

Dr. George H. Baker

May 30th, 2025

Mr. Steve Volandt
President