threats were made after September 11, 2001</td>
<td>No clear alternative; potential pipelines discussed including a 173 mile pipeline between Russia, Bulgaria, and Greece.</td>
</tr>
<tr>
<td>The Panama Canal</td>
<td>0.5 million</td>
<td>110 feet</td>
<td>The United States</td>
<td>The United States, and other Central American countries</td>
<td>Suspected terrorist target.</td>
<td>Reroute around Straits of Magellan, Cape Horn and Drake Passage; additional 8,000 miles.</td>
</tr>
</tbody>
</table>

(Source: http://www.eia.doe.gov/emeu/cabs/World_Oil_Transit_Chokepoints/Background.html)
Strait of Hormuz

• Strait of Hormuz is the world's most important oil chokepoint due to its daily oil flow of 16.5-17 million barrels (first half 2008E), which is roughly 40 percent of all seaborne traded oil (or 20 percent of oil traded worldwide). Oil flows averaged over 16.5 million barrels per day in 2006, dropped in 2007 to a little over 16 million barrels per day after OPEC cut production, but rose again in 2008 with rising Gulf supplies.

• At its narrowest point the Strait is 21 miles wide, and the shipping lanes consist of two-mile wide channels for inbound and outbound tanker traffic, as well as a two-mile wide buffer zone. The majority of oil exported through the Strait of Hormuz travels to Asia, the United States and Western Europe. Currently, three-quarters of all Japan’s oil needs pass through this Strait. On average, 15 crude oil tankers passed through the Strait of Hormuz daily in 2007, along with tankers carrying other petroleum products and liquefied natural gas (LNG).

• Closure of the Strait of Hormuz would require the use of longer alternate routes at increased transportation costs. Alternate routes include the 745 miles-long Petroline, also known as the East-West Pipeline, across Saudi Arabia from Abqaiq to the Red Sea. The East-West Pipeline has a capacity to move five million-bbl/d. The Abqaiq-Yanbu natural gas liquids pipeline, which runs parallel to Petroline to the Red Sea, has a 290,000-bbl/d capacity. Other alternate routes could include the deactivated 1.65-million bbl/d Iraqi Pipeline across Saudi Arabia (IPSA), and the 0.5 million-bbl/d Tapline to Lebanon. Oil could also be pumped north to Ceyhan in Turkey from Iraq.

(Source: http://www.eia.doe.gov/emeu/cabs/World_Oil_Transit_Chokepoints/Hormuz.html)
Bab el-Mandab

- The Strait of Bab el-Mandab is a chokepoint between the horn of Africa and the Middle East, and a strategic link between the Mediterranean Sea and Indian Ocean. It is located between Yemen, Djibouti, and Eritrea, and connects the Red Sea with the Gulf of Aden and the Arabian Sea. Exports from the Gulf must pass through Bab el-Mandab before entering the Suez Canal. In 2006, an estimated 3.3 million bbl/d flowed through this waterway toward Europe, the United States, and Asia. The majority of traffic, around 2.1 million bbl/d, flows northbound through the Bab el-Mandab to the Suez/Sumed complex.

- Bab el-Mandab is 18 miles wide at its narrowest point, making tanker traffic difficult and limited to two 2-mile-wide channels for inbound and outbound shipments. Closure of the Strait could keep tankers from the Gulf from reaching the Suez Canal or Sumed Pipeline, diverting them around the southern tip of Africa. This would effectively engage spare tanker capacity, and add to transit time and cost.

- The Strait of Bab el-Mandab could be bypassed through the East-West oil pipeline, which crosses Saudi Arabia with a 4.8 million bbl/d capacity. However, southbound oil traffic would still be blocked. In addition, closure of the Bab el-Mandab would block non-oil shipping from using the Suez Canal, except for limited trade within the Red Sea region.

- Security remains a concern of foreign firms doing business in the region, after a French tanker was attacked off the coast of Yemen by terrorists in October 2002.

(Source: http://www.eia.doe.gov/emeu/cabs/World_Oil_Transit_Chokepoints/Bab_el-Mandab.html)
Suez/Sumed

• The Suez Canal is located in Egypt, and connects the Red Sea and Gulf of Suez with the Mediterranean Sea. The Canal is one of the world’s greatest engineering feats covering 120 miles. Oil shipments from the Gulf travel through the Canal primarily to European ports, but also to the United States. In 2006, an estimated 3.9 million bbl/d of oil flowed northbound through the Suez Canal to the Mediterranean, while 0.6 million bbl/d travelled southbound into the Red Sea.

