

## CHAPTER 9

### REDUCING VULNERABILITY OF THE STRAIT OF HORMUZ

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The Strait of Hormuz is a vitally important international waterway that connects the Persian Gulf with the Gulf of Oman. The passageway is by far the single most important chokepoint in the world oil transportation system. It consists of two, mile-wide channels for inbound and outbound tanker traffic in addition to a 2-mile-wide buffer zone. It is 50 kilometers wide at its narrowest point.<sup>1</sup>

The Strait is the main passageway for 15 to 16 million barrels of oil a day, roughly two-thirds of total world oil trade by tanker and 20 percent of total world daily oil demand. Oil and petroleum products from Iraq, Iran, Kuwait, Saudi Arabia, Qatar, and the United Arab Emirates (UAE) transit the Strait of Hormuz. Large quantities of liquefied natural gas are also exported from Qatar through the Strait. The significance of the Strait of Hormuz has become enhanced in recent years because virtually all of the world's excess spare production capacity that can be brought on line quickly to defend against the adverse effects of a sudden oil supply crisis or disruption is located in Saudi Arabia, Kuwait, and the UAE and thereby could be cut off, if the Strait could be closed.

Maintaining the free flow of oil through the Strait of Hormuz is of vital strategic importance to the world economy and to the United States and its allies. The United States receives about 25 percent of its imported oil via the Straits. Asia buyers are other key purchasers of Persian Gulf oil with China, Japan, South Korea, India, and Singapore receiving the lion's share of Middle East exports through the Strait of Hormuz. Keeping the Strait open is important as a matter of protecting the international order and global economy by maintaining the indisputable right of the freedom of navigation of international seaways that is so vital to international trade and commerce. About 30 U.S. warships now patrol the Persian Gulf and nearby waters, about twice the level posted there during the Iran-Iraq war in the 1980s.<sup>2</sup>

There have been several challenges to the freedom of navigation in the Strait of Hormuz and adjacent territories over the last several decades. The most prolonged threat to navigation in the Persian Gulf in recent years arose during the 8-year war between Iraq and Iran. By 1984, the then 3-year-old Iraq-Iran war entered its so-called “tanker phase,” with regular bombings of shipping and oil export facilities, and mining of the waters of the Persian Gulf.<sup>3</sup> By 1987, the United States responded to the escalation of attacks on Persian Gulf shipping by organizing a fleet of frigates, destroyers, and minesweepers in the region to combat the threat against shipping.<sup>4</sup> In March 1987, the U.S. Government agreed to transfer Kuwaiti oil and gas tankers to the American flag, and in July 1987, the U.S. Navy initiated Operation EARNEST WILL, providing naval escorts to tankers passing through the Persian Gulf.<sup>5</sup>

In April 2004, U.S. Navy vessels were called to service to repel attacks by terrorist suicide bombers on both of Iraq’s offshore oil shipping terminals, and shippers from the Persian Gulf region are again asking the U.S. military to provide naval escorts.<sup>6</sup> The possibility of terrorist attacks at the Strait of Hormuz cannot be ruled out as similar threats already have been identified in Asia against another vital oil waterway, the Straits of Malacca.<sup>7</sup>

The nature of future risks against free navigation in the Strait of Hormuz appear at present to come mainly from two directions: (1) the possibility that a nongovernmental group, such as al-Qaeda, will plot to disrupt traffic in the Strait through suicide bombings attacks using divers or small ships, or by deploying a dirty bomb or other kinds of weapons of mass destruction (WMD); or (2) the possibility that a neighboring state would threaten passage of the Strait through conventional or nonconventional military means to gain leverage in a localized dispute or during a political or strategic conflict with a major power such as the United States or a major Asian oil consuming nation.

The U.S. naval presence in the Persian Gulf and overwhelming U.S. naval superiority for the foreseeable future is likely to discourage a major conventional attack on shipping in the Persian Gulf by any nation with naval capabilities. There currently does not appear to be an emerging naval power with the means or inclination to challenge the U.S. mission of protecting the Strait of Hormuz. However, the

possibility of a smaller, regional nation-state threatening free passage through the Strait using non-naval military capabilities cannot be ruled out. Iran, for example, has a history of challenging the status quo in the region and might, under extreme circumstances, pose a risk to the safety of passage through the waterway.

