

Imprimis

June 2005 • Volume 34, Number 6

OVER 1,200,000 READERS MONTHLY



EMP: America's Achilles' Heel

Frank J. Gaffney, Jr.

President, Center for Security Policy



FRANK J. GAFFNEY, JR., the founder and president of the Center for Security Policy, holds an M.A. from the Johns Hopkins University School of Advanced International Studies and a B.S. from the Georgetown University School of Foreign Service. He acted in the Reagan administration as assistant secretary of defense for international security policy, following four years of service as deputy assistant secretary of defense for nuclear forces and arms control policy. Prior to that he was a professional staff member on the Senate Foreign Relations Committee chaired by the late Senator John Tower (R-Texas) and an aide to the late Senator Henry M. "Scoop" Jackson (D-Washington). He is a columnist for the *Washington Times*, *Jewish World Review* and *TownHall.com*, a contributing editor to *National Review Online* and a featured weekly contributor to Hugh Hewitt's nationally syndicated radio program. He has written for the *Wall Street Journal*, *USA Today*, the *New Republic*, the *Washington Post*, the *New York Times*, the *Christian Science Monitor*, the *Los Angeles Times* and *Newsday*. Mr. Gaffney resides in Washington, D.C.

The following is adapted from a speech delivered on May 24, 2005, in Dallas, Texas, at a Hillsdale College National Leadership Seminar on the topic, "America's War Against Islamic Terrorism."

If Osama bin Laden—or the dictators of North Korea or Iran—could destroy America as a twenty-first century society and superpower, would they be tempted to try? Given their track records and stated hostility to the United States, we have to operate on the assumption that they would. That assumption would be especially frightening if this destruction could be accomplished with a *single attack* involving just one relatively small-yield nuclear weapon—and if the nature of the attack would mean that its perpetrator might not be immediately or easily identified.

Unfortunately, such a scenario is not far-fetched. According to a report issued last summer by a blue-ribbon, Congressionally-mandated commission, a single specialized nuclear weapon delivered to an altitude of a few hundred miles over the United States by a ballistic missile would be "capable of causing catastrophe for the nation." The source of such a cataclysm might be considered the ultimate "weapon of mass destruction" (WMD)—yet it is hardly ever mentioned in the litany of dangerous WMDs we face today. It is known as electromagnetic pulse (EMP).



How EMP Works

A nuclear weapon produces several different effects. The best known, of course, are the intense heat and overpressures associated with the fireball and accompanying blast. But a nuclear explosion also generates intense outputs of energy in the form of x- and gamma-rays. If the latter are unleashed outside the Earth's atmosphere, some portion of them will interact with the upper atmosphere's air molecules. This in turn will generate an enormous pulsed current of high-energy electrons that will interact with the Earth's magnetic field. The result is the instantaneous creation of an invisible radio-frequency wave of uniquely great intensity—roughly a million-fold greater than that of the most powerful radio station.

The energy of this pulse would reach everything in line-of-sight of the explosion's center point at the speed of light. The higher the altitude of the weapon's detonation, the larger the affected terrestrial area would be. For example, at a height of 300 miles, the entire continental United States, some of its offshore areas and parts of Canada and Mexico would be affected. What is more, as the nuclear explosion's fireball expands in space, it would generate additional electrical currents in the Earth below and in extended electrical conductors, such as electricity transmission lines. If the electrical wiring of things like computers, microchips and power grids is exposed to these effects, they may be temporarily or permanently disabled.

Estimates of the combined direct and indirect effects of an EMP attack prompted the Commission to Assess the Threat to the United States from Electromagnetic Pulse Attack to state the following in its report to Congress¹:

The electromagnetic fields produced by weapons designed and deployed with the intent to produce EMP have a high likelihood of damaging electrical power systems, electronics, and information systems upon which American society depends. Their effects on dependent systems and infrastructures could be sufficient to qualify as catastrophic to the nation.