• Over 3,000 oil tankers pass through the Suez Canal annually, and represent around 25 percent of the Canal’s total revenues. With only 1,000 feet at its narrowest point, the Canal is unable to handle large tankers. The Suez Canal Authority (SCA) has discussed widening and deepening the Canal to accommodate VLCCs and Ultra Large Crude Carriers (ULCC).

• The 200-mile long Sumed Pipeline, or Suez-Mediterranean Pipeline, also provides a route between the Red and Mediterranean Seas by crossing the northern region of Egypt from the Ain Sukhna to the Sidi Kerir Terminal. The pipeline provides an alternative to the Suez Canal, and can transport 3.1 million bbl/d of crude oil. In 2006, nearly all of Saudi Arabia’s northbound shipments (approximately 2.3 million bbl/d of crude) were transported through the Sumed pipeline. The pipeline is owned by Arab Petroleum Pipeline Co., a joint venture between EGPC, Saudi Aramco, Abu Dhabi’s ADNOC, and Kuwaiti companies.

• Closure of the Suez Canal and the Sumed Pipeline would divert tankers around the southern tip of Africa, the Cape of Good Hope, adding 6,000 miles to transit time.

(Source: http://www.eia.doe.gov/emeu/cabs/World_Oil_Transit_Chokepoints/Suez.html)
The Other Side of the Threat:

Terrorism & CBRN Weapons
• One important aim of the U.S. invasion of Afghanistan was to destroy and eliminate the main bases of al-Qaida and its central command structure. The 9/11 attacks demonstrated that transnational terrorism is becoming more lethal, and that it can produce a fundamental political and strategic impact. The threat of terrorist use of CBRN (Chemical, Biological, Radiological and Nuclear) weapons is still possible and perhaps inevitable given the goals of al-Qaida.

• The threat of terrorist use of CBRN weapons, is a real one that represents a very serious threat to the U.S. and other nations that are potential targets of sub-national terrorist groups or networks. Transnational terrorism and the potential acquisition by terrorists of weapons of mass destruction are part of the ‘asymmetric’ dynamics of the new threats that have emerged and have thrust the international community into a new era of warfare.

• As far as is presently known, terrorist groups do not have in their possession nuclear weapons. However they could have the capability sometime soon given that knowledge about these kinds of weapons are available worldwide. Recent terrorist attacks have shown a rise in the tendency towards the use of mass-causality weapons for which WMD could be very well suited.

• The attempted terrorist attacks to simultaneously bomb locations in Jordan, in April 2004, using conventional explosives to disperse toxic chemical material, clearly demonstrates the deliberate planning for use of toxic chemical material in terrorism. Jordanian security forces foiled the attack on Jordanian and U.S. targets with a preemptive raid on the facilities used by the terrorists. Reports estimate that approximately 20 tons of chemicals were confiscated, which could have caused tens of thousands of casualties. The intent for the indiscriminate nature of the terrorist attacks was clear and projected how fast and how large a future attack using mass destruction bombs would occur.

• For radiological attacks a study was conducted by the Federation of American Scientists in which the destructive effects of various types of radiological bombs were analyzed. The case studies consisted of Cobalt, Cesium and Americium bombs. The conclusion was that “While radiological attacks would result in some deaths, they would not result in the hundreds of thousands of fatalities that could be caused by a crude nuclear weapon. Attacks could contaminate large urban areas with radiation levels that exceed the Environment Protection Agency (EPA) health and toxic material guidelines”.
Terrorist Attacks by Region

(Source: SAGRA adapted from NCTC Worldwide Incidents Tracking System – WITS)
Terrorist Attacks by Region

(Source: SAGRA adapted from NCTC Worldwide Incidents Tracking System – WITS)

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Change in total attacks</td>
<td>Increase by 29%</td>
<td>Increase by 1%</td>
<td>Decline by 19</td>
<td>Decline by 6.5%</td>
<td>Decline by 21%</td>
<td></td>
</tr>
<tr>
<td>M.E. plus Iran % change in attacks</td>
<td>Increase by 84%</td>
<td>Decline by 3%</td>
<td>Decline by 39%</td>
<td>Decline by 28%</td>
<td>Decline by 23%</td>
<td></td>
</tr>
<tr>
<td>South Asia % change in attacks</td>
<td>Decline by 9%</td>
<td>Decline by 1.5%</td>
<td>Increase by 21%</td>
<td>Increase by 11%</td>
<td>Decline by 13.5%</td>
<td></td>
</tr>
</tbody>
</table>