A territorial dispute between Iran and the UAE over three islands inside the shipping lanes of the Strait of Hormuz has continued for several decades. The islands, Abu Musa and the Greater and Lesser Tunbs, were determined to be run under co-sovereignty by the two nations in 1971, following the departure of British colonial rule from the region. However, since 1992, Iran has occupied the islands and taken steps towards unilateral control over the course of the 1990s, restricting outside access, building an airstrip, and deploying SA-6 surface-to-air missiles, 155 millimeter artillery, and seersucker anti-aircraft missiles on Abu Musa.<sup>8</sup> Iran test fired an anti-ship missile near the Strait of Hormuz in 1987<sup>9</sup> and again in January 1996.<sup>10</sup> Iran has silkworm missiles deployed at Qeshm, Abu Musa Island, and on Sirri Island, all within range of shipping through the Strait.<sup>11</sup>

In June 2004, a UAE warship fired on an Iranian fishing vessel in waters close to Abu Musa Island.<sup>12</sup> The Arab Gulf Cooperation Council has backed UAE claims to the islands, but Iran has refused to agree to international arbitration on their status. In April 2004, Iran also accused Qatar of overproducing its share of natural gas from the giant offshore North Field that straddles the Qatari-Iranian border, warning that Iran would resort to “other ways and means of resolving the issue” if Qatar did not enter new negotiations about regulating production from the field. The North Field/South Pars gas reserves were clearly demarcated in a maritime border deal in the late 1980s.<sup>13</sup>

### **Assessing The Threat of a Nuclear Iran to the Strait.**

The backdrop of conventional Iranian military actions inside the Persian Gulf has raised concerns about whether a nuclear Iran would use the leverage of nuclear capability to demand political or other gains by threatening traffic through the Strait of Hormuz via conventional or nonconventional means. A potential conflict between the United States and Iran on a number of issues, including

international terrorism or the proliferation of WMD, would raise the stakes of such a risk. The possibility of such a threat, however, must be evaluated against the backdrop of improved U.S.-Iranian cooperation in several arenas in recent years. In the 1990 Gulf War, Iran “helped” the coalition by “not interfering.”<sup>14</sup> During the U.S. war in Afghanistan, Tehran assisted in efforts to form the interim Afghan government at a meeting in Bonn in December 2001. Iran also was relatively cooperative during the early days of the campaign in Iraq, although its long-term intentions are unclear.<sup>15</sup> Iran also is seeking better ties with the European Union (EU), whose long term strategy with Iran focuses on linking into potential economic and political reform there. As starting points, Iran has attained observer status to the EU Energy Charter and is discussing a proposed gas pipeline to Greece.<sup>16</sup>

Still, it remains a possibility that a nuclear Iran could make a threat in political negotiations to use conventional weapons to close the Strait of Hormuz. “Words of warning” from Israeli officials that Tel Aviv could hit vulnerable oil export facilities like Kharg Island and other offshore regions instead of preemptively attacking the Bushier nuclear plant could bring such an issue to the fore, as suggested by Geoff Kemp of the Nixon Center in his monograph, “U.S. and Iran: The Nuclear Dilemma, Next Steps.”<sup>17</sup> In the context of issues discussed in this chapter, Israeli grandstanding against Iranian oil facilities is not constructive to common goals and, in fact, aggravates the issues rather than serving as a deterrent. A threat of this nature has immediate cost ramifications in that it would instantly raise the price of oil, benefiting Iran overnight as it is a major oil exporter, and hurting the United States and its allies in the industrial world who are major oil importers.

Iran traditionally has been a strong advocate for higher oil prices at meetings of the Organization for Petroleum Exporting Countries (OPEC) and is considered a pivotal price hawk leader inside the producer oil cartel, inclined to ignore concerns that soaring oil prices might hurt future oil demand or damage world economic conditions. Its policy history on the subject of oil prices has been relatively consistent since the early days of the Islamic revolution, and Tehran has used its influence when it could to boost world oil price levels

through a combination of public statements, diplomatic initiatives, and outright threats.

