مركز الدراسات الإستراتيجية
الجامعة الأردنية

مركز الدراسات الاستراتيجية
الجامعة الأردنية

Center for Strategic Studies
University of Jordan

www.jcss.org

هاتف: ٥٣٥٥٦٦٦ (٦ ٩٦٢)
فاكس: ٥٣٥٥٥١٥ (٦ ٩٦٢)

Tel.: 962 6 5300100
Fax: 962 6 5355515

css@css-jordan.org

CSS
Papers

Blinded by the Bomb: The Strategic Priority of the Iranian Conventional Missile Arsenal

Mahjoob Zweiri

Center for Strategic Studies
University of Jordan

October, 2009

Introduction

The international community's primary anti-proliferation efforts vis-à-vis Iran's ongoing weapons programs have focused on Tehran's development of nuclear weapons and fissile material. Indeed so great is the fear of an Iranian bomb that Israel and the United States have maintain a state of readiness for a first strike against Iranian nuclear facilities.[1] There is however evidence to suggest that the primary Iranian strategic deterrent –and hence US and Israeli strategic priority- is not a clandestine nuclear program, but rather the Islamic Republic's conventional surface-to-surface (SSM) and anti-ship cruise missile arsenals.

This study will seek to 1) catalogue known Iranian SSM and anti-ship cruise missile systems 2) identify the strategic threat, retaliatory scenarios, and primacy of fixed and mobile conventional missile launching systems over weapons of mass destruction (WMD), and 3) determine what a conventional SSM centered Iranian defense strategy means for Israeli and US tactical first strike capabilities and strategic options. In conclusion this study will attempt to establish that the international community's narrow focus on Iranian WMD development is in part misguided, having overlooked the strategic priority of Iran's growing conventional missile arsenal.

I. The Iranian Conventional Missile Arsenal

Iran's abandonment of nuclear warhead development, as reported in the 2007 US National Intelligence Estimate, was followed by a corresponding numerical expansion and technological advancement of its conventional missile arsenal.[2] Although this apparent reprioritizing of weapons development could simply be the overt delivery technologies facet of a clandestine WMD production program, it may also suggest a change in Iranian defense strategy. This new SSM centered Iranian defense strategy would emphasize Iran's growing conventional missile arsenal.

Iran's conventional missile arsenal primarily consists of 1) liquid and solid fuel SSM launched from mobile and fixed platforms, and 2) advanced Russian and Chinese anti-ship cruise missiles designed to defeat US naval vessels. The Iranian conventional missile arsenal primarily consists of the following known SSM and cruise missile weapons systems:

Sajil 1 and 2

The Sajjil 1 is a two-stage solid fuel rocket that was tested by the Islamic Republic of Iran on November 2008 and said to make use of more advanced guidance systems than the Shahab 3. It is not a continuation of the Shahab 3 line, and does not resemble the North Korean two-stage TaepoDong series. The Sajjil 1 is said to have a range of 2,000km. A second launch dubbed Sajjil 2 was tested on May 2009, with range between 2,000 to 2,500km. The type enjoys rapid acceleration and smaller logistical footprint than its Shahab. 3 predecessors.[3]

1. While the US maintained a state of readiness for a first strike against Iran under the Bush Administration, Israel has actively developed advanced bunker-busting capabilities and trained for such an operation. See Mahnaimi, Uzi, and Sarah Baxter. «Revealed: Israel plans nuclear strike on Iran.» Times UK. http://www.timesonline.co.uk/tol/news/world/article1290331.ece.
2. US Director of National Intelligence. «National Intelligence Estimate: Iran, Nuclear intentions and Capabilities.» http://www.dni.gov/press_releases/20071203_release.pdfhttp://www.dni.gov/press_releases/20071203_release.pdf.
3 BBC. «Iran tests new long-range missile .» http://news.bbc.co.uk/2/hi/middle_east/7725951.stm.

Center for Strategic Studies-University of Jordan Tel:962 6 5300100 Fax:962 6 5355515
Email: css@css-jordan.org

The Sajil-2 is the most advanced two-stage SSM in the Islamic Republic's conventional missile arsenal. The Sajil-2 is entirely powered by solid-fuel, which makes the weapon smaller, faster, and more difficult to intercept. The missile has a 2,000 kilometer range.[1] The Sajil-2 is equipped with a more advanced guidance package than the Sajil-1 and Shahab missile series, and can be launched in «quick succession.»[2]

