BEYOND THE "BOMB IN THE BASEMENT": ISRAEL'S NUCLEAR PREDICAMENT AND POLICY OPTIONS

Michael Raska

Can Israel live in a "nuclear balance of terror" with Iran? Should Israel open a Pandora's Box and modify its long-held policy of nuclear opacity: never admitting nor denying its possession of nuclear weapons? If so, under what conditions, in what form, and what direction? What options does Israel have in preparing for the "day after" if Iran indeed crosses the "point of no return" and attains nuclear weapon capability? Or will Israel ensure that the "day after" will never come?

This paper argues it is unlikely that Israel will accept the possibility of nuclear weapons in the hands of Iranian leaders. In particular, Israel's defense policy choices - defensive at the strategic level, but offensive at the tactical level - will likely continue to reflect Israel's historical experience, evolving threat perceptions, and its military capabilities. However, with increasing risk of regional nuclear proliferation, Israel will also have to prepare to review its nuclear deterrent options. In the process, it will likely confront the complexity in revising its nuclear doctrine, and move beyond the simple dichotomy of the "bomb in the basement" versus the "bomb on the table" debate.

Introduction

> Ambiguity is not a bomb, ambiguity is an attitude and if the ones who want to destroy Israel have an ambiguous fear it is ok. Then you don't need bombs.
>
> Shimon Peres, Israeli Prime Minister (1984-86 / 1995-96)

Throughout the Cold War, Israel was able to prevent the proliferation of nuclear arms in the Middle East. A policy of nuclear opacity (*Amimut* in Hebrew) - whereby never admitting nor denying its possession of nuclear weapons - has been at the core of Israel's deterrence. The policy was spontaneously conceived in 1963 when then deputy Defense Minister, Shimon Peres, was bluntly confronted by United States' President John F. Kennedy: "Are you making an atom bomb?" (Karpin 2006, 251). Peres responded, "I can say to you clearly that we shall not introduce atomic weapons into the region. We will certainly not be the first to do so" (Mitnick 2006, 1). In 1966, Israeli Prime Minister Levi Eshkol refined the country's nuclear policy through the Knesset to a declaratory formula which has remained intact to the present day: "Israel will not be the first to introduce nuclear weapons in the Middle East" (Rosen 1977, 1367).

Michael Raska is a PhD student at the Lee Kuan Yew School of Public Policy, National University of Singapore. He specializes in international security, defence transformation, and political-military dynamics of weapons of mass destruction. This article reflects insights he gained in Israel as a visiting research fellow at the Hebrew University of Jerusalem.

In 1981, after the annihilation of Iraq's nuclear reactor, Osirak, at Tuwaitha by Israeli warplanes, Prime Minister Menachem Begin proclaimed, "under no circumstances would we [Israel] allow the enemy to develop weapons of mass destruction against our nation. We will defend Israel's citizens, in time, with all the means at our disposal" (Israel MFA 1981). Under the "Begin Doctrine", as it became known, Israel would not allow itself to be the second country to introduce nuclear weapons in the Middle East.

A quarter of a century later, the viability of both the Begin Doctrine and the state's policy of nuclear opacity are confronted with another test. Iran is gradually defying international diplomatic pressure and moving closer to producing highly enriched uranium – a critical stage for developing nuclear weapons (Albright 2006). Concerns over Iran's covert efforts to develop its nuclear weapon capability, a claim that Tehran denies, are amplified by the development of its medium-range ballistic missile program (Shehab III), and an open call by its leaders for Israel's destruction. In translation from Farsi, Iranian President Ahmadinejad said, "the regime occupying Jerusalem should be eliminated from the pages of history" (BBC 2006).

For Israel, the essence of the emerging Iranian threat is the increasing convergence between radical Islamist ideology, long-range missile capability, and nuclear weapons (Inbar 2005). This poses several challenges and questions for Israeli policy-makers. In particular, can Israel live in a "nuclear balance of terror" with Iran? Should Israel open Pandora's Box and modify its long-held policy of nuclear opacity of a "bomb in the basement"? If so, under what conditions, in what form, and in which direction? What alternative options does Israel have to prepare for the "day after" if Iran indeed develops nuclear weapons? Or will Israel ensure that the "day after" will never come?