In autumn 1984, as an oil price war was looming, influential speaker of the Iranian Parliament Hojjatolislam Hashmi Rafsanjani indicated in a sermon that Iran might attempt to block the flow of oil from the Persian Gulf if oil prices continued to fall, warning if Iran “was one day pressured in a price-cutting war, it will create such a crisis in the region that it will be similar to the days of the revolution and oil would not flow to the other side.”<sup>18</sup> Iran’s minister of oil announced the country would like to see \$25 per barrel oil remain OPEC’s minimum price in the aftermath of the Gulf War and was able to orchestrate a high level political agreement with Saudi Crown Prince Abdullah to boost prices above the traditional \$18 a barrel target price starting in 1999.<sup>19</sup> In recent years, Iran has lobbied within OPEC to keep prices high by pressing the producer cartel to maintain a pattern of pivotal oil production cuts. It has used its leadership position inside OPEC to try to thwart the producer group from raising production during times of market disruptions.

Iran’s economy is highly dependent on oil export revenues, which constitute roughly 80 percent of its total export earnings, 40-50 percent of the government budget, and 10-20 percent of its gross domestic product (GDP). The U.S. Department of State concluded in its 2002 *Patterns of Global Terrorism Report* that Iran remained “the most active state sponsor of terrorism in 2002.” Oil revenue represents a significant portion of Iran’s disposable income. This report concluded that Iran provided Lebanese Hezbollah and Palestinian rejectionist groups, such as HAMAS, the Palestine Islamic Jihad, and the Popular Front for the Liberation of Palestine-General Command, with funding, safe haven, training, and weapons. Iranian funding for Hezbollah was reportedly about \$60 million to \$80 million a year in the 1980s. The report also asserted that Iran provided support to extremist groups in Central Asia, Afghanistan, and Iraq.

The United States first placed Iran on the State Department terrorism list in 1984, in response to allegations of Iranian involvement in the 1983 suicide attack by Hezbollah on the U.S. Marine barracks in Lebanon.<sup>20</sup> Iran was also linked to the bombing of Khobar Towers in Saudi Arabia, where 19 American servicemen were killed. On June 21, the Justice Department announced that it had indicted 13

Saudis and one Lebanese who were members of Saudi Hezbollah. The indictment said that these individuals belonged to groups that were “inspired, supported, and supervised” by elements of the Iranian government.<sup>21</sup> In April 2001, Iran sponsored an international conference supporting Palestinian groups, including groups promoting violence in Israel. In January 2002, a shipment of 50 tons of arms from Iran to the Palestinian Authority was uncovered.<sup>22</sup> The United States maintains economic sanctions against Iran because of its terrorist links, and American firms are not allowed to purchase oil from Iran nor invest in its oil fields.<sup>23</sup>

Political negotiations between Iran and the United States and its allies can result in different outcomes. If the points in the bargaining set dominate a war outcome, both sides, if they are rational, may very well decide to choose to negotiate a solution rather than fight a war. However, if they choose not to bargain or if they cannot agree, then one option open to Iran is to try to block the Strait using conventional force. The United States currently has the ability to attack Iranian missile sites and can, at some cost, reopen the Straits. Iran’s shift to nuclear status most likely would alter its political leverage vis-à-vis conflict with the United States and its allies.

The implications for an Iran that has acquired nuclear capability differs from the above scenarios. It is unlikely that Iran would have nuclear weapons in sufficient number and sophistication that they would use them to attack the United States and its allies. From the Iranian point of view, perhaps the greatest utility to attaining nuclear weapons is to protect its territory from outside aggression, and deny the United States aggressive interference in its internal affairs or at the extreme, an Iraq-style invasion by U.S. or allied troops. Iran also is concerned about the nature of the military balance in its neighborhood, which includes several nuclear powers (Israel, Pakistan, and India). Iran is not expected to deploy an intercontinental ballistic missile capable of striking the continental United States. This means that for Iran even to consider implementing an actual regional nuclear attack, it would have to be able to withstand a massive preemptive U.S. conventional attack, or if Iran used nuclear weapons first in the theatre, a nuclear second strike by the United States. In strategic terms, therefore, it is difficult to see why a rational Iran would use its

nuclear weapons except under dire circumstances where its existence was threatened.

