

DEFENSE MIDDLE EAST

Can Israel's new missile shield help it avoid an EMP attack?

Jakub Gorski | January 23, 2017

On January 18 Israel launched the Arrow-3 interceptor, which gives the Israeli Air Force the capability to shoot down missiles from space. Arrow-3 joins Arrow-2, David's Sling, and Iron Dome as part of the country's multi-layered anti-ballistic missile shield.

Israel's new anti-ballistic missile shield is designed to protect the country from Hamas and Hezbollah's mid-range missiles as well as Iran's long-range missiles. This upgraded missile defense shield should also be able to protect Israel from an electromagnetic pulse (EMP) attack.

An EMP is a burst of electromagnetic energy that comes in three waves. The initial burst from an EMP wave is known as E1. It is faster than lightning and will damage control systems necessary for operations of things such as the electric grid. It essentially fries some components of small electric circuitry. The second wave (E2) is as fast and strong as lightning so it can be stopped with lightning protection, but many homes and businesses lack lightning protection. An E3 wave is the slowest, but also has the most energy and is capable of causing high-voltage transformers to melt. HV transformers are a necessary component of sub-stations and enable electricity to be carried across large areas.

An EMP strike can be achieved by detonating a nuclear weapon between 30 and 400 kilometers above the Earth's surface, according to the Congressional Report on EMP attacks. This is high enough to avoid any

physical or radiological damage to people and infrastructure, but low enough for an EMP burst that will shut down electronics in a radius of 600 to 2,000 km.

This is a realistic scenario based on intelligence community projections of Iran's weapons capabilities. If Iran was to detonate a nuclear bomb in the atmosphere the resulting EMP would cover the whole of Israel. The resulting bursts would shut-down Israel's vital infrastructure and render technology-dependent army largely inoperable leaving the country open to invasion.

There are thousands of Iranian fighters in Syria and Iraq, including members of Iran's Revolutionary Guard, helping to prop-up their governments. A posture of provocative weakness for Israel under these conditions is definitely a driver of destabilization.

The U.S. cannot guarantee that Iran does not have a nuclear weapon. Right now Iran could place such a nuclear weapon on ballistic missiles, but those can be shot down using Israel's Arrow-2. The system cannot intercept ICBMs, which leaves Israel to an EMP attack from an ICBM missile.

Iran has already demonstrated the ability to fire satellites into space with the *Safir* rocket. For the *Safir* to be used as an ICBM its second stage has to be heavily modified and have a reentry vehicle. If *Safir* were to be used for an EMP attack it would not require a reentry vehicle.

All that would be necessary is for the *Safir* to have its second stage modified and then fired towards US and Israel.

However, Arrow-3 interceptors have exo-atmospheric strike capabilities allowing it to shoot down ICBMs from space. This would allow Arrow-3 to shoot down the *Safir*. So with Arrow-3 Israel should be able to safeguard itself from an ICBM based EMP attack.

Tags: Iran, Israel, Missile Shield, Nuclear Deterrence