This article attempts to provide some, albeit partial, answers to these questions. It argues that Israel will unlikely accept the possibility of nuclear weapon proliferation in the Middle East, particularly in the hands of its standing or potential adversaries. Israel's defence policy choices - defensive at the strategic level, but offensive at the tactical level - will likely continue to reflect the country's historical experience, evolving threat perceptions, and its military capabilities. In this context, Israel may attempt to use force to deny Iran and/or other neighbouring states with similar goals to develop their nuclear weaponry capabilities. As Inbar (2005) noted, while preventive military action would inevitably carry considerable political and strategic risks, inaction may yield far worse consequences.

At the same time, Israel will be discreetly preparing for the "day after", quietly reviewing its nuclear deterrent policy options. First, Israel will likely move toward developing a second-strike nuclear capability by integrating its nuclear weapons into a limited strategic triad that would allow launching nuclear warheads from the air, land, and sea. Second, it will continue to strengthen its defense cooperation with the US, particularly on the multi-layered anti-ballistic missile program (Arrow), space-based Ofeq intelligence satellite system, and other emerging advanced platforms. This can serve to counter both a potential missile threat as well as amplify intelligence surveillance capabilities. Finally, and on a strategic level, it will be quietly reviewing options for a possible open nuclear doctrine and the modalities of its use. In

this context, Israeli policy makers will have to confront the complexity of devising a nuclear doctrine thus moving beyond the dichotomy of the "bomb in the basement" versus the "bomb on the table" debate. Ultimately, Israel will have to decide when, how, and how much to disclose in order to maximize its nuclear deterrence policy.

According to General Moshe Ya'alon, former Chief of Staff of the Israel Defense Force (IDF), Israel now stands in the crossfire of two extreme threats: (1) a sub-conventional low-intensity conflict against terrorism on one hand, and (2) supra-conventional threat emanating from long-range ballistic missiles and potential regional proliferation of WMD on the other. The sum of all fears is the possible nexus of these two hybrid threats – a hostile state with extremist ideology [Iran] acquiring an offensive nuclear capability and providing its nuclear umbrella to its terror proxies [Hezbollah] or deliberately threatening Israel's destruction (Ben-David 2004).

Understanding Israel's Nuclear Option

The existence of an undeclared Israeli nuclear arsenal can be understood in the framework of prevailing historical lessons stemming from its war experiences and lessons from the Holocaust: the belief that Israel is fending for its survival alone. This belief has essentially shaped Israel's strategic choices. Since its inception in May 1948, Israel's core belief was that it could not alter the intentions of its neighbours per se, but could only affect their capability to carry out those intentions. Thus, at the core of Israel's defence strategy is deterrence – to discourage adversaries from particular courses of action by instilling fear or doubt that the cost of such action would far outweigh its potential gain.

In particular, Israel's security policy has been traditionally defensive – to prevent the outbreak or escalation of war with the neighbouring Arab states; and to ensure their acceptance of Israel's existence. If, however, deterrence has failed or when Israeli security was endangered, Israel has used offensive tactics, i.e. initiating rapid preventive or pre-emptive warfare by transferring war into enemy territory, using speed, precision, and firepower; pursuing the "surprise" element. Ultimately, from an Israeli perspective, Israel had no choice (*Ein brera* in Hebrew) but to pursue peace through military superiority. As Cohen (1999) noted, "the response to Israel's security problems did not lie in diplomacy, but in an activist defence policy based on a deterrence posture Israel would develop on its own. A nuclear option would be central to this posture".