Shahab 2 – 4

Derived from the North Korean No-Dong and Soviet Scud missile systems, the Shahab series missiles have a low accuracy rate compared to the Sajil-1 and 2. Also known as the Scud-C, the liquid-fuel, single-stage Shahab-2 is a short-range truck-based SSM with a 500 kilometer range and 700 kilogram payload.[3] The medium-range Shahab-3 can be launched from fixed subterranean missile silos as well as mobile truck-based platforms, and is capable of delivering a 1,000 kilogram payload 1,300 kilometers.[4]

The Shahab-3A is a lighter variant of the Shahab-3, with a decreased range of 1,800 kilometers. The liquid-fueled Shahab-3B has a range of 2,500 kilometers, and is capable of striking Israel, Turkey, and US forces in the Middle East. The Shahab-4, a missile with a 2,000 kilometer range and 750-1000 kilogram payload, is rumored to be in an advanced stage of development.[5]

Zelzal and Fateh A-110

The Zelzal is a short-range solid-fuel missile with a 210-300 kilometer range and 600 kilogram payload. The Zelzal is capable of fire form a multiple launch system.[6] The solid-fuel Fateh A-110 has a 210 kilometer range and 500 kilogram payload capacity.[7]

Chinese C-802 and Iranian improved derivative 'Noor'

In the wake of the 1991 Gulf War, Iran acquired 60 Chinese-manufactured Yingji-82 anti-ship cruise missiles. The Yingji-82 export model is classified as the C-802. Due to the C-802 missile's minimal radar cross-section, extremely low attack flight-path, and advanced anti-jamming capability, the C-802 has a first-shot hit probability as high as 98%. C-802 missiles are deployed in coastal batteries on the strategically important Qeshm Island, located on the Eastern side of the Arabian Peninsula.[8] The ***Noor*** may also be fired from Iran's Soviet-built Su-24MK and F-4D/E strike aircraft or helicopters. The Iranian variant, known as Noor has an extended range of 200km.

Moskit/SS-N-22 Sunburn

With an attack flight-path of only ten meters above the sea surface, and a top speed of Mach 3, the Russian-manufactured SS-N-22 Sunburn is considered one of the most lethal anti-ship cruise missiles in the world. The nuclear-capable SS-N-22 can deliver a 320 kilogram payload to targets within a 220 kilometer range.

1. http://www.theisraelproject.org/site/c.hsJPK0PIJpH/b.2400213/k.61B6/Irans_Nuclear_Capacities.htm
2. BBC. «Iran's Arsenal of Missiles.» http://www.theisraelproject.org/site/c.hsJPK0PIJpH/b.2400213/k.61B6/Irans_Nuclear_Capacities.htm.
3. Chaudry, Ali. «Iran's Ambitious Missile Programs.» Iran Watch Center for Defense Information. http://www.iranwatch.org/privateviews/CDI/perspex-cdi-missileambitions.htm.
4. Ibid.
5. Federation of American Scientists. «Shahab 4.» http://www.fas.org/nuke/guide/iran/missile/shahab-4.htm.
6. Missile Threat. «Zelzal 1/2/3.» http://www.missilethreat.com/missilesoftheworld/id.177/missile_detail.asp.
7. Ibid. «Fateh A-110.»
8. Global Security. «C-802.» http://www.globalsecurity.org/military/world/china/c-802.htm.

Center for Strategic Studies-University of Jordan Tel:962 6 5300100 Fax:962 6 5355515
Email: css@css-jordan.org

Upon launch, the weapon cruises at sub-sonic speeds until within ten nautical miles of the intended target, upon which a rocket-propelled warhead separates and accelerates to three times the speed of sound, giving target ships between 25 and 30 seconds to respond. The missile has the potential to perform advanced evasive maneuvers, including sharp angle strafes and dodges. Russia offered the SS-N-22 for sale to Iran in the mid-1990's.[1]

Kh-55 (NATO designation AS-15)

This 2,000 – 3,000 km (depending on variant) a nuclear capable sub-sonic cruise missile was designed primarily to attack land and ship targets. It is the Russian equivalent to the United States> 'Tomahawk' cruise missiles. The 'Tomahawk' was used extensively in virtually all US conflicts during and since the 1991 Gulf War. According to the Financial Times, Ukrainian prosecutors discovered 12 were transferred[2] to Iran from the Ukraine in 2001. The type can be launched from land, sea or air targets. Although Iran has not deployed it or developed a comparable weapon, the Kh-55 could form the basis for a future high-subsonic cruise missile. So far the weapon or any of type similar performance not been presented.

