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Comparing Israel's and Iran's Nuclear Programs

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Despite being a signatory to the Nuclear Non-Proliferation Treaty (NPT), since its 1979 revolution and especially over the past 10 years, Iran has come under unprecedented scrutiny by the International Atomic Energy Agency (IAEA) and the United Nations Security Council over its nuclear program. Meanwhile, Israel—one of only four NPT non-signatories (Pakistan, India and North Korea are the others) and the only state in the Middle East actually possessing nuclear weapons—has remained free from any meaningful international oversight. While Iran has suffered debilitating economic sanctions over unproven suspicions that it might have a clandestine nuclear weapons program, Israel, with an arsenal of hundreds of modern nuclear weapons and a sophisticated delivery system capable of targeting the entire Middle East and Europe, is permitted to act with impunity.

Not only has this blatant double standard over the Iranian and Israeli nuclear programs been recognized by many observers as weakening the international nuclear non-proliferation agenda, but it raises the specter of a nuclear arms race in the Middle East. Shortly before stepping down as IAEA director general in November 2009, Mohammed Elbaradei declared, "This is not really sustainable that you have Israel sitting with nuclear weapons capability there while everyone else is part of the non-proliferation regime." As Joseph Cirincione, former director for nonproliferation at the Carnegie Endowment for International Peace, points out, "The world does well to remember that most Middle East weapons programs began as a response to Israel's

nuclear weapons…It should be obvious that Israelis are better off in a region where no one has nuclear weapons than in one where many nations have them."

The Shah's Nuclear Program

Iran's nuclear program had its beginnings in the 1953 CIA-orchestrated coup that deposed Prime Minister Mohammad Mosadegh and installed Mohammed Reza Pahlavi to power. That same year President Dwight Eisenhower gave his "Atoms for Peace" speech promoting the civilians uses of nuclear technology, including the promotion of nuclear power. Under the aegis of a civilian nuclear cooperation program established under the Atoms for Peace program, Iran sent students abroad to study nuclear engineering in the United States and in 1967 established the Tehran Nuclear Research Center (TNRC) run by the Atomic Energy Organization of Iran (AEOI). The TNRC's centerpiece was a U.S.-supplied 5-megawatt reactor fueled with Highly Enriched Uranium (HEU). The following year, Iran signed the NPT, making its nuclear program subject to IAEA verification inspections.

In the early 1970s, Tehran approved plans for 20 commercial power reactors, with the shah stating in 1974, "Petroleum is a noble material, much too valuable to burn…We envision producing, as soon as possible, 23,000 megawatts of electricity using nuclear plants."

With its substantial oil revenue, Iran proceeded to order its first two nuclear power reactors at Bushear from Germany in 1975. It also signed a contract with France to construct two more reactors at Darkhovin. To supply the reactors with fuel, Iran invested in a uranium enrichment factory in France, with the shah lending the Eurodif consortium (including France, Sweden, Belgium and Spain) more than $1 billion for the right to purchase 10 percent of the production of enriched uranium. In 1976, the U.S. offered Iran a reprocessing facility for extracting plutonium from used reactor fuel. "Introduction of nuclear power will provide for the growing needs of Iran's economy," Washington stated, "and free remaining oil reserves for export or conversion to petrochemicals." This argument supporting nuclear power continues to be the basis of Iran's current nuclear power rationale.

In addition, Iran signed an agreement with the apartheid regime in South Africa whereby Iran helped finance the development of nuclear fuel technology in return for guaranteed supplies of enriched uranium.

By the late 1970s, concerns about nuclear proliferation and a potential Iranian nuclear weapons program resulted in erosion of U.S. support for Iran's nuclear ambitions. American pressure on France and Germany led to cancellation of the Bushear and Darkhovin reactors. France refused to deliver the enriched uranium purchased under the Eurodif partnership. The plutonium-reprocessing offer was withdrawn. By the time of the 1979 Islamic Revolution, the Iranian nuclear program was in disarray.

Iran's Nuclear Program Since 1979

For the first few years after the revolution, Iran's nuclear program was at a standstill due to the confluence of several influences: withdrawal of Western support; the mass exodus of Iranian nuclear scientists; the opposition to nuclear technology of Ayatollah Ruhollah Khomeini; and Israel's destruction of Iraq's nuclear facility at Osiraq. This began to change in the late 1980s, especially after Khomeini's death in 1989. In 1995, Iran signed a contract with Russia to complete the two Bushear reactors, which had been damaged during the Iran-Iraq war. The first reactor is now scheduled to go online sometime this year. Officials also announced resumption of work on the Darkhovin project, with plans for an operational 360 megawatt reactor by 2016. To fuel these reactors, Iran has initiated an ambitious integrated program of uranium mines, uranium processing and enrichment facilities, a heavy water production facility, and research reactors.

As it is legally entitled to do under provisions of the NPT, Tehran has proceeded with a uranium conversion and enrichment program. Primarily focused on low enriched uranium for the power reactors, Iran has also produced smaller amounts of 20 percent enriched uranium to fuel a reactor for producing medical isotopes.

