

**U.S. National Missile Defense and the Growing Threat:  
*Is a “Limited Defense” Enough?***

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Subcommittee on Strategic Forces

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Mr. Chairman, Ranking Member Cooper and Members of the Subcommittee,

I am honored to be asked to testify before you today on this important subject.

I have incorporated in this testimony my answers to the five sets of questions sent to me by the Committee:

1). In my view, a policy of limited missile defenses against limited threats makes no sense in today's threat environment because the threat increasingly refuses to stay limited.

2). Although many types of increases and other changes will no doubt mark the development of threats in the years between now and 2020-2025, this testimony will concentrate on those posed by electro-magnetic pulses (EMPs) due to the seriousness of that threat and the role of ballistic missiles in its implementation.

EMPs are super-energetic radio waves that, in the form of coronal solar ejections by the sun, have been striking the earth since the two have existed. But it is only since the late 1850s that the existence of rudimentary electronics (e g telegraphs) have demonstrated that even the solar generation of such random pulses can destroy the electronics portion of our terrestrial infrastructure.

Then in 1962, as atmospheric nuclear tests were coming to a treaty-dictated end, some Russian and American atmospheric tests produced surprising results: destruction of electronics at great distances. It was not a nuclear blast that caused the destruction, but rather pulses generated by gamma rays and the fireball. And we have learned that modern electronics are a million times more

vulnerable to EMP than the electronics of the 1960's. In 1989, a solar-generated pulse effectively destroyed Quebec's electric grid.

For the last half-century or so the certain destruction of electronics in a nuclear war has been considered by most policymakers and students of these phenomena to be just one of the many awful things that would happen in a nuclear exchange. We have eighteen critical infrastructures and seventeen of them (food, water, communications, finances, hospitals, law enforcement, etc.) all depend directly or indirectly on the eighteenth - the electric grid. But except for some electronic shielding of portions of our strategic forces, little attention has been paid for decades to the ease of an enemy's generating EMPs by detonating a nuclear weapon that is passing above us in orbit and thus bringing our civilization to a cold, dark halt.

But the recent declassification of a substantial amount of information about EMPs, the works of Dr. Peter Pry and others, and the thorough reports of two congressional commissions and numerous other major U.S. government studies that have dealt with the subject in detail, have begun to bring attention to the issue. There is now an increasing likelihood that rogue nations such as North Korea (and before long, most likely, Iran) will soon match Russia and China in that they will have the primary ingredients for an EMP attack: simple ballistic missiles such as SCUDs that could be launched from a freighter near our shores; space launch vehicles able to launch low- earth-orbit satellites; and simple low-yield nuclear weapons that can generate gamma rays and fireballs. In 2004, the Russians told us that their "brain drain" had been helping the North Koreans develop EMP weapons.

Further, the Russians invented years ago a way to launch satellites into orbit using a trajectory that does not approach us from the north, where our few modest ballistic missile defenses are located, but rather from the south. It is called a Fractional Orbital

Bombardment System (FOBS). A missile launched to put an EMP-carrying nuclear device into orbit can come upon us from the South, and does not require accuracy, size, or numbers to be effective.

The nuclear weapon would be detonated in orbit, perhaps during its first orbit, in order to destroy much of the electric grid from above the US with a single explosion. Some of the destructive effects would reach to the horizon; others, via transmission lines, can reach further. Unlike the situation if we are attacked with a traditional nuclear missile we may not know the source of what blacks out our electric grid. It might be the sun or it might be the Iranians. We might not be able to tell.

3). The impact on our ballistic missile programs of assessing only limited threats and deploying only limited defenses makes such defenses wholly ineffective against threats such as EMP.

4). To preserve our society against our the vulnerabilities from the destruction by coronal solar ejections and by any enemy, present or future, who can obtain a simple ballistic missile and a rudimentary nuclear weapon, we must change our policy to assess these threats and deploy defenses against them. The EMP Commission estimates that within 12 months of an EMP event two-thirds of the US population would likely perish from starvation, disease, and societal breakdown. Other experts estimate the likely loss to be closer to 90 percent.

5). First of all, we need to move rapidly to harden the grid against EMP attack. Much of what needs to be done could use simple devices that already exist. The EMP Commission's cost estimate is \$2 billion. (This is the equivalent of a one-time charge of seven dollars per American—roughly the cost of a Venti Frappuccino.)

We could consider taking other steps, such as advocated by William Perry and Ashton Carter (later Secretary and Deputy Secretary of Defense) in the Washington Post seven years ago—destroy all launch vehicles of North Korea before launch. But even with the backing of two prestigious and respected advocates, applying it only to probably the world's craziest dictator, this idea never got off the launch pad. And to be thoroughly effective against EMP, it would have to include pre- or immediately post-launch destruction of all nations' launches of all types, including Russia and China. It's hard to imagine an idea that more deserves the appellation "political non-starter."

Compared to what we have today, in spite of the greater flexibility, of some types of ballistic missile defenses that we've abandoned—Brilliant Pebbles and some space-based directed energy BMD systems that could shoot down space vehicles before their ballistic missile launchers could put anything into orbit—we still don't have a good answer to our toughest problem: EMP

We need to move extremely rapidly to build resilience into our electric grid and also to put the best minds we have on this problem of defending against EMP. Now.