II. The Strategic Threat and Priority of the Iranian Conventional Missile Arsenal

The above enumerated SSM and anti-ship missiles represent only a portion of the Iranian missile arsenal. Questions remain as to the exact number of missiles, new indigenously developed and internationally acquired variants, and the location of fixed missile silos and mobile launch platforms. Also in question is the minimum launch time between missile waves, and the extent of short-range missile proliferation to Iranian proxies like Hezbollah and Hamas.

With such a dearth of actionable intelligence, the extent of the strategic threat posed by the conventional Iranian missile arsenal is great, particularly towards Israel. As reportedly stated by Dr. Seyed Safavi, head of the Research Institute of Strategic Studies in Tehran and advisor of Supreme Leader Ali Khamenei, the targets of Iranian missile launches would be Israel regardless of the origin of a first strike against Iran.[3] Considering Israel's relatively small territory and population, an intensive Iranian missile barrage would be devastating –one need only recall the psychological havoc wrecked by relatively primitive Iraqi Scuds and unguided Palestinian Qassam rockets.

Regarding the Iranian anti-ship cruise missile capability, it is worth mentioning that the C-802 and SS-N-22 Sunburn missiles were designed specifically to neutralize US naval hegemony. As such Iranian C-802 and SS-N-22 Sunburn deployment in the Persian Gulf would severely limit Israeli and assisting US naval operations. As of yet, no defense capable of neutralizing the C-802 and SS-N-22 threat –considered so great a danger that the head of the Pentagon's defense testing department moved to block the development of any new carrier projects until the cruise missile threat was addressed.[4]

1. Global Security. «Moskit/SS-N-22 Sunburn.» http://www.globalsecurity.org/military/world/russia/moskit.htm.
2. Financial Times «Ukraine admits exporting missiles to Iran and China» http://www.ft.com/cms/s/0/abf8cc64-9753-11d9-9f01-00000e2511c8.html?nclick_check=1
3. Haaretz. «Top Iran Officials Recommend Preemptive Strike Against Israel .» http://www.haaretz.com/hasen/spages/1030279.html.
4. Cappacio, Tony. «Navy Lacks Plan to Defend Against Sizzler Missile.» Bloomberg. http://www.bloomberg.com/apps/news?pid=20601070&sid=a5LkaU0wj714.

Center for Strategic Studies-University of Jordan Tel:962 6 5300100 Fax:962 6 5355515
Email: css@css-jordan.org

Iran is unlikely to strike Israel or US interests in the region however unless attacked first. The isolated, Shi'a regime lacks the international and regional support to undertake an unprovoked first-strike against Israel or US interests. Tehran lacks legitimacy -especially in the wake of the recent election crisis. A US or Israeli first strike against Iran's nuclear or SSM missile installations would however vindicate the position of hardliners within the Iranian regime, as well as galvanize regional support, thus providing the international legitimacy for an Iranian military campaign against Israel and US interests in the region.[1] For what is a nation with a proud history of regional domination, a first strike would not go unpunished, or without political and strategic capitalization.

In the event of a joint or individual US or Israeli first strike, Iran will most likely target Israel directly through its conventional missile arsenal, and indirectly through regional proxies like Hamas and Hezbollah. Iran will only attack US forces and interests in the region if the US is perceived to have colluded with a Israeli first strike. It would however be difficult for Israel to act alone; technological and logistical challenges notwithstanding, Israeli aircraft would at the very least need US approval to cross Iraqi airspace in order to bomb Iranian missile and nuclear installations.

Thus an Iranian retaliatory strike may not only consist of an intensive missile barrage and activation of Hezbollah and Hamas against Israel, but also of indirect attacks against an abetting US. Indirect attacks against US interests and forces in the region may consist of an economically damaging cut in international oil exports, a blockade of the critical straits of Hormuz, and a ratcheting up of the violence against American troops in Iraq through Shi'a militia proxies.[2] US naval forces in the Persian Gulf, if believed to be directly supporting Israeli military action, would be at risk of –and defenseless against- a SS-N-22 and C-802 cruise missile barrage. As discussed, the above delineated strategic threat of the Iranian conventional missile arsenal carries a significant tactical advantage over WMD.

First, Iran is at a strategic disadvantage regarding WMD capability. Although the Islamic Republic may be able to rapidly weaponize its advanced civilian bacteriological and chemical production infrastructure, it is doubtful Iran could immediately assemble a fission bomb arsenal in the event of an armed conflict with thermo-nuclear Israel. As such a focus on purely conventional weapons would minimize the possibility of any future conflict with Israel escalating into a unilateral nuclear strike, which would endanger the survival of the Iranian regime and nation. An Israeli nuclear strike against conventional Iranian forces or urban centers would be met with worldwide opposition and a possible end to critical US financial, military, and diplomatic support, thus preventing an Israeli nuclear strike. As Israel lacks the power projection capabilities to engage Iran in a wide-scale ground conflict, it would have to rely on a similar SSM based deterrent in the absence of the nuclear option, leaving Israel at a disadvantage.