However, it cannot be ruled out that a more radicalized regime in Tehran might pass nuclear material to a terrorist group. Alternatively, should the political climate in the region change, it would be possible for Iran to threaten to use its nuclear weapons as an umbrella to close the Strait of Hormuz. It has been estimated that a 3-month closure of the Strait of Hormuz, without any offsetting oil export procedures or market intervention, could cost the United States a 4 to 5 percent drop in GDP, with up to 2 percent added to the unemployment rate and 7 percent added to the inflation rate.<sup>24</sup>

Bargaining with threats is really a two-stage process.<sup>25</sup> The first stage is explicit bargaining. The second stage, in which the threat point will be implemented should the bargaining process fail, is implicit. The logical difficulty is that such games usually are not subgame perfect. In the bargaining process, it may be optimal to threaten to use nuclear weapons should a player's demands not be met. However, it is unlikely that the player will want to implement its threats. One way to address this problem is through a commitment mechanism. If a player can restrict its freedom of action so that it has no alternative but to implement the threat, then the threat is credible.

Precommitment mechanisms can be subtle.<sup>26</sup> One example would be to transfer control of nuclear weapons to battlefield commanders. This creates the possibility that in the "fog of war," the weapons will be used. The aggressor is forced to try to evaluate the probability that the other side will use its nuclear weapons. If it is a nuclear power, it can invoke the threat point by using the argument in its negotiations that political instability may create the danger that the nuclear weapons may fall into irresponsible hands. Thus, the potential for political instability is itself a form of a precommitment mechanism. A non-nuclear power does not have the advantage of this type of leverage. Given the enormous damage nuclear weapons can inflict, their expected loss can be large, even though the subjective probability of their use is small. Given the political instability of Iran, it would be dangerous to assume that all bargaining would be rational, as there would be the very real possibility that the nuclear weapons would be under the control of the more radical elements of the government.

Since the nuclear threat is credible, the status quo is likely to be stable. Nuclear weapons put the burden of accepting the risk of the threat being implemented on the party that wants to change the status quo. The potential use of nuclear weapons also can change the probability distribution of potential gains and losses from conventional war so as to reduce its expected gain. In fact, a very small probability of enormous loss due to the use of nuclear weapons can change the expected value of a conventional war from positive to negative.

The acquisition of nuclear weapons is thus a means to validate conventional superiority. If a country has both conventional superiority and nuclear weapons, it can use the threat of conventional weapons to achieve the result it desires and use its nuclear weapons to validate this action. This threat would deter third parties from intervening in a regional conflict. Suppose, for example, that Iraq had been a nuclear power in the summer of 1990. Having taken Kuwait, Iraq would have forced the allies to choose between accepting the new allocation, or risking that its threat of using nuclear weapons would be implemented.

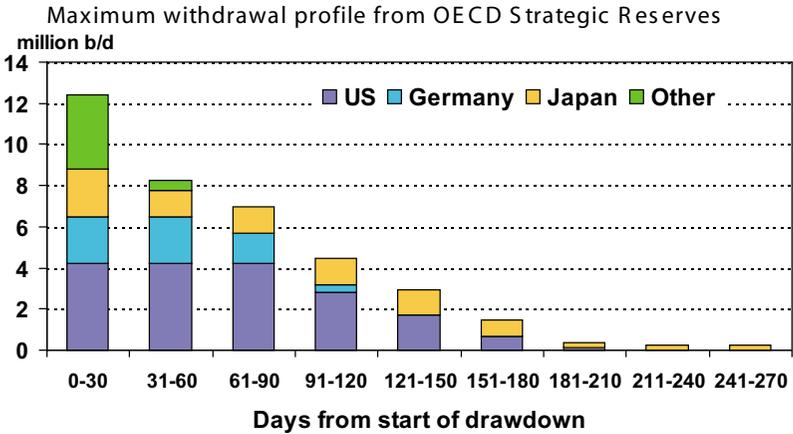
Iran's arsenal of *Silkworm* and *Seersucker* missiles mean that it could use these missiles in an attempt to close the Strait.<sup>27</sup> Under normal circumstances, this would be a problem, but one that could be addressed by U.S. naval power. However, if Iran has nuclear weapons, the nature of the threat to the Strait or other Persian Gulf energy facilities would change. The military problem would be much more complex, as it would be necessary to destroy Iran's nuclear weapons before attacking the conventional forces that are blocking the Strait. Under such circumstances, time becomes a precious commodity, and the ability to buy time by moving Saudi and other Gulf production to the Red Sea and the Mediterranean becomes a key resource.