The utility of nuclear opacity in Israel's defence strategy can be ascertained from the magnitude of its influence on other nations' perceptions, strategies, and actions (Cohen 1999). The secrecy that Israel has maintained on its nuclear program, and its perceived ambiguity, have created much suspicion and speculation abroad of Israel's possession of nuclear weapons (Rosen 1977). This "bomb in the basement" has enabled Israel to successfully navigate through the conundrums of the Cold War's nuclear age, deterring Soviet intervention in Arab-Israeli wars, as well as providing an "equalizing" insurance policy of last resort vis-à-vis surrounding, quantitatively superior Arab

armies (Hough 1997). Many also believe that Israel's deliberate nuclear ambiguity has brought about open peace talks with Egypt (1979) and Jordan (1994). ©

Most importantly, under the "bomb in the basement" policy, the absence of overt nuclear testing, Israel was able to evade the nuances of international arms control treaties, sanctions, and inspections designed to prevent the proliferation of nuclear weapons. In particular, Israel has not signed the 1970 Treaty on the Non-Proliferation of Nuclear Weapons (NPT). Israel has also evaded the US Arms Export Control Act (1976), specifically the Symington Amendment, which "prohibits most U.S. economic and military assistance to any country delivering or receiving nuclear enrichment equipment, material, or technology not safeguarded by the International Atomic Energy Agency" (Blanche 1999, 25).

Overall, Israel's policy of nuclear opacity has served its security by: (1) deterring conventional attacks by enemy states; (2) deterring all levels of unconventional attacks (chemical, biological/nuclear); (3) pre-empting enemy state nuclear attacks, if deterrence fails; (4) supporting conventional pre-emption against enemy state nuclear assets to deter enemy's counter-retaliation; (5) supporting conventional pre-emption against enemy non-nuclear assets; (6) to undertake nuclear war-fighting, if deterrence fails; and (7) ultimately, projecting nuclear weapons for the "Samson Option" – an all-out destruction of all enemy's population centres, and subsequent self-destruction (Beres 1996).

Israel's Threat Perceptions

Since the end of the Cold War, Israel's threat spectrum, and the sources and nature of the threats, have been shifting compared with earlier decades. Israel's defence strategy has traditionally distinguished two types of security: "basic or fundamental security" (*bitachon yisodi*) and "current security" (*bitachon shotef* or in *short batash*). The former has been referred to major conventional wars – real and potential that stipulated essential risks for Israel's existence; the latter represented terrorist attacks, border skirmishes, and intrusions that harmed, but did not seriously threaten the existence of Israel. In the conventional arena, Israel has distinguished three types of military commitments, the so-called "circles of defence": (1) perimeter (inner ring), (2) intra-frontier, and (3) remote commitments (outer ring). Perimeter defence denoted conventional military warfare vis-à-vis large standing Arab armies in the immediate vicinity of Israel's frontiers; intra-frontier commitments referred to defence within Israel's territory principally against Palestinian terrorists, and remote military commitments stipulated contingencies and threats in a considerable distance from Israel (Cohen 1992).

While the probability of a conventional war with the "inner ring" countries has diminished in the last decade (with the exception of Syria), the development of long-range ballistic missiles in conjunction with regional asymmetrical threats (Weapons of Mass Destruction, or WMD) has enabled the "outer ring" countries, primarily Iran, to directly threaten Israel (Inbar 2002). Clearly, Israel's conventional qualitative superiority has been offset by the increasing asymmetric WMD capabilities of neighbouring countries. Syria, Libya, and

Egypt have also been producing chemical-warfare agents and posses the capability to deliver chemical weapons by bombers or surface-to-surface missiles on targets in Israel (Barnaby 1996).

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With the looming risks of "point of no return" (Iran crossing the technological threshold of developing a nuclear weapon capability), Israeli policy makers cannot accept a nuclear balance of terror with Iran. First, a nuclear Iran would represent an existential threat to Israel's security by linking radical Islamic regime, long-range missile capability, and nuclear weapons. Israel's small and dense population is exceedingly vulnerable to a nuclear attack (Inbar 2006). Second, a nuclear Iran could embolden radical Arab groups as well as more moderate Arab states into acting more aggressively vis-à-vis Israel. Third, a nuclear Iran would open a Pandora's Box of a regional nuclear arms race: Iranian efforts to develop nuclear capability are already igniting nuclear fears in the neighbouring states; Saudi Arabia, Egypt and Turkey have recently announced plans to start their own civilian nuclear programs under the auspices of the IAEA (New York Times 2007). Fourth, a nuclear Iran would effectively negate Israel's advantage in conventional deterrence, freedom of action, and military superiority. In the words of Parsi (2006, 34) "it would not only end Israel's (nuclear weapons) monopoly in the Middle East, it will also shake a fundamental tenet of Israel's military doctrine – the idea that Israel can only survive in the Middle East by maintaining military superiority". Fifth, a nuclear Iran would solidify its regional hegemony aspirations as well as enhance its control of the region's energy resources.

