In the case of Israel, far more is known about its approach to modernisation in the most general terms and in the military context than about its approach to nuclear weapons. Whatever factual information is publicly available relies on sources outside of Israel. The analysis below will first explore relevant foreign sources in an effort to summarise the factual information available regarding Israel’s nuclear weapons programme and plans for its modernisation. It will then draw on relevant domestic sources in order to provide a broader context for these issues.

According to foreign sources

Since 1970, when the New York Times published revelations based on US intelligence assumptions, it has been widely assumed that Israel possesses nuclear weapons. Because Israel has never officially confirmed or denied having nuclear weapons, the scope and nature of its nuclear arsenal is based on the assessments of foreign sources, which vary widely. Based on available foreign information, the current status and modernisation plans of Israel’s nuclear programme are outlined below.

Nuclear weapons

Estimates about the size of the arsenal are based on the power capacity of the nuclear reactor near Dimona (which, like the overall program, is subject to secrecy and uncertainty) ranging from 24MWt to 70MWt or more and on assumptions about production that in turn are based on speculation, scientific calculations, and unconfirmed revelations dating back to 1986.

Experts and analysts outside of Israel estimate that Israel’s current nuclear force ranges from 60–80 weapons at the low end to over 400 at the high end. The most recently cited figure is 80 warheads.

Fissile materials

It is estimated that, Israel could have produced approximately 840 kg of weapons-grade plutonium. Estimates of highly enriched uranium (HEU) production are even more difficult to make, though public information suggests Israel has a uranium enrichment programme. A recent estimate has assumed Israel possesses approximately 300 kg of HEU.

Delivery systems

The Sdot Micha Air Force Base is believed to host nuclear-tipped missiles. It is also assumed that Israel has a triad of delivery systems: land, air, and sea. Specifically, Israel is believed to have deployed a cumulative total of 100 Jericho-I (500 km range) and Jericho-II (1,500 km range) ballistic missiles, both of which are nuclear capable as well as mobile by land or rail. The range of the Jericho-II and its 1,000 kg payload “make it well suited for nuclear delivery.” Israel’s space-launch rocket, the Shavit, which is similar to the Jericho-II, could “also be conceivably modified to deliver a nuclear weapon, thus granting Israel the ability to deploy an intercontinental ballistic missile if there were ever a political desire to do so,” although there is no indication of such a desire at this time. In terms of modernisation, Israel is currently developing a new ballistic missile, the Jericho-III, which is believed to have a maximum range of 4,000–6,500km.

Israel’s aircraft capabilities give it the option of using its F-16 Falcons or F-15 Eagles to deliver nuclear weapons. Both have a range of 2,500 km. As of late 2008, Israel was believed to have well over 200 Falcons, which it had purchased from the United States, although it is assumed that only a fraction of this number will have the modifications, trained crews, and practiced procedures necessary to make them suitable for the nuclear mission.” Israel’s 87 Eagle fighter and ground attack aircraft were more recently purchased from the US, which itself designated the F-15E Strike Eagle for delivery of nuclear weapons, an indication that Israel could do the same.

Israel’s sea-launched nuclear capability is based on three Dolphin-class submarines that were bought from Germany, all of which were received and deployed by the year 2000. These submarines are believed to be armed with dual-capable cruise missiles that were developed in Israel, with each missile having an estimated range of 1,500 km. Reports claiming that these submarines are armed with modified US Harpoon anti-ship missiles (some of which could have been modified to deliver nuclear weapons to land targets) have been denied, but “In 2003, in an interview with the Los Angeles Times, Israeli and American officials announced that Israel had deployed U.S. supplied Harpoon ASCMs on its Dolphin submarines and modified the missiles to carry nuclear warheads.” In September 2014, Israel received the fourth of six German-made submarines. Theses submarines are reportedly nuclear capable.