### **Strategies for Reducing Threats to the Closure of Strait of Hormuz.**

Maintaining alternatives to shipments of Persian Gulf oil through the Strait of Hormuz will be a critical aspect to limiting the economic damage to oil importing countries of a major shutdown of the Strait.

The first line of defense in this regard is the existence of the emergency stockpiling system of the International Energy Agency (IEA) which includes the joint release of oil from U.S. strategic petroleum reserve, together with strategic oil stocks of other Organization for Economic Cooperation and Development (OECD) member states. However, the potential of the IEA strategic stocks is limited, as it can only replace the volume of oil coming through the Strait for less than 30 days. Western industrialized nations likely would have to resort to emergency conservation measures in combination with a major stock release to mitigate the damage of a prolonged closure of the Strait of Hormuz, barring other alternative strategies.

## Emergency Preparedness



Source: IEA

**Table 1.**

Western strategic oil stocks could be supplemented by unsold oil stored near end-user markets by key producers like Saudi Arabia or Russia. Such “floating” stocks were pivotal in stabilizing oil markets in 1990 when Iraq invaded Kuwait.<sup>28</sup> Floating stocks would be beneficial in today’s circumstances and should be considered. However, other alternative strategies do exist that could give the United States and its allies time to pursue a negotiated solution or to properly prepare for a military response. Among those alternatives

are to use existing pipeline and oil export infrastructure to create a bypass to the Strait of Hormuz. The costs and options for doing so have been studied in detail by the James A. Baker III Institute and the Center for Naval Analysis.<sup>29</sup>

One significant existing Strait of Hormuz bypass is the trans-Saudi Arabian Petroline, an oil pipeline that has existing capacity to move over 5 million barrels a day of crude oil from Saudi oil fields to the Red Sea port of Yanbu.

A second pipeline, the Ipsa-2 pipeline, which extends from southern Iraq to the Saudi Red Sea port of Mu'jiz, could be refurbished and adjusted to carry an additional 1.65 million barrels a day of oil from Iraq and Saudi Arabia (and with construction of a spur line, Kuwait) to the Red Sea, bypassing the Persian Gulf. The 1.65 million b/d Iraqi-Saudi (Ipsa-2) pipeline was closed indefinitely by Riyadh during the Gulf War. Although Saudi Arabia has refused to comment on whether it would ever bring the line back on stream, it has maintained its portion in good working order. In June 2001, the kingdom announced that it had taken ownership of Ipsa-2, which was used to export Iraqi crude oil via Saudi Arabia in the 1980s during the Iraq-Iran war. Riyadh said that it was seizing the line, including pumping stations, storage tanks, and the maritime terminal, as Gulf War reparations for Iraqi military actions. Baghdad, for its part, has insisted that it still owns the line and has not accepted the legitimacy of the Saudi appropriation. Utilization of this line would require a diplomatic initiative involving both Saudi Arabia and Iraq.

The capacities of both of these pipelines could be upgraded by 65 percent in the event of a Hormuz incident to 11 million barrels a day by upgrading the lines through the use of drag reduction agents that reduce turbulent eddies in the oil which lessen the volume of oil that can be transported through a pipeline at any given time. Costs of such a project are calculated to be relatively low at around \$600 million. Drag reduction agents (DRAs) are chemicals that are injected into crude oil pipelines to reduce energy loss. DRAs have been used on the Alaskan pipeline, and frequently on the Colombian pipeline system, to make up for lost flows during times of operational interruption. Another option would be to build a spur line from Abu Dhabi and other regional production centers so that oil could exit to world markets via Oman.

Upgrading these pipelines could allow the United States to respond to a closure on a deliberate and risk-minimizing timeline, potentially lessening the need for U.S. military deployment during a crisis. The existence of such contingency options also could be used to reduce Iranian motivation to close the Strait of Hormuz by reducing the political leverage and gain from doing so. Studies show that full use of a bypass option would mean that a closure of the Strait of Hormuz would only result in a loss of U.S. GDP of roughly 1 percent, also mitigating the impact on unemployment and inflation.<sup>30</sup> However, the bypass option only would be effective if Iran did not have the capability to simultaneously threaten the bypass facilities or Saudi Arabian oil production facilities themselves, but focused solely on closing the Strait as its primary target.