Despite the fact that Iran allowed unprecedented inspections of its nuclear facilities by the IAEA, which found no evidence that Iran has a nuclear weapons program, the Security Council has imposed several sets of sanctions against Iran. The reason given for these sanctions is Tehran's delay in declaring the existence of several nuclear facilities, and a lack of transparency about former nuclear and missile-related programs. Iran has responded that it has complied with the legal requirements of the NPT and that the sanctions have been politically motivated. As recently as February 2011, the IAEA has continued to state that there is no evidence that Iran is currently pursuing a nuclear weapons program, a finding that conforms to a 2007 U.S. National Intelligence Estimate (NIE).

The History of Israel's Nuclear Program

Israel's nuclear program had its inception with the establishment of the state in 1948. Profoundly influenced by the horrors of the Holocaust, Ernst David Bergmann, "father" of the Israeli bomb program, and David Ben-Gurion began a program to develop nuclear weapons because, in the words of Bergmann, "The State of Israel needs a defense research program of its own, so that we shall never again be as lambs led to the slaughter." In 1952, the Israeli Atomic Energy Commission was established, and the Israeli bomb project initiated.

Like the Iranians, Israel eagerly signed up with Washington's Atoms for Peace Program and, like the Iranians, was rewarded by the U.S. with a 5 megawatt highly enriched uranium research reactor. By the mid-1950s, Israeli nuclear and computer scientists began collaborating with their French counterparts in the French bomb project, and were integral partners with Paris in the Algerian atomic bomb tests. For its part, France reciprocated by building Israel a natural uranium

heavy water moderated plutonium production reactor and reprocessing plant at Dimona. Israel also forged a nuclear partnership with South Africa's apartheid regime, providing it with technical and economic assistance in return for access to uranium and missile launch test facilities

Despite Israel's assurances to Washington that Dimona was a peaceful research facility, extreme security measures—including shooting down one of its own Mirage fighters, and a civilian Libyan airline, killing 104 civilians—told a far different story. Dimona went online in 1964 and plutonium production began shortly thereafter. By 1966 Israel had built its first nuclear weapon, and by the 1967 war two nuclear weapons were ready for use. During the 1973 war, Israel possessed several dozen nuclear weapons and threatened to use them in order to coerce the U.S. into providing a massive airlift of weapons.

By the 1970s, U.S. intelligence agencies had become aware of Israel's nuclear bomb program, but it was generally thought that its arsenal consisted of no more than a relative handful of primitive devices. These estimates were demolished in 1986, when a Dimona nuclear technician, Mordechai Vanunu, smuggled out hundreds of photos published in the Sunday*London Times.* Analysis by senior nuclear weapons designers Frank Barnaby and Ted Taylor showed that Israel possessed approximately 200 highly sophisticated nuclear weapons, including boosted fission and, perhaps, hydrogen bombs. Barnaby concluded, "The acquisition by Israel of lithium deuteride implies that it has become a thermonuclear-weapon power—a manufacturer of hydrogen bombs…Israel has the ability to turn out the weapons with a yield of 200-250 kilotons."

Although Israel maintained—and still maintains—a position of "nuclear ambiguity," neither acknowledging or denying its nuclear arsenal, the Israeli "bomb in the basement" was now an open secret.

Israel's Nuclear Arsenal

Most estimates of Israel's current nuclear arsenal range from about 100 to over 400 weapons, making it comparable in size to the British, French and Chinese arsenals. However, given the sophistication of the weapons and their delivery systems, and the immense power of these weapons, the actual size of the Israeli arsenal is largely moot. Even at the lowest estimates, Israel possesses enough nuclear weapons to destroy every major Middle Eastern city several times over. Like the U.S. and Russia, the Israeli nuclear threat is based on a triad of delivery systems: long-range bombers, ballistic missiles and submarines, with which it can target all of Europe and the Middle East, and much of Asia and Africa.

The Israeli nuclear bomber fleet consists of 25 F-15-E and 102 highly modified F-16-I fighter-bombers with a reported range of nearly 4,500 kilometers—enough to fly from Israel to Iran and back. The Israeli ballistic missile arsenal consists of approximately 100 Jericho-1 and 50 Jericho-2 missiles. The Jericho-1 missile has a range of over 500 kilometers and can reach Damascus or

Cairo. According to the widely respected *Jane's Intelligence Review,* the Jericho-2 has an extended range of approximately 5,000 kilometers carrying a 2,500 kilogram payload. A more powerful missile called Jericho-3 is under development.

The third leg of the triad consists of five Dolphin-Class submarines (three currently deployed and two more scheduled for deployment in 2011 or 2012). These super-sophisticated diesel-powered subs, built for Israel by the Germans, have an extended range of about 8,000 kilometers. The two new subs scheduled for delivery during the coming year have an extended range of 10,000 kilometers.

In 2000, an Israeli submarine successfully launched a cruise missile that destroyed a target more than 900 miles away. Israel currently is stationing its submarines in the Persian Gulf and the Red Sea—targeting Iran.