Infrastructure

The Israel Atomic Energy Commission (IAEC), among the most secretive organisations in Israel, is the government agency that oversees the country’s nuclear activities.
All factual information about its operations, including budget, organisational structure, relations with other military and defence organizations, and parliamentary oversight, is classified. The IAEC is chaired directly by the prime minister and operates “to a certain extent under a dual identity,” serving both as the government agency that executes national nuclear policy and as a body staffed by nuclear scientists that carries out Israel’s nuclear research. The IAEC also represents Israel in international nuclear fora.

The IAEC oversees the operation of Israel’s two national nuclear-research facilities. The Negev Nuclear Research Center, located near the southern desert town of Dimona, “includes working units for a full array of nuclear-weapons-related activities, from uranium conversion, fuel fabrication and uranium enrichment, to a plutonium-production reactor and reprocessing mechanisms, and possibly weapons-specific facilities” and is reportedly believed to serve as “Israel’s national laboratory in the nuclear field.” As noted above, estimates vary regarding the reactor’s capacity. The original capacity of 24MWe was reportedly expanded to 40MWe and later to 70MWe.

The Soreq Nuclear Research Center, located approximately 40km south of Tel Aviv, was purchased from the US as part of the “Atoms for Peace” programme. It was originally constructed as a 1MWe light-water research reactor and later expanded to 5MWe. It is the only facility in Israel under IAEA safeguards. According to the Soreq website:

Its R&D activities include laser and electro optics, nuclear medicine, radiopharmaceuticals, non-destructive testing, space components characterization and testing, crystal growth, development of innovative radiation detectors and sophisticated equipment for contraband detection. It offers radiation protection training, and operates personal dosimetry service. It is a major distributor of radiopharmaceuticals for medical diagnostics and therapy.

In sum, Israel is assumed to have “full fuel-cycle capabilities” but specific details and current information is not available. It is also assumed that other nuclear activities related to weaponisation are “carried out in other secret facilities.” It is further believed that “Israel is upgrading its deterrence capabilities.”

Policy

The secrecy surrounding Israel’s nuclear activities serves the policy of nuclear “ambiguity” or “opacity.” Nuclear opacity has been defined as a situation in which “a state’s nuclear capability has not been acknowledged, but is recognized in a way that influences other nations’ perceptions and actions.” In Israel’s case, this policy was the product of a compromise with the United States that emerged during the years leading up to conclusion of the nuclear Non-Proliferation Treaty (NPT), the period during which Israel was reportedly developing its first nuclear weapons. The NPT was opened for signature in 1968 and entered into force in 1970.

Israel had reportedly completed its first nuclear device by May 1967. Despite US pressure, in 1968 Israel informed the US that because of its security needs, it could not sign the NPT at that time. A nuclear option was seen as an existential necessity. In 1969 Israeli Prime Minister Golda Meir and US President Richard Nixon reached a secret agreement that laid the foundation for a tacit “don’t ask, don’t tell” policy between the two states with respect to Israel’s nuclear-weapons capability. The US accepted that Israel felt a security-based need to have a nuclear-weapons capability, and Israel agreed not to undermine the NPT by openly declaring its nuclear capability. The secrecy surrounding Israel’s nuclear programme is an outgrowth of this compromise.

According to domestic sources

The policy of opacity has shaped and circumscribed Israel’s non-proliferation, arms control, and disarmament policies. Despite this opacity, however, Israel does participate publicly in some non-proliferation activities and agreements. In fact, Israel is generally supportive of the non-proliferation regime, and particularly in recent years, has made efforts to be recognized as a technologically advanced, mature state committed to the “spirit of the NPT”.

Interest in participating in international nuclear activities (including an India-like exception to Nuclear Supplier Group guidelines) and a recurring but fledgling interest in exploring nuclear energy options have informed this new approach. Similarly, domestic discourse, though far from democratically free and open, exists but is also circumscribed by the policy of opacity.