If it seems incredible that a single weapon could have such an extraordinarily destructive

effect, consider the nature and repercussions of the three distinct components of an electromagnetic pulse: fast, medium and slow. The “fast component” is essentially an “electromagnetic shock-wave” that can temporarily or permanently disrupt the functioning of electronic devices. In twenty-first century America, such devices are virtually everywhere, including in controls, sensors, communications equipment, protective systems, computers, cell phones, cars and airplanes. The extent of the damage induced by this component of EMP, which occurs virtually simultaneously over a very large area, is determined by the altitude of the explosion.

The “medium-speed component” of EMP covers roughly the same geographic area as the “fast” one, although the peak power level of its electrical shock would be far lower. Since it follows the “fast component” by a small fraction of a second, however, the medium-speed component has the potential to do extensive damage to systems whose protective and control features have been impaired or destroyed by the first onslaught.

If the first two EMP components were not bad enough, there is a third one—a “slow component” resulting from the expansion of the explosion's fireball in the Earth's magnetic field. It is this “slow component”—a pulse that lasts tens of seconds to minutes—which creates disruptive currents in electricity transmission lines, resulting in damage to electrical supply and distribution systems connected to such lines. Just as the second component compounds the destructive impact of the first, the fact that the third follows on the first two ensures significantly greater damage to power grids and related infrastructure.

The EMP Threat Commission estimates that, all other things being equal, it may take “months to years” to bring such systems fully back online. Here is how it depicts the horrifying ripple effect of the sustained loss of electricity on contemporary American society:

Depending on the specific characteristics of the attacks, unprecedented cascading failures of our major infrastructures could result. In that event, a regional or national recovery would be long and difficult and would seriously degrade the safety and overall viability of our nation. The primary avenues for catastrophic damage to the nation are through our electric power infrastructure and thence into our telecom-

¹ The unclassified executive summary of this report can be viewed at <http://empcreport.ida.org>.

Barcelona · Málaga · Cádiz · Casablanca · Canary Islands · Madeira · Portimão · Lisbon

InterShow Presents

Hillsdale COLLEGE CRUISE



THE FIGHT FOR FREEDOM

Barcelona to Lisbon · October 25 - November 6, 2005
Aboard the Six-Star Crystal Serenity

CONFIRMED SPEAKERS INCLUDE:

Just Announced!



Jose Maria Aznar

Former Prime Minister of Spain

To Speak During a Special Pre-Cruise Program In Barcelona



David Pryce-Jones

Senior Editor,
National Review

Author, *The Closed Circle: An Interpretation of the Arabs*



Victor Davis Hanson

Distinguished Fellow,
Hillsdale College

Author, *A War Like No Other*



Robert Conquest

Senior Research Fellow,
Hoover Institution

Author, *The Dragons of Expectation*



Larry P. Arnn

President,
Hillsdale College

Author, *Liberty and Learning*



CABIN RATES (per couple)

CATEGORY	REGULAR RATE	HILLSDALE RATE
PS	\$37,290	\$27,390
PH	\$29,550	\$20,590
AA	\$21,700	\$11,890
A	\$20,320	\$10,890
B	\$19,480	\$10,590
C	\$17,310	\$ 7,090
Promenade	\$16,310	\$ 6,090

For more information or to reserve your cabin call
(800) 797-9519. Space is limited!

munications, energy, and other infrastructures. These, in turn, can seriously impact other important aspects of our nation's life, including the financial system; means of getting food, water, and medical care to the citizenry; trade; and production of goods and services.

The recovery of any one of the key national infrastructures is dependent on the recovery of others. The longer the outage, the more problematic and uncertain the recovery will be. It is possible for the functional outages to become mutually reinforcing until at some point the degradation of infrastructure could have irreversible effects on the country's ability to support its population.

The EMP Threat Today

The destructive power of electromagnetic pulses has been recognized by the United States national security community for some time. The EMP Threat Commission noted that

EMP effects from nuclear bursts are not new threats to our nation. . . . Historically, [however,] this application of nuclear weaponry was mixed with a much larger population of nuclear devices that were the primary source of destruction, and thus EMP as a weapons effect was not the primary focus.