- **M.E. plus Iran % of total attacks**: 38% 54% 52% 39% 30% 30%
- **South Asia % of total attacks**: 36% 25.5% 25% 37% 44% 48%
- **Iraq % of M.E. plus Iran attacks**: 79% 85% 82% 71% 75% 79%
- **Iraq % of total attacks**: 30% 46% 43% 28% 22% 23%
- **M.E., Iran plus South Asia % of total attacks**: 74% 80% 77% 76% 74% 77.5%

(Source: SAGRA adapted from NCTC WITS —Worldwide Incidents Tracking System)
Terrorism Shifting from Middle East to the South Asia Region

Terrorism Trend Comparison

Middle East plus Iran: Egypt, Jordan, Syria, Lebanon, Palestine, GCC, Iraq, Yemen, Israel, Iran
South Asia: Afghanistan, Pakistan, India, Bangladesh, Bhutan, Maldives, Nepal, Sri Lanka

(Source: SAGRA adapted from NCTC Worldwide Incidents Tracking System – WITS)
Use of Chemical, Biological, Radiological and Nuclear Weapons in Terrorist Attacks

Terrorism Attacks By Weapon Type
(2004 - 2010)

(Source: SAGRA adapted from NCTC Worldwide Incidents Tracking System – WITS)
A Chronology of Terrorism using CBRN weapons:

**Sep 15, 2004**
9 hospitalized in CBRN attack on a government facility in Pretoria, Gauteng, South Africa

**February 22, 2005**
NATO, US Embassy, Royal Palace, European Parliament targeted in CBRN attack in Brussels, Bruxelles-Capitale, Belgium

**Oct 21 2006**
3 police officers, 1 civilian wounded in VBIED and CBRN attack in Ar Ramadi, Al Anbar, Iraq

(Source: SAGRA adapted from NCTC Worldwide Incidents Tracking System – WITS)
Jan 11, 2007
33 civilians, 2 police officers, several children killed, 90 civilians, 5 children, 2 police officers wounded in suicide VBIED and CBRN attack in Ar Ramadi, Al Anbar, Iraq

Feb 19, 2007
2 police officers killed, 3 others, 13 civilians wounded in suicide VBIED and CBRN attack in Ar Ramadi, Al Anbar, Iraq

Feb 20, 2007
7 civilians, 2 children killed, 98 civilians, 50 children wounded in VBIED and CBRN attacks in At Taji, Salah ad Din, Iraq

Feb 21, 2007
6 civilians killed, 70 others wounded in VBIED and CBRN attack in Baghdad, Iraq

Mar 16, 2007
2 police officers, 6 civilians killed, 323 civilians, 28 children, 6 soldiers wounded in triple suicide VBIED and CBRN attacks by suspected ISI/MSC in Al Anbar, Iraq

March 25, 2007
Several civilians injured in CBRN attack in Al Miqdadiyah, Diyala, Iraq

Mar 28, 2007
8 police officers, several soldiers killed, 14 police officers, several soldiers wounded in armed, suicide VBIED, and CBRN attacks by ISI/MSC in Al Fallujah, Al Anbar, Iraq
Apr 6, 2007
33 civilians, 2 police officers, several children killed, 90 civilians, 5 children, 2 police officers wounded in suicide VBIED and CBRN attack in Ar Ramadi, Al Anbar, Iraq

May 15, 2007
45 civilians killed, 60 others wounded in suicide VBIED, CBRN, and mortar attack by ISI/MSC in Abu Saydah, Diyala, Iraq

May 20, 2007
2 police officers killed, 9 civilians wounded in suicide VBIED and CBRN attack in Zanqrubah, Al Anbar, Iraq

May 25, 2007
8 police officers, several soldiers killed, 14 police officers, several soldiers wounded in armed, suicide VBIED, and CBRN attacks by ISI/MSC in Al Fallujah, Al Anbar, Iraq

Jun 13, 2007
1 civilian killed, 8 others wounded in VBIED and CBRN attack in Khan Bani Sa'd, Diyala, Iraq

May 23, 2008
1 civilian killed, 8 others wounded in VBIED and CBRN attack in Khan Bani Sa’d, Diyala, Iraq

(Source: SAGRA adapted from NCTC Worldwide Incidents Tracking System – WITS)
An Anthrax bio attack is considered to be most probable terrorism attack.

Would result in some deaths but not in the hundreds of thousands of fatalities that could be caused by a crude nuclear weapon.

