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An electromagnetic pulse attack — the ‘other’ Iranian nuclear threat

Some experts say Tehran may be preparing for an EMP strike — which could ‘fry’ electrical grids, with devastating consequences

By [DAVID SHAMAH](#) October 14, 2012, 7:31 pm

Just what might happen if the Iranians got their hands on a nuclear weapon? Would they fire it at an Israeli city, causing tens or hundreds of thousands of casualties? Or would they use it as a geopolitical weapon, seeking to dominate the Middle East and forcing the hand of Western powers, either subtly or by overtly threatening death and destruction to those who fail to heed their dictates?

While political scientists and world leaders have debated the likelihood of those two possibilities, there is a third plausible scenario: The use of a nuclear weapon by Iran to carry out an electromagnetic pulse (EMP) attack against Israel, the US, or Europe. Such an attack could cause severe damage to the electrical grid in the targeted nations, to the extent that the routines of daily life — centered around the use of electrical power — could be halted, for a short or even long period of time.

An EMP is an above-atmosphere level detonation of a nuclear device that produces enough radiation to wreak havoc with electrical systems. The blast produces a very brief but intense electromagnetic field that can quickly induce very high currents in electrical devices, shorting them out. The stronger the electromagnetic field — the “pulse” — the stronger the current, and the more likely electrical devices are to “blow out.” It’s akin to a power surge that shorts out your refrigerator or TV when too much voltage surges through the electrical outlet... on a whole other scale.

While there is much speculation as to what exactly an EMP would do to electrical appliances and digital devices — scientists have differences of opinion over how badly they would be affected (the world hasn’t really experienced a direct EMP blast yet, so much of the speculation is based on educated guesses) — the far-greater concern is what an attack would do to the electrical infrastructure in a

targeted area. If an EMP strike is large enough, or there are enough such strikes, the blasts could knock out power plants, electrical substations, and other sensitive equipment, causing a massive power failure that may take weeks or months to overcome. Data centers housing servers would likely be badly damaged as well, as would be communications systems.

The EMP issue is hardly being discussed in Israel, said Dr. [Emily Landau](#), director of the Arms Control and Regional Security Program at Israel's [Institute for National Security Studies](#) and a lecturer at Tel Aviv University. "There isn't much discussion of it right now, but when the discussion does begin, there is no doubt that it will focus on the balance between how much it will cost to deal with, versus how likely such an attack may be," she said.

[Landau](#), an expert on Iran's nuclear program, believes that Iran could very well be planning an EMP attack on Israel, based on statements the Iranian regime has made, and actions it has taken. And, she said, Iran would be capable of delivering an EMP attack if it acquired a nuclear weapon.

"Some are skeptical that Iran would use a nuclear bomb just for an EMP attack," said [Landau](#). "If they already have a nuclear weapon, why not use it for the main purpose for which it was designed? But while a nuclear bomb targeting an Israeli city would cause mass destruction on a local or regional basis, an EMP attack could cause even more lasting damage, destroying Israel's electrical grid."

If Iran did opt for an EMP attack, the damage to Israel would be very high, she said. "Iran doesn't have a nuclear bomb yet, and hopefully they won't have one, but if they do manage to build a bomb, an EMP attack is a real possibility," [Landau](#) added. "Many people in the US are concerned about EMP now, and although the public discussion hasn't begun in Israel yet, I expect that it will in the near future."

The US Congress in 2000 established the Congressional Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack. In 2004, the committee produced a 70-page executive summary on the EMP threat, and it issued a final report on the matter in 2008. According to the report, "several potential adversaries have or can acquire the capability to attack the United States with a high-altitude nuclear weapon-generated electromagnetic pulse

(EMP). A determined adversary can achieve an EMP attack capability without having a high level of sophistication.”

The impact would be devastating, the report said. “EMP is one of a small number of threats that can hold our society at risk of catastrophic consequences. EMP will cover the wide geographic region within line of sight to the nuclear weapon. It has the capability to produce significant damage to critical infrastructures and thus to the very fabric of US society, as well as to the ability of the United States and Western nations to project influence and military power,” it said.

Dr. Peter Vincent Pry was lead staffer for the Congressional committee, and he, too, is worried that Iran could use a nuclear bomb to carry out an EMP attack — on Israel and/or the US.

“Iran openly talks about using an EMP to attack Israel or the US,” said Pry, who is currently executive director of the Task Force on National and Homeland Security, a privately funded US group that seeks to educate the public and government leaders about the EMP threat to the US. According to Pry, Iran is actively preparing for an EMP attack. “Tehran has undertaken offshore exercises using Scud missiles fired and positioned in such a way that they exploded in the atmosphere — exactly the method you would use for an EMP attack,” he said.

Iran’s arsenal of atomic bombs would be no match for the US, which could obliterate any memory of Islamist Iran in a matter of minutes. But, Pry told The Times of Israel, he believes that Iran could get the most leverage out of a nuclear bomb by using it to trash large parts of the electrical grid in the US, making it easy for the Islamist regime to swoop in and act as it wishes on the world stage. “They could even marshal a major Islamic invasion of Israel, massacring the Jews and ushering in the era of the 12th Imam, the Islamic messiah, whose arrival Iran’s leadership believe is imminent,” Pry suggested grimly.

While EMP is a serious threat, there are steps governments can take to protect their electrical systems, according to Avi Schnurr, chairman and CEO of the [Electric Infrastructure Security \(EIS\) Council](#), which works with government agencies and power companies worldwide to help coordinate international efforts on electric infrastructure protection.

“In the US, the estimate is that it would cost on the order of \$1 billion to make the changes that would protect the power grid against EMP,” he told The Times of Israel. “I don’t have an estimate for Israel, but given the enormous difference in the sizes of the two countries and their power grids, it should be extremely affordable — no more than a fraction of a percent of Israel’s annual electric bill.”

“Hardening” electrical infrastructure against EMP attack would entail making some gradual changes to the power grid, such as the installation of devices like GIC (geomagnetically induced current) blockers.

Even if Iran were not developing a nuclear weapon, protecting the power grid in this manner would be a good idea, said Pry. “You don’t need a nuclear weapon to set off an EMP. You can also easily get a non-nuclear pulse generator,” he said. “They’re perfectly legal. A terrorist could detonate one next to an electrical station and effectively black out a city or region. Such weapons don’t do as much damage as a nuclear pulse does, but they are effective enough.”

In fact, when it comes to EMP, nature itself can be an enemy. “An EMP can be caused by an event like a severe solar storm,” said Pry. Such events have occurred on at least two previous occasions – [including in 1859](#), when the largest recorded geomagnetic storm ever was recorded. British astronomer Richard Carrington observed the storm’s largest flare, which caused a major coronal mass ejection (CME) to travel directly toward the Earth — leading telegraph systems all over Europe and North America to fail, in some cases shocking telegraph operators before blowing out because of the overload of electricity in the wires. (The phenomenon is named the Carrington effect, after the astronomer.)

It takes political will to do what is necessary to protect the grid, said Schnurr, and that will is beginning to show itself in Western countries, including in Israel, which, Schnurr claims, is more aware, and more active in the hardening of its grid, than most countries. “Work is going on associated with protecting the grid,” continued Schnurr. There is a greater degree and breadth of awareness on this issue, which is part of the reason why efforts have been made.”

Cost need not be a barrier, Schnurr stressed. Relatively speaking, “the cost associated with hardening the grid is quite small,” he said. Getting it done, he

said, is of the utmost priority, and that will be the great challenge of governments — from Israel to the US, and many others — in the coming period.

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