As long as the Cold War threat arose principally from the prospect of tens, hundreds or even thousands of nuclear weapons detonating on American soil, such attention as was given to protecting against EMP effects was confined to shielding critical components of our strategic forces. The military's conventional forces were generally not systematically "hardened" against such effects. And little, if any, effort was made even to assess—let alone to mitigate—the vulnerabilities of our civilian infrastructure. As the theory went, as long as our nuclear deterrent worked, there was no need to worry about everything else. If, on the other hand, deterrence failed, the disruptions caused by EMP would be

pretty far down the list of things about which we would have to worry.

Unfortunately, today's strategic environment has changed dramatically from that of the Cold War, when only the Soviet Union and Communist China could realistically threaten an EMP attack on the United States. In particular, as the EMP Threat Commission put it:

The emerging threat environment, characterized by a wide spectrum of actors that include near-peers, established nuclear powers, rogue nations, sub-national groups, and terrorist organizations that either now have access to nuclear weapons and ballistic missiles or may have such access over the next 15 years, have combined to raise the risk of EMP attack and adverse consequences on the U.S. to a level that is not acceptable.

Worse yet, the Commission observed that "some potential sources of EMP threats are difficult to deter." This is particularly true of "terrorist groups that have no state identity, have only one or a few weapons, and are motivated to attack the U.S. without regard for their own safety." The same might be said of rogue states, such as North Korea and Iran. They "may also be developing the capability to pose an EMP threat to the United States, and may also be unpredictable and difficult to deter." Indeed, professionals associated with the former Soviet nuclear weapons complex are said to have told the Commission that some of their ex-colleagues who worked on advanced nuclear weaponry programs for the USSR are now working in North Korea.

Even more troubling, the Iranian military has reportedly tested its Shahab-3 medium-range ballistic missile in a manner consistent with an EMP attack scenario. The launches are said to have taken place from aboard a ship—an approach that would enable even short-range missiles to be employed in a strike against "the Great Satan." Ship-launched ballistic missiles have another advantage: The "return address" of the attacker may not be confidently fixed, especially if the missile is a generic Scud-type weapon available in many arsenals around the world. As just one

Imprimis Endowment Acknowledgements

Our thanks to Gene and Carol LaSchober of Georgia and to the Castle Rock Foundation of Colorado for generously supporting *Imprimis*. Their major endowed gifts help us reach thousands of new subscribers each year.

example, in December 2002, North Korea got away with delivering twelve such missiles to Osama bin Laden's native Yemen. And Al Qaeda is estimated to have a score or more of sea-going vessels, any of which could readily be fitted with a Scud launcher and could try to steam undetected within range of our shores.

The EMP Threat Commission found that even nations with whom the United States is supposed to have friendly relations, China and Russia, are said to have considered limited nuclear attack options that, unlike their Cold War plans, employ EMP as the primary or sole means of attack. Indeed, as recently as May 1999, during the NATO bombing of the former Yugoslavia, high-ranking members of the Russian Duma, meeting with a U.S. congressional delegation to discuss the Balkans conflict, raised the specter of a Russian EMP attack that would paralyze the United States.

America the Vulnerable

What makes the growing EMP attack capabilities of hostile (and potentially hostile) nations a particular problem for America is that, in the words of the EMP Threat Commission, “the U.S. has developed more than most other nations as a modern society heavily dependent on electronics, telecommunications, energy, information networks, and a rich set of financial and transportation systems that leverage modern technology.” Given our acute national dependence on such technologies, it is astonishing—and alarming—to realize that:

- Very little redundancy has been built into America's critical infrastructure. There is, for example, no parallel “national security power grid” built to enjoy greater resiliency than the civilian grid.
- America's critical infrastructure has scarcely any capacity to spare in the event of disruption—even in one part of the country (recall the electrical blackout that crippled the northeastern U.S. for just a few days in 2003), let alone nationwide.
- America is generally ill-prepared to reconstitute damaged or destroyed electrical and electricity-dependent systems upon which we rely so heavily.