International law and doctrine

Israel has signed but not yet ratified the Comprehensive nuclear Test Ban Treaty (CTBT), citing concern with the as-yet incomplete development of the verification regime and potential abuse of this regime; Israel’s status in the policy making organs of the Treaty; and concerns with the regional security situation in the Middle East. It actively participates in verification activities of the CTBT Organization Preparatory Committee. Israel is a signatory or party to a number of non-proliferation-related (safety and security) agreements, including the Vienna Convention on Civil Liability for Nuclear Damage, the Convention on the Physical Protection of Nuclear Material, the Convention on Early Notification of a Nuclear Accident, the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, Convention on Nuclear Safety, the Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the IAEA, and a Safeguards Agreement applicable to the Soreq nuclear facility.
On the basis of the above legal commitments, in combination with its NPT non-party status and its emphasis on security and secrecy surrounding nuclear activities, Israel projects itself both domestically and internationally as a responsible non-proliferant (in the sense of not supplying nuclear technology to others but, rather, having an interest in sharing safety and security expertise). Not having signed the NPT, Israel is not bound by its article VI disarmament obligations under a strict treaty-based interpretation of international law, which is the prevalent view in this context. Arguments based on customary international law that posit a universal obligation to disarm have not gained ground or drawn attention (or a rebuttal) within Israel, but they would likely be countered by the argument that Israel is not bound by agreements that it has not signed (a view consistent with Israel’s general approach to international legal norms and obligations) and has, in fact, systematically rejected. The “persistent objector” exception to a customary international legal norm would likely be invoked in the event that customary international law is given consideration. In this context, any modernisation of nuclear weapons would not be perceived by Israel as a conflict with international legal commitments.

Public discourse
The domestic discourse on nuclear issues is characterized by what has been termed the “enigma of opacity”: ignorance is a qualification for speaking on nuclear issues. Anyone who “knows” cannot speak openly about the issues, while anyone who speaks must first profess ignorance by asserting reliance on foreign sources.

At the basis of nuclear policy is the question of legitimacy (Israel’s right to exist). Perceived existential threats informed, drove, and shaped the development of a nuclear programme. US-led non-proliferation efforts shaped the further development of this secrecy. Yet the concept of nuclear “deterrence” requires that others (the target audience) be aware of Israel’s capability. Thus it relies on foreign sources and indirect references because a strictly secret nuclear programme would have no deterrent value. This interaction between secrecy and opacity is further shaped by questions of Israel’s legitimacy or right to exist. On the one hand, Israel still perceives nuclear deterrence as a guarantor of its existence, that is, opacity as an existential issue. On the other hand, international criticism of Israeli nuclear policy, which is unique in the global arena, feeds into and reinforces challenges to Israel’s legitimacy. The trilateral interplay among these issues – opacity, secrecy, and legitimacy – is represented in the figure below.

One presumably unintended consequence of the internalised secrecy within Israeli society is that the phrase “according to foreign sources” has come to imply sensitive and secret information about internal domestic issues. It is ironic and perhaps unique among nations that the term “foreign sources” in Israel refers to “our own innermost secrets”.

The policy of opacity entails a nuclear weapons capability about which “everyone knows” (domestically and internationally, with the former reliant on the latter) and an umbrella of secrecy covering the physical and doctrinal elements of this capability. The nuclear-capable aspect of opacity, which is perceived as provocative or in violation of international law by Israel’s critics, is projected within Israel as a policy of restraint, of which secrecy is an element: Israel does not advertise its nuclear capability; Israelis do not conduct parades celebrating their nuclear capabilities (unlike other countries); secrecy is the alternative to open declaration of a nuclear option, which would be provocative. This is the prevalent perception.

The secrecy surrounding Israel’s nuclear programme, which has its origins in the US-Israel compromise discussed above, has taken on a life of its own at the domestic level. The origins of opacity are no longer the driving force as Israelis practice self-censorship on a wide range of nuclear
issues. At the same time, a discourse does exist at the academic level and, increasingly, in the media, driven in large part by debate over Iran’s nuclear programme and the best response. This discourse relies on foreign sources as a factual foundation, but that has not prevented a relatively open discourse at the elite level within the contours of academic and think-tank dialogue. For example, the Institute for National Security Studies (Israel’s foremost security think tank) addresses “the Obama vision” of nuclear disarmament from an Israeli perspective (generally regarding this vision as unrealistic). It has frequently been asserted that Israel views its nuclear programme as a “sacred national insurance policy” and even critics of the policy in its current form have asserted that “for a state born out of the Holocaust and surrounded by the hostile Arab world, not to [acquire a nuclear weapons capability] would have been irresponsible.”