1. Benn, Aluf. «U.S. puts brakes on Israeli plan for attack on Iran nuclear facilities.» Haaretz. http://www.haaretz.com/hasen/spages/1010938.html.
2. Lake, Eli. «Iran's «Nightmare Scenarios» are Mulled in Washington.» The New York Sun. http://www.nysun.com/foreign/irans-nightmare-scenarios-mulled/80568/.

Center for Strategic Studies-University of Jordan Tel:962 6 5300100 Fax:962 6 5355515
Email: css@css-jordan.org

Second, short range SSM are easier to proliferate to regional proxies, and are effective weapons systems when deployed against targets within operational ranges. As of 2004, Iran was reported to have transferred 220 Zelzal missiles to Hezbollah, as well as an unspecified quantity of C-802's.[1] During Israel's 2006 war with Lebanon, Hezbollah launched Zelzal strikes against Israeli cities, and used an Iranian C-802 anti-ship cruise missile to seriously damage an Israeli Saar-5 class ship.[2] Should Hamas and Hezbollah launch SSM against Israel again, it would be unlikely that Iran would be targeted for its proliferation violations –unlike what would occur should Iran transfer WMD for use against Israel. Short-range SSM like the Tondar 69, Zelzal, and Fateh -weapons useless when launched from far-away Iran- become a strategic asset when in the hands of regional proxies, resulting in a de-facto expansion of the Iranian medium and long-range SSM arsenal. In each enumerated case of effective weapons proliferation and operational use, SSM are as useful as WMD.

Third, the conventional capabilities of the Iranian SSM and cruise missile arsenal equal that of a WMD centered defense program. WMD, although of great psychological impact and environmental degradation, nonetheless do exactly what conventional weapons do when used on a wide enough scale –kill people in great numbers. One need only remember the intensive Allied bombing campaigns of Dresden and Tokyo that killed nearly as many people as the Hiroshima and Nagasaki atomic bombings. Repeated missile barrages against Israel would devastate the tiny nation. With regard to the US, the Iranian cruise missile salvos can target and destroy US navel vessles, limiting any potential ground strikes from naval weapons platforms in the Persian Gulf. A destruction of US carriers in the Persian Gulf would tarnish US naval prestige and threaten US naval hegemony, now proven vulnerable to our rivals Russia and China's missile technology.

In each case of 1) maintaining an effective deterrent that limits Israeli nuclear strike options against conventional forces, 2) untraceable proliferation to regional proxies, and 3) outright operational capabilities, Iran has found an effective alternative to a WMD centered defense strategy. Considering the operational capabilities of the Iranian SSM and cruise missile arsenal, there is no reason why the Iranians should rely on WMD development in the face of constant international pressure and sanctions. It's the missiles -not the nuclear program- that the West has failed to concentrate on. So if the Iranian missile should be our strategic priority, what does this mean for Israeli and US first strike options and capabilities?

III. Israeli and US first Strike Capabilities and Strategic Options

Let's start with the most likely potential target of an Israeli or US first strike: The Iranian nuclear program. The known elements of the Iranian nuclear program are centered at the Bushehr light water and Arak heavy-water reactor compounds, and the Natanz uranium enrichment facility. Each element of the Iranian nuclear program must be neutralized simultaneously for a successful first strike. If any of the three known compounds are left intact –each hardened facilities resistant to the latest bunker-buster missile technology- hardliners within the Iranian regime may push for the crash development of a fission weapon, which could take as little as six-months if the Iranians are in possession of sufficient weapons-grade uranium.[3]

1. Missile Threat. «Zelzal 1/2/3.» http://www.missilethreat.com/missilesoftheworld/id.177/missile_detail.asp.
2. Global Security. «C-802.» http://www.globalsecurity.org/military/world/china/c-802.htm (7 October 2009).
3. Ibid. «Natanz: Iran Special Weapons Facilities.» http://www.globalsecurity.org/wmd/world/iran/natanz-fep.htm.

In short, a first strike against the Iranian nuclear program would not be as simple as the attacks against the Iraqi and Syrian reactor compounds in 1981 and 2007.