The bypass contingency plan described above certainly would be extremely effective against a one-of-a-kind terrorist attack that temporarily affected the passage of oil through the Strait. Rapid public announcement of the planned utilization of bypass routes could be used in combination with strategic stocks to keep oil markets calm during such an event by demonstrating to the markets that Persian Gulf oil will still be made available.

### **High Costs of a Loss of Access to Saudi Facilities.**

While there exist several alternative ways to bypass a loss of access to the Strait of Hormuz, a major attack on Saudi oil production facilities would be harder to counterbalance. Saudi oil export infrastructure has important, substantial built-in redundancies on both the east and west coasts of the kingdom that would make it extremely difficult for terrorist cells or saboteurs to knock out Saudi export capacity for any significant period of time. The same would apply to military attacks by air. The kingdom's export capacity is over 14 million b/d, almost twice as much as current export levels, and a wide variety of facilities would have to be substantially jeopardized simultaneously before any oil export curtailment would be unavoidable. The kingdom also has access to other less well-known offshore loading facilities and makeshift systems, such as single-buoy mooring systems that could be used to load ships for export of Saudi oil.

However, a major attack on core Saudi oil production facilities that significantly affected oil production and handling operations at the major processing facilities at Abqaiq would prove far more difficult to replace quickly. As noted in the Economist Magazine, "Saudi Arabia remains the indispensable nation of oil."<sup>31</sup> Saudi Arabia not only exports more oil than any other producer, it maintains over one million barrels a day of idle swing capacity on hand for emergencies and can, in a relatively short order, bring on new fields to replace the exports of any other single exporter in the world. No other nation currently sits in this important position. The ramifications of Iran or some other nuclear power or group being able to blackmail the West would be quite extreme. A loss of access to Saudi production facilities at Abqaiq would leave world markets with a deficit in the millions of barrels a day (depending on the extent of damage) and would not be replaced easily, even in the 3 to 6-month timeframe when strategic stocks could be used to replace lost Saudi barrels. Certain facilities can take between 1 to 2 years to rebuild on an expedited basis. To lessen the impact of an attack by a terrorist group or others on important Saudi oil processing facilities, construction of some alternative bypass facilities should be considered and implemented where possible, and critical parts for the repair or reconstruction of such oil processing facilities should be stockpiled in country.

In the event of a major attack on Abqaiq facilities, Saudi production eventually could be replaced with investment in new fields in Venezuela, Iraq, Russia, and West Africa, but this process is also likely to take several years. In the meantime, the United States and other large industrial and emerging economies would be forced to restrict the use of oil through rationing and other extreme measures to prevent a full blown market crisis of proportions reminiscent of the crisis of 1973.

## **Conclusion.**

The United States has acted to protect the freedom of navigation of the Strait of Hormuz for several decades. However, military strategies alone may be less effective than a combination of strategic options, should hostile parties in the region acquire WMD and be

willing to use them to threaten core Saudi oil production facilities significantly as a means of deterring a military response to a closure of the Strait.

The United States, through a combination of release of IEA emergency strategic stockpiles, utilization of strategic export bypass facilities, and military operations, could ease any threat or actual blockade to the Strait of Hormuz. For an investment totaling roughly \$600 million, existing pipeline systems in Saudi Arabia could be modified to permit the export of up to 11 million barrels a day of oil to bypass the Strait of Hormuz.<sup>32</sup> Used in combination with the release of strategic stocks, an upgraded bypass system could almost completely offset the loss of oil due to the closure of the Strait of Hormuz for as much as 90 days. Such a strategy would allow the United States to respond to the threat of a closure or an actual closure on a deliberate and risk-minimizing timeline and could limit the extent of military engagement needed. The existence of such contingencies could reduce the Iranian motivation to close the Strait of Hormuz and reduce the political leverage they get from threatening to do so.

However, the effectiveness of this deterrent is reduced under scenarios where Iran is a nuclear power and might consider threatening Saudi oil production surface facilities. A nonconventional attack on certain key Saudi oil production facilities would be extremely difficult to deal with, given the lack of alternative idle production capacity that could be brought on line in other oil producing countries. This extreme case, however, would have to be considered by Iran in the context of a massive U.S. response.