A somewhat superficial but nevertheless telling example illustrates the difference between Israel’s domestic and international discourses as well as the potential for change within Israeli policy. Following the 2011 and first-ever IAEA forum on a nuclear weapons free zone (NWFZ) in the Middle East, which Israel had resisted for 11 years, an editorial was published in the newspaper Ha’aretz observing that, in the words of a participating Israeli delegate “the sky didn’t fall on us.” The secrecy born of the policy of opacity had bred a fear of discussing the issues that turned out to be unfounded. What is most telling about this editorial, however, is that despite a faithful translation between the Hebrew and English versions, the headlines differed.

In English the editorial was entitled “Israel is clinging dearly to its policy of nuclear ambiguity” and the subheading went on to state, “Israel has never claimed that there is no possibility it will change its nuclear policy one day. But for Israel that’s a vision for the distant future.” The Hebrew version was identical except for the headline, which directly translates as “Disarmament, But Not Now.” Ha’aretz is a daily newspaper published in both Hebrew and English, and not surprisingly, the emphasis in coverage differs slightly: a foreign-language target audience is not likely to seek an Israeli newspaper for coverage of news that has no direct bearing on Israel, whereas Hebrew-language readers are more likely to rely on Ha’aretz if it is their newspaper of choice for coverage of any news, domestic or foreign. What is telling in the case of the editorial mentioned above is the difference in emphasis when the same editorial is packaged for foreign vs. domestic consumption. In the former case the emphasis is on maintenance of the old nuclear policy, and the words “clinging dearly” imply a near-desperate tone (not actually reflected in the body of the editorial). In the latter case the emphasis is on disarmament, a relatively new idea for a domestic audience.

**Weapon of mass destruction free zone**

The goal of a nuclear weapon free zone (NWFZ) or weapons of mass destruction free zone (WMDFZ) in the Middle East is not a new idea among Israeli’s diplomatic representatives, however. Israel has joined the consensus UN General Assembly resolution on a Middle East NWFZ since 1980, but with reservations. As stated in Israel’s most recent explanation of vote on this resolution:

A credible [regional security] process is also closely connected to the widely agreed principle that the establishment of any NWFZ, or WMDFZ as is in the case of the Middle East, must be based on arrangements freely arrived at. This requires that regional states have to fully commit themselves to open and direct communication channels, to genuine engagement and the acknowledgement of the threats and challenges facing other regional partners. They have to recognize all regional states’ right to exist and the need to build a spirit of conciliation rather than of confrontation. In the final analysis, this is an incremental process, where one building block must be placed on top of the other, in a stable and sustainable manner.

During the UN General Assembly meetings Israel annually asserts that “it remains committed to a vision of the Middle East developing eventually into a zone free of Chemical, Biological, and Nuclear weapons as well as ballistic missiles” but that these issues can only be “realistically addressed within the regional context.” A NWFZ, or a WMDFZ (which, as Israel notes, is unprecedented) “must be based on arrangements freely arrived at through direct negotiations between the states of the region and those directly concerned, applying a step by step approach.”

On 23 November 2012, the United States announced the indefinite postponement of the conference to establish a Middle East WMDFZ, a decision that has been criticized by the Arab states of the region and co-convener of the conference, the Russian Federation. Subsequently, the Finnish facilitator, Ambassador Jakoo Laajava, has convened five multilateral consultations in preparation for such a conference, in which Israel has participated on senior or authoritative level. As of 1 April 2015 no further meetings have been held, nor has a date for the conference been announced.