However, assessing the timeframe of the "point of no return" as to when Iran would de facto cross a particular technological threshold, or actually attain nuclear weapons and mount them on its long-range surface-to-surface missiles, remains unclear. The range of available estimates attempting to ascertain how advanced the Iranian nuclear program really is indicates there is no clear authoritative assessment (Landau 2007). For example, in December 2005, Meir Dagan, Chief of the Mossad, Israel's intelligence arm, warned that Iran's nuclear power threshold could be realized within a few months. Other high-ranking Israeli officers have shared similar estimates. Lt. Gen. Dan Halutz, former Chief of Staff of the IDF and Maj. Gen Aharon Zeevi, Chief of the IDF Intelligence Department estimated that March 2006 was the "point of no return" (Inbar 2006). In contrast, U.S. intelligence estimates have projected that Iran is about a decade away from manufacturing key ingredients for a nuclear weapon. According to the revised 2005 U.S. National Intelligence Estimate (NIE), which represents a consensus among U.S. intelligence agencies, there are credible indicators that Iran's military is mastering

technologies through its energy program that could be diverted to bomb-making within the next ten years (Washington Post 2005).

A recent IAEA report released in August 2007, indicates that twelve 164-machine cascades centrifuges were operating simultaneously (about 1968 operational centrifuges), fed with Uranium Hexafluoride (UF6). According to the report, Iran has stated that it has reached enrichment levels up to 4.8% U-235, while IAEA sample confirmed 3.7% (IAEA 2007). In September 2007, Iran has announced that it has now 3,000 centrifuges enriching uranium, completing the fuel cycle. While the claim could not be independently verified by the IAEA, the agency noted that the 3,000 centrifuges would represent a point of no-return for an industrial production of enriched uranium (BBC 2007).

Assessing Israel's Policy Options

Preventive Use of Force

Does Israel have no choice but to face the reality of a nuclear-capable Iran? If Israel indeed loses its nuclear monopoly in the Middle East, what policy choices do Israeli policy-makers have? Will Israel attempt to use force to prevent such a scenario? How would Iran retaliate? Israeli policymakers are determined to prevent Iran or any other neighbouring state acquiring nuclear weapons. In December 2005, Ariel Sharon warned that "Israel - and not only Israel - cannot accept a nuclear Iran; we have the ability to deal with this and we're making all the necessary preparations to be ready for such a situation." (World Net Daily 2005). Such statements may not be a mere rhetoric. On 6 September 2007, Israel conducted a highly-classified air attack on Syria on what Israeli and US intelligence analysts judged as a partly constructed Syrian nuclear facility, apparently modelled on North Korea's design (New York Times 2007). While intelligence estimates pointed that the Syrian facility was years from completion, the timing of the attack may imply that Israel is determined to neutralize even a nascent nuclear project in a neighbouring state. More importantly, it may send a signal to Iran and its nuclear aspirations. While the details of the raid remain wrapped in secrecy, according to a senior Israeli official, the strike was intended to "re-establish the credibility of our deterrent power" (New York Times 2007).