Lowest probability to occur but if it occurs the Political and Economic consequences will be catastrophic.

(Source: Strategic Analysis and Global Risk Assessment – SAGRA Center)

(Source: SAGRA adapted from NCTC Worldwide Incidents Tracking System – WITS)
Worldwide Terrorism Casualties (2008 – 2010)

(Source: SAGRA adapted from NCTC Worldwide Incidents Tracking System – WITS)
Terrorist Attacks by Country 2010

Attacks by Country (2010)

- Afghanistan: 2514
- Iraq: 2016
- Pakistan: 1032
- India: 616
- Somalia: 411
- Thailand: 330
- Russia: 297
- Philippines: 199
- Gaza Strip: 185
- Colombia: 184
- Yemen: 136
- Israel: 124
- Greece: 109
- Congo D.R.: 78
- West Bank: 51
- Sudan: 43
- Algeria: 37

Deaths by Country (2010)

- Iraq: 2704
- Afghanistan: 2475
- Pakistan: 1680
- Somalia: 946
- India: 624
- Congo D.R.: 287
- Russia: 264
- Thailand: 199
- Colombia: 148
- Philippines: 136
- Yemen: 124
- Uganda: 76
- Iran: 73
- Sudan: 70
- Central African Rep: 68
- Algeria: 56
- Turkey: 22

(Source: SAGRA adapted from NCTC Worldwide Incidents Tracking System – WITS)
The highest seventeen countries have been considered
Terrorist Attacks by Country 2010

Hostages by Country (2010)

- Gaza Strip: 320
- Somalia: 704
- Afghanistan: 696
- Congo Dem Rep: 674
- Pakistan: 314
- Central African Rep: 291
- India: 241
- Philippines: 182
- Sudan: 141
- Colombia: 131
- Nigeria: 48
- Yemen: 31
- Iraq: 18
- Niger: 10
- Iran: 0
- Honduras: 8
- Mexico: 8

Wounded by Country (2010)

- Iraq: 9365
- Afghanistan: 3808
- Pakistan: 3561
- Somalia: 2281
- Russia: 853
- Thailand: 612
- India: 511
- Iran: 429
- Congo Democratic Rep: 388
- Colombia: 303
- Philippines: 217
- Burma: 217
- Yemen: 171
- Algeria: 124
- Uganda: 114
- Sudan: 83
- Kenya: 79

(Source: SAGRA adapted from NCTC Worldwide Incidents Tracking System – WITS)
The highest seventeen countries have been considered
## Risk Factors Considered in the Regional Risk Landscape

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<th>Geopolitical Risks</th>
<th>Economic Risks</th>
<th>Business Risks</th>
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<td>• Transparency of government policy</td>
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<td>• Freedom of press</td>
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<td>• Dealing with Licenses</td>
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<td>• Interstate wars</td>
<td>• Labor Force</td>
<td>• Registering Property</td>
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<tr>
<td>• Effectiveness of law-making bodies</td>
<td>• Migration per 1000</td>
<td>• Getting Credit</td>
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<tr>
<td>• Judicial Independence</td>
<td>• Public Debt</td>
<td>• Protecting Investors</td>
</tr>
<tr>
<td>• Efficiency of legal framework in settling disputes</td>
<td>• Unemployment</td>
<td>• Paying Taxes</td>
</tr>
<tr>
<td>• Efficiency of legal frameworks in challenging regulations</td>
<td>• Yearly Inflation</td>
<td>• Trading Across Borders</td>
</tr>
<tr>
<td>• Business costs of terrorism</td>
<td>• Oil Prices Spikes</td>
<td>• Enforcing Contracts</td>
</tr>
<tr>
<td>• Business costs of crime &amp; violence</td>
<td>• Food Price Volatility</td>
<td>• Closing a Business</td>
</tr>
<tr>
<td>• Transnational Crime and Corruption</td>
<td>• Major Fall in US Dollar</td>
<td>• Business Infrastructure</td>
</tr>
<tr>
<td></td>
<td>• Slowing of the Chinese Economy, less than 6%</td>
<td>• Macroeconomic Stability</td>
</tr>
<tr>
<td></td>
<td>• Fiscal Crisis</td>
<td>• Goods Market Efficiency</td>
</tr>
<tr>
<td></td>
<td>• Retrenchment from Globalization</td>
<td>• Labor Market Efficiency</td>
</tr>
<tr>
<td></td>
<td>• Asset Price Collapse</td>
<td>• Financial Market Sophistication</td>
</tr>
</tbody>
</table>