These conditions are not entirely surprising. America in peacetime has not traditionally given thought to military preparedness, given our highly efficient economy and its ability to respond quickly when a threat or attack arises. But EMP threatens to strip our economy of that ability, by rendering the infrastructure on which it relies impotent.

In short, the attributes that make us a military and economic superpower without peer are also our potential Achilles' heel. In today's world, wracked by terrorists and their state sponsors, it must be asked: Might not the opportunity to exploit the essence of America's strength—the managed flow of electrons and all they make possible—in order to undo that strength prove irresistible to our foes? This line of thinking seems especially likely among our Islamofascist enemies, who disdain such man-made sources of power and the sorts of democratic, humane and secular societies which they help make possible. These enemies believe it to be their God-given responsibility to wage jihad against Western societies in general and the United States in particular.

Calculations that might lead some to contemplate an EMP attack on the United States can only be further encouraged by the fact that our ability to retaliate could be severely degraded by such a strike. In all likelihood, so would our ability to assess against whom to retaliate. Even if forward-deployed U.S. forces were unaffected by the devastation wrought on the homeland by such an attack, many of the systems that transmit their orders and the industrial base necessary to sustain their operations would almost certainly be seriously disrupted.

The impact on the American military's offensive operations would be even further diminished should units based outside the continental United States also be subjected to EMP. Particularly with the end of the Cold War, the Pentagon has been reluctant to pay the costs associated with shielding much of its equipment from electromagnetic pulses. Even if it had been more willing to do so, the end of underground nuclear testing in 1992 denied our armed forces their most reliable means of assessing and correcting the EMP vulnerabilities of weapon systems, sensors, telecommunications gear and satellites.

The military should also be concerned that although the sorts of shielding it has done in the past may be sufficient to protect against the EMP effects of traditional nuclear weapons designs, weapons optimized for such effects may

well be able to defeat those measures. Without a robust program for assessing and testing advanced designs, we are unlikely to be able to quantify such threats—let alone protect our military hardware and capabilities against them.

What is to be Done?

If the EMP Threat Commission is correct about the phenomenon of electromagnetic pulse attacks, the capabilities of our enemies to engage in these attacks and the effects of such attacks on our national security, cosmopolitan society and democratic way of life, we have no choice but to take urgent action to mitigate this danger. To do so, we must immediately engage in three focused efforts:

First, *we must do everything possible to deter EMP attacks against the United States.* The EMP Threat Commission described a comprehensive approach:

We must make it difficult and dangerous to acquire the materials to make a nuclear weapon and the means to deliver them. We must hold at risk of capture or destruction anyone who has such weaponry, wherever they are in the world. Those who engage in or support these activities must be made to understand that they do so at the risk of everything they value. Those who harbor or help those who conspire to create these weapons must suffer serious consequences as well.

To be effective, these measures will require vastly improved intelligence, the capacity to perform clandestine operations the world over, and the assured means of retaliating with devastating effect. The latter, in turn, will require not only forces capable of carrying out such retaliation in the aftermath of an EMP attack, but also the certain ability to command and control those forces. It may also require the communication, at least through private if not public channels, of the targets that will be subjected to retaliation—irrespective of whether a definitive determination can be made of culpability.

Second, *we must protect to the best of our ability our critical military capabilities and civilian infrastructure from the effects of EMP attacks.* This will require a comprehensive assessment of our vulnerabilities and proof of the effectiveness of corrective measures. Both of these may require, among other things, periodic underground nuclear testing.

The EMP Threat Commission judged that, given the sorry state of EMP-preparedness on the part of the tactical forces of the United States and its coalition partners, “It is not possible to protect [all of them] from EMP in a regional conflict.” But it recommended that priority be given to protecting “satellite navigation systems, satellite and airborne intelligence and targeting systems [and] an adequate communications infrastructure.”