Given all the factors considered in this question, having the ability to by-pass the Strait of Hormuz has two significant benefits. First, it buys time, allowing the United States to move forces into the region to address the Iranian nuclear threat. Second, Iran would have to use its nuclear weapons without provocation; this weakens their position in negotiations. It is one thing to threaten to use nuclear weapons in response to an attack and quite another to threaten to use nuclear weapons if a concession is not made in negotiations. In the latter case, Iran runs high risks of serious consequences that its small nuclear arsenal would not enable it to guard against.

## ENDNOTES - CHAPTER 9

1. See [www.eia.doe.gov/emeu/cabs/choke.pdf](http://www.eia.doe.gov/emeu/cabs/choke.pdf).
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9. See [http://www.nti.org/e\\_research/profiles/Iran/Missile/3876\\_4086.html](http://www.nti.org/e_research/profiles/Iran/Missile/3876_4086.html).
10. See <http://www.converger.com/eiacab/chron.htm>.
11. See [http://www.nti.org/e\\_research/profiles/Iran/Missile/3876\\_4086.html](http://www.nti.org/e_research/profiles/Iran/Missile/3876_4086.html).
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15. Details available in *ibid*.
16. Friedemann Miller, "Why Iran is Key for Europe's Security of Energy Supply," Eugene Whitlock, ed., *Iran and Its Neighbors Diverging Views on a Strategic Region*, SWP Berlin: German Institute for International and Security Affairs, July 2003.
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19. "Iran Hopes \$25/barrel Minimum Price Remains After Gulf Crisis," MEES, Vol. XXXIII, No. 49, September 10, 1990; "Saudi Arabia and Iran See Eye to Eye on Oil Price Issue," MEES, Vol. XLII, No. 21, May 24, 1999.

20. Meghan L. O'Sullivan, "Shrewd Sanctions: Statecraft and State Sponsors of Terrorism," Washington DC: Brookings Institute Press, 2003, Chapter 3.

21. See <http://news.findlaw.com/cnn>.

22. An overview on Iranian terrorism links also is outlined by George Tenet, Testimony given on "Current and Future Threats to National Security," Senate Armed Services Committee, February 2, 1999.

23. For a detailed account of the U.S. oil sanctions policy against Iran, see Meghan L. O'Sullivan, "Shrewd Sanctions: Statecraft and State Sponsors of Terrorism," Washington, DC: Brookings Institute Press, 2003.

24. Estimates are based on the U.S. Department of Energy DIS model and do not cover any ameliorating policies such as the release of the strategic petroleum reserve or utilization of alternative export routes.

25. Dagobert Brito and M. D. Intriligator, "The Economic and Political Incentives to Acquire Nuclear Weapons," *Security Studies*, 1993.

26. *Ibid.*

27. For details on Iran's military capabilities, see Wisconsin Project on Nuclear Arms Control, *Iran Missile Update*, 2004, Risk Report, Vol. 10, No. 2, March-April 2004; also see Al-Alkim.

28. Because of weak markets in mid-1990, Saudi Arabia and Iran held tens of millions of barrels of oil afloat, unsold, that served as a cushion to the sudden loss of Kuwaiti and Iraqi oil production. Throughout the late 1980s and early 1990s, Saudi Arabia maintained a policy of storing oil abroad in the Caribbean and Northwest Europe to make sure it could respond to any sudden disruption in oil markets. See Ronald Soligo, Amy Myers Jaffe, and Peter Mieszkowski, "Energy Security," working paper, The Political, Economic, Social, Cultural and Religious Trends in the Middle East and the Gulf and Their Impact on Energy Supply, Security and Pricing, available at [www.rice.edu/energy](http://www.rice.edu/energy).

29. For a detailed study of this subject which is the basis for this section of this chapter, see M. Webster Ewell, Jr., Dagobert Brito, and John Noer, "An Alternative Pipeline Strategy in the Persian Gulf," available at [www.rice.edu/energy](http://www.rice.edu/energy), under Research/Other Publications and Presentations. A classified version of the study also exists that should be revisited by policymakers, given the risks to Persian Gulf facilities described in this chapter.

30. *Ibid.*

31. "What If?" *The Economist*, May 29, 2004, p. 69-70.

32. Ewell, Brito, and Noer.