However, a potential Israeli preventive air strike on selected key Iranian nuclear installations would embrace much greater difficulties. In particular, Iran has spread out its nuclear facilities and constructed the bulk of their nuclear complex underground to protect it from conventional air strikes. The difficulty would be further amplified by: (1) the distance that Israeli jets would have to fly over to reach their targets (1000 km) – while the latest Israeli multi-role fighters F-15I are certainly capable of flying the distance, the challenge would be flying either over Arab or Turkish airspace; (2) the potential collateral damage stemming from possible nuclear radiation and contamination of the targeted area; (3) the effectiveness of the upgraded Iranian air defences in countering Israeli fighters (i.e. Russian-made Tor-M1 air defence systems coupled with Iranian upgraded Mig and Sukhoi fighter jets); and (4) the cost of Iranian retaliation. In this context, Iran could respond by interfering with the flow of oil from the Persian Gulf, launching counter-

attacks with conventional ballistic missiles against Israel as well as US bases in the region, and igniting its network of terrorist organizations such Hezbollah and attacking Israel (Inbar 2006).

Would the use of force prove a necessary instrument for Israel, sufficient to coerce Iranian leaders? Much of that depends on the effectiveness and outcome of the existing "carrots and sticks"- economic sanctions as well as incentives offered by the international community to Tehran. Iran has so far showed defiance in freezing its uranium enrichment program and signing the Additional Protocol to the safeguards agreement with the IAEA in exchange for economic benefits offered by the EU3 (France, Germany, and the United Kingdom). The lackluster diplomatic progress, embarked in October 2003, made some analysts question whether Iran is "playing for time" while the international community is "playing with time" (Landau 2007). Yet, the key problem may lie in the lack of consensus within the international community in dealing with Iran – Russia and China oppose any moves toward sanctions and certainly any use of force vis-à-vis Iran.

Reviewing Israel's Nuclear Doctrine

If Iran, or any other neighbouring state in the Middle East, does indeed develop nuclear weapons capability, and openly declares its status confirmed by an overt nuclear test, then Israel will no longer be able to sustain its ambiguous policy and would have to rethink its policy of "bomb in the basement". In the words of Netanyahu, "If an Arab or Muslim country acquires and wields nuclear weapons, this will force a re-alignment in the entire Middle East, in the world in fact. And certainly Israel will have to consider its long held policies as well" (BBC 2006).

Depending on the complexity and modalities of the Iranian "nuclear introduction", Israeli policy makers will have to move beyond the simple dichotomy of the "bomb in the basement" versus the "bomb on the table" debate. In particular, Israel will have to decide when, how, and how much to disclose in order to maximize its nuclear deterrent. According to Beres (1996, 133):

> These are not simple questions. Quite the contrary, they are questions of enormous complexity. Acknowledging this complexity, and building its strategic theory accordingly, Israel must learn to use the orthodox in unorthodox ways, acting not merely to disclose, but to reveal purposefully, subtly, and with long-term nuclear advantage.

Theoretically, in the process of configuring the modalities of the use of Israel's nuclear arsenal, Israeli policy makers will have to consider at least four options in reviewing its nuclear doctrine:

Israel maintains a status-quo by keeping its nuclear opacity intact

Israel may opt for a flexible response by keeping the foundations of its nuclear ambiguity intact. Thus, if Israel's nuclear capabilities, protective efforts, and its nuclear doctrine may remain undisclosed, but not denied either – Israel would continue to signal that is willing and able to deliver an appropriate destructive response. However, as Beres has argued, such a posture may lower the enemy state perceptions of Israel's nuclear deterrent, and increase

the risks for a pre-emptive nuclear strike. Specifically, "with the bomb kept silently in the basement, Israel's imperative communications could be compromised perilously. Unable to know for certain whether Israel's retaliatory/counter-retaliatory abilities were aptly formidable, enemy states could conclude, rightly or wrongly, that a first-strike attack or post-pre-emption reprisal would be cost effective" (Beres 1996).

> *Israel accepts nuclear parity, shifts to a declaratory status based on Mutually Assured Destruction (MAD). Israel declares a "ready arsenal" (launch-on warning); a second-strike nuclear capability; and devises a nuclear war-fighting doctrine*

Israel may switch to an open nuclear posture, yet, with multiple options of disclosure to maximize gains for Israeli nuclear requirements (Beres 1996). It can opt for nuclear deterrence based on nuclear parity and MAD or it may stipulate a war-fighting doctrine, either counter-force or counter-value, by envisioning how a nuclear war would actually be fought in case deterrence fails. Here, Israel would have to determine how enemy states such as Iran would be more likely deterred, and how to amplify the credibility and perceptions of its own ability to retaliate. Appropriate strategy would have to be complemented by the configuration of its nuclear posture. For example, Israel may switch to a "ready arsenal" – launch on warning mode, targeting enemy's population and industrial centres (counter-value). But the modalities, risks, costs, and benefits of a particular strategy would have to be carefully weighted, in order to maximize Israel's nuclear advantage.