Particularly noteworthy was the Commission’s recommendation that America build a ballistic missile defense system. Given that a catastrophic EMP attack can be mounted only by putting a nuclear weapon into space over the United States and that, as a practical matter, this can only be done via a ballistic missile, it is imperative that the United States deploy as quickly as possible a comprehensive defense against such delivery systems. In particular, every effort should be made to give the Navy’s existing fleet of some 65 AEGIS air defense ships the capability to shoot down short- to medium-range missiles of the kind that might well be used to carry out ship-launched EMP strikes.

Third, *an aggressive and sustained effort must be made to plan and otherwise prepare for the consequences of an EMP attack in the event all else fails.* This will require close collaboration between government at all levels and the private sector, which owns, designs, builds, and operates most of the nation’s critical infrastructure. Among other things, we will need to do a far better job of monitoring that infrastructure and remediating events that could ensue if EMP attacks are made on it. We must also ensure that we have on hand, and properly protected, the equipment and parts—especially those that are difficult or time-consuming to produce—needed to repair EMP-damaged systems. The EMP Threat Commission identified the latter as including “large turbines, generators, and high-voltage transformers in electrical power systems, and electronic switching systems in telecommunications systems.”

Conclusion

We have been warned. The members of the EMP Threat Commission—who are among the nation’s most eminent experts with respect to nuclear weapons designs and effects—have rendered a real and timely public service. In the aftermath of their report and in the face of the dire warnings they have issued, there is no excuse

continued on next page (detach envelope)



Imprimis ORDER FORM



Name Dr. Mr.
 Mrs. Ms. Miss

Address _____

City _____ State _____ ZIP _____

Email _____ Telephone (____) _____
 Home Office

1-10 copies 50¢ each • 25-\$10 • 50-\$15 • 100-\$25

FREE SHIPPING!

Enclosed is my tax-deductible contribution to Hillsdale College for \$_____

My check made payable to **Hillsdale College** is enclosed.

Please charge my: VISA MC Discover

Exp. Date _____

Card No. _____

Signature _____

Qty.	Author/Title	Price
Subtotal		
Michigan residents, add 6% sales tax		
TOTAL		

For more information, check areas that interest you:

- Center for Constructive Alternatives on-campus seminars
 National Leadership Off-Campus Seminars
 Hillsdale Academy Reference Guide
 Hillsdale College Admissions
 Hillsdale College Athletics
- Center for Teacher Excellence
 Hillsdale Hostel
 Gift and Estate Planning
 Freedom Library Catalog (books and tapes)



continued from page 6

for our continued inaction. Yet this report and these warnings continue to receive inadequate attention from the executive branch, Congress and the media. If Americans remain ignorant of the EMP danger and the need for urgent and sustained effort to address it, the United States will continue to remain woefully unprepared for one of the most serious dangers we have ever faced. And by remaining unprepared for such an attack, we will invite it.

The good news is that steps can be taken to mitigate this danger—and perhaps to prevent an EMP attack altogether. The bad news is that there will be significant costs associated with those steps, in terms of controversial policy changes and considerable expenditures. We have no choice but to bear such costs, however. The

price of continued inaction could be a disaster of infinitely greater cost and unimaginable hardship for our generation and generations of Americans to come.



Editor, Douglas A. Jeffrey; Deputy Editor, Timothy W. Caspar; Assistant to the Editor, Patricia A. DuBois. The opinions expressed in **Imprimis** are not necessarily the views of Hillsdale College. Copyright © 2005. Permission to reprint in whole or in part is hereby granted, provided the following credit line is used: "Reprinted by permission from **Imprimis**, the national speech digest of Hillsdale College, www.hillsdale.edu." **SUBSCRIPTION FREE UPON REQUEST.** ISSN 0277-8432. **Imprimis** trademark registered in U.S. Patent and Trade Office #1563325.