It is however the Iranian missile arsenal that should be our strategic priority –not its nascent nuclear program. As difficult as a first strike would be against the clandestine Iranian nuclear program, a comprehensive strike against Iranian missile facilities is perhaps beyond Israeli or even US capabilities. Simply as a matter of intelligence, the number and location of Iranian fixed missile silos is unknown, as are the whereabouts of the numerous of mobile truck-based Shahab and Sajil missile launch platforms. The dispersed nature of Iranian defenses renders their location and destruction extremely problematic.[1]

A first strike capable of crippling the Iranian SSM launch capability would thus have to be far wider than a surgical anti-WMD program attack, and would open the door to a regional conflict on a greater scale than originally envisioned –a comprehensive attack against the ubiquitous Iranian missile sites would mean general war. Consequently, US and Israeli first strike options and capabilities are limited due to the widespread nature of the Iranian SSM defenses, a dearth of intelligence on silo and mobile launch platform locations, as well as the increased prospect of regional war that would unleash the wrath of Iran's SSM and cruise missile arsenal.

Aside from a first strike, what then are some US and Israeli strategic options for dealing with the Iranian conventional missile threat? First, the US and Israeli should move to implement and strengthen new and existing missile control regimes. In contrast to WMD, there is a noticeable lack of international legislative mechanisms controlling missile development, testing, and production. A limited effort has been made to address «delivery technologies» (see Treaty on the Non-Proliferation of Nuclear Arms and United Nations Security Council Resolution 1540), however international arms control treaties have largely neglected the growing threat of ballistic and cruise missile proliferation.[2]

An international effort to implement missile test restrictions, eliminate existing holdings as part of a global anti-missile initiative, and clarify and expand NPT and UNSCR 1540 terms regarding delivery technologies proliferation, could help mitigate the threat posed by the Iranian conventional missile arsenal. As proven by existing US and Russian agreements, an anti-missile regime is indeed feasible; adherence to a silo construction ban can be verified by satellite, and destroyed missile stocks can be confirmed under international inspection agreements.[3] Although the Missile Technology Control Regime (MTCR) has helped limit sensitive missile technology exports, it has not for example stopped Iran's acquisition of advanced Russian and Chinese cruise missiles –an export item the US must immediately address and condemn.[4]

1. JCPA. «Iranian Missiles: The Nature of the Threat.» http://www.ujc.org/page.aspx?id=44488.
2. UN. «Treaty on the Non-Proliferation of Nuclear Weapons.» http://www.un.org/Depts/dda/WMD/treaty/. For UNSCR 1540, see http://daccessdds.un.org/doc/UNDOC/GEN/N04/328/43/PDF/N0432843.pdf?OpenElement.
3. Hagen, Regina. «Missiles, Missile Defense, and Space Weaponization.» International Network of Engineers and Scientists Against Proliferation.
4. Ibid.

In addition to controlling ballistic missiles through international treaties, the US and Israel should provide economic and political incentives and regional security guarantees in order to reduce Iran's reliance on its conventional missile arsenal. The Iranian regime is far from monolithic, and as the recent election crisis confirmed, comprised of dissatisfied elements. Beset by a thirty percent unemployment rate and double-digit inflation, Tehran's young and restive population would welcome economic and political incentives in exchange for concessions on Iran's missile agenda.[1] Regional security guarantees would also help address paranoia motivating Iranian missile development. The 2001 and 2003 US-led invasions of Iraq and Afghanistan lent a palpable immediacy to US calls for regime change in Iran. An end to Israeli and US talks of first strikes and demonization of Iranian intentions, combined with concrete security guarantees, would help minimize Iranian fears, and hence costly maintained of a martial state.

Conclusion

It seems that the Iranian reprioritization of weapons development away from WMD programs and towards an expansion of its indigenously manufactured and internationally acquired SSM and cruise missile arsenal signals a shift in Iranian defense policy. This policy is missile rather than WMD centered, and is no less effective considering the relative ease of deploying and proliferating SSM and cruise-missiles as opposed to WMD, as well as the comparable destructive capability when used on a massive scale.

That Iranian SSM and cruise-missile weapons systems are so widely deployed severely limits US and Israeli first strike options, which hard pressed to even strike the limited Iranian WMD program, are even less prepared to widen the attack to include a country-wide bombing of Iran's SSM network. A more effective strategic option would be to 1) implement and enforce new and existing anti-missile proliferation efforts, and 2) provide regional political and economic incentives to limit Iranian missile development. The West, blinded by its single-minded focus on an Iranian bomb, has missed the greatest military threat posed by the Islamic Republic: its missiles.

1. Berman, Ilan. «Why Tehran Wants the Bomb.» The American Spectator, June 2007, 15-17.

Center for Strategic Studies-University of Jordan Tel:962 6 5300100 Fax:962 6 5355515
Email: css@css-jordan.org