> *Israel shifts to a policy of a minimum credible deterrence in the form of a "recessed deterrence" – no first use/second strike capability*

Israel can opt for a policy of minimum credible deterrence – in case Iran or any other Arab state in the Middle East does not overtly test a nuclear weapon nor openly discloses its nuclear arsenal. Following the Indian model, Israel's nuclear doctrine would then underline a policy of no first use, however, its nuclear configuration would have to guarantee sufficient capability for a second-strike that would cause unacceptable damage to the enemy. Given Israel's geostrategic constraints, however, this option would invite an increasing risk for the enemy's pre-emptive first strike on Israel, assuming that Israel cannot trade space for time, or afford to lose a single city. Also, the survivability of Israel's assets to a potential strike would have to be guaranteed. Therefore, this option seems unlikely to maximize maximise Israel's nuclear advantage.

> *Israel resorts to international arms control regime or pursues denuclearization of the Middle East*

Fourth, Israel may rethink the possibility of negotiating regional arms-control talks, and support a WMD-free Middle East. According to Joseph Cirincione, Director for Non-proliferation at the Carnegie Endowment for International Peace, "Bringing them [Israeli nukes] out into the open and putting them on the table as part of a regional deal may be the only way to prevent others from building their own bombs in their basements" (CFR 2007). In the Israeli perspective, however, this option seems unlikely. In order to consider

disarmament, there would have to be a "comprehensive peace" with Arab countries as well as Iran. Furthermore, Iran would have to renounce its nuclear programs in conjunction with the dismantlement of Egypt, Syria and Saudi Arabia's chemical and biological weapons programs.

Israel's Nuclear Assets

Notwithstanding the fact that Israel has never officially admitted the possession of nuclear weapons, based on the 1988 testimony by Mordechai Vanunu (a renegade Israeli nuclear technician working at the highly-classified Dimona nuclear facility), Israel does have nuclear arsenal amplified by the capability to produce nuclear weapons at the rate of three or four a year. According to Jane's Intelligence, Israel's nuclear arsenal includes at least 200 tactical nuclear weapons – boosted fission weapons and neutron bombs, with a combined total yield of 50 MT, including aerial bombs, artillery shells and mines, along with delivery systems such as the Jericho-2 intermediate-range ballistic missile (Blanche 1999).

To maximize its nuclear advantage in preparing for "the day after", Israel will have to reconfigure its nuclear assets to a strategic triad – develop the capability to launch nuclear warheads from air, land and sea. At the same time, it would have to minimize the vulnerability of its arsenal, enhance its early-warning, intelligence, and command and control capabilities. Simultaneously, it would have to enhance its missile defence capability (i.e. anti-ballistic missile program Arrow 2).

In particular, Israel currently deploys the majority of its missiles - at least 50 Jericho 2 nuclear-tipped missiles - at the Zachariah (which in Hebrew means "God remembers with vengeance") air force base near Tel Aviv. The Jericho 2 missile is believed to be a 14 m long and 1.5 m wide, with two solid-propellant stages, and range up to 3,500 km with a warhead of 1000 kg, which is sufficient for 1 MT yield nuclear warhead (Hough 1997). Based on 2002 Ikonos satellite-imagery (Global Security 2002), the Jericho 2 missiles are not stored in hardened silos, but in limestone caves and nearby nuclear bunkers underneath the site. In short, the Zachariah missile base is obsolete and vulnerable to a nuclear first strike, which could be potentially destroyed by a 20 kt nuclear warhead. Furthermore, Israel's anti-missile defences are based on land and hence more vulnerable to aerial detection and tracking (Hough 1997).

Thus many prominent Israeli strategists argue that Israel's strategic deterrent should be moved to the sea (Creveld 2004). This would create artificial strategic depth that Israel needs, and at the same time provide Israeli policy makers an option for a second strike capability. To this end, Israel has already acquired three state-of-the-art German-made Dolphin-class submarines (worth $320 million each), which are believed to be armed with nuclear-tipped Popeye Turbo cruise missiles, aimed at deterring a potential aggressor from initiating a surprise first-strike attack on Israel. Israel has not confirmed the presence of the nuclear-armed cruise missiles; however, it refers to the Dolphin submarines as "national deterrence assets" (Parsi 2006). Currently, under a system of rotation, two of the submarines remain at sea – one in the

Red Sea and Persian Gulf, the second in the Mediterranean – the third remains on standby (Israeli Weapons 2007).

Finally, any change in Israel's nuclear strategy will likely increase the demand for both plutonium and tritium produced at the Israeli nuclear research facility at Dimona in the Negev Desert. Tritium is used to significantly enhance the yield of a nuclear weapon, either through boosting or fission, or through thermonuclear fusion. However, tritium decays rapidly (its half-life is only 12.3 years) and is difficult to obtain. In the Israeli context, Israel needs Dimona to replace the tritium in its nuclear weapons. Specifically, assuming that Israel has 200 weapons with an average of 4g of tritium in each one and 40 neutron bombs with an additional 20g each, the total Israeli inventory is at least 1.6 kg of tritium. This means that Dimona must replace at least 88g of tritium each year. Without Dimona, Israel will need at least a 30-40 MW nuclear reactor to keep the current arsenal (Hough 1998). However, after 44 years of operation, Dimona is suffering from a neutron radiation from the reactor core, which has changed the reactor structure at the atomic level, thereby increasing the risks for a nuclear accident.

Conclusion

The spectre of the nuclear proliferation in the Middle East is pushing Israel's nuclear opacity on the table. The key question is whether Israel will be able to maintain a nuclear monopoly and prevent nuclear proliferation in the volatile region. The prospect of nuclear weapons in the hands of an erratic and vindictive Iranian regime threatening Israel's existence is not an acceptable option for Israel's policy makers. Based on Israeli threat perceptions and historical experience, Israel may have no choice, as a measure of last resort, but to attempt once again to deny its enemy the capability to develop nuclear weapons. As Ehud Barak noted (BBC 2006), the prevailing lesson from Israel's war experience has been the belief that "ultimately we [Israel] are standing alone." This belief may essentially continue to drive Israel's strategic choices.

At the same time, Israel will have to reassess its nuclear strategy, and modify its policies beyond nuclear opacity. Its strategic choices will impact the development and deployment of its nuclear weapons. In doing so, Israel will have to address a number of complexities pertaining to the question how to maximize its nuclear deterrent, particularly in the eyes of its adversaries. This also means enhancing survivability of Israel's nuclear assets. Ultimately, however, Israel will have to increasingly conceptualize the possibility of openly integrating its nuclear doctrine into its defense strategy. Unless the Pandora's Box of nuclear proliferation in the Middle East remains closed.

References

Albright, David. 2006. When Could Iran Get the Bomb? *Bulletin of the Atomic Scientists*. 62(4): 26-33.

Barnaby, Frank. 1996. Capping Israel's Nuclear Volcano, in *Between War and Peace: Dilemmas for Israeli Security*, edited by Efraim Karsh, 106. Portland: Frank Cass, 1996.

BBC. 5 October 2006. Will Israel Bomb Iran? http://news.bbc.co.uk/2/hi/programmes/this_world/5377996.stm

____. 2 September 2007. Iran 'reaches key nuclear goal' http://news.bbc.co.uk/2/hi/middle_east/6974903.stm

Ben-David, Alon. 2004. Double Jeopardy. *Jane's Defence Weekly*. 17 November 2004: 19-28.

Beres, Louis Rene. 1996. Israel's Bomb in the Basement: A Revisiting of Deliberate Ambiguity vs. Disclosure. *in Between War and Peace: Dilemmas for Israeli Security*, edited by Efraim Karsh, 113-136. Portland: Frank Cass, 1996.

Blanche, Ed. 1999. Israel Addresses the Threats of the New Millennium. *Jane's Intelligence Review*. February 1999: 25.

Cohen, Avner. 1999. *Israel and the Bomb*. New York: Columbia University Press.

Cohen, Stuart. 1992. Changing Emphases in Israel's Military Commitment, 1981-1991: Causes and Consequences. *Journal of Strategic Studies* 15(3): 330-350.

Council on Foreign Relations. February 2006. *Israel's Nuclear Program and Middle East Peace.* http://www.cfr.org/publication/9822/israels_nuclear_program_and_middle_east_peace.html#6

Creveld, Martin. 2004. *Defending Israel: A Controversial Plan toward Peace*. New York: St. Martin's Press.

Global Security. 2002. *Beit Zachariah: New Analysis* http://www.globalsecurity.org/wmd/world/israel/sedot_mikha.htm Accessed: 26 Sept. 2007)

Hough, Harold. 1997. Could Israel's Nuclear Assets Survive a First Strike? *Jane's Intelligence Review*. September 1997: 407.

_____1998. Israel Reviews its Nuclear Deterrent. *Jane's Intelligence Review*. November 1998: 12.

IAEA. 30 August 2007. *Implementation of the NPT Safeguards Agreement in the Islamic Republic of Iran* http://www.iaea.org/Publications/Documents/Board/2007/gov2007-48.pdf

Inbar, Efraim. 2002. Israel's Strategic Environment in the 1990s. *Journal of Strategic Studies* 25(1): 21-38.

_____. 2005. The Imperative to Use Force against Iranian Nuclearization. *BESA Perspective Papers on Current Affairs* http://www.biu.ac.il/Besa/perspectives12.html

_____. 2006. The Need to Block a Nuclear Iran. *Middle East Review of International Affairs*. 10(1) http://meria.idc.ac.il/journal/2006/issue1/jv10no1a7.html

Israeli Weapons. *SSK Dolphin Class Attack Submarine.* http://www.israeli-weapons.com/weapons/naval/dolphin/Dolphin.html (Accessed: 26 Sept. 2007)

Karpin, Michael. 2006. *The Bomb in the Basement*. New York: Simon & Schuster.

Landau, Emily. 2007. Iran's Nuclear Advances: The Politics of Playing with Time. *Strategic Assessment*. 10(1) http://www.tau.ac.il/jcss/sa/10_1_03.html

Mitnick, Joshua. 2006. Why Israel Maintains Nuclear Ambiguity. *Christian Science Monitor*. http://www.csmonitor.com/2006/1214/p07s02-wome.html

New York Times. 15 April 2007. With Eye on Iran, Rivals Also Want Nuclear Power. http://www.nytimes.com/2007/04/15/world/middleeast/15sunnis.html

_____. 15 October 2007. Israeli Target in Syria was Nuclear Site, Analysts Say.

Parsi, Trita. 2006. Is Nuclear Parity with Iran a Blessing in Disguise for Israel? *Jane's Intelligence Review*. January 2006: 34.

Rosen, Steven. 1977. A Stable System of Mutual Nuclear Deterrence in the Arab-Israeli Conflict. *The American Political Science Review*. 71(4): 1367-2383.

State of Israel. Ministry of Foreign Affairs Press Statement. 9 June 1981. Press Conference with Prime Minister Begin, I.D.F. Chief of Staff Eitan, I.A.F. Commander Ivri and Director of Military Intelligence Saguy. http://www.mfa.gov.il/MFA/Foreign+Relations/Israels+Foreign+Relations+since+1947/1981-1982/

Washington Post. 2 August 2005. Iran is Judged 10 Years From Nuclear Bomb. http://www.washingtonpost.com/wpdyn/content/article/2005/08/01/AR2005080101453.html

World Net Daily. 11 December 2005. Israel Plans Strike on Nuclear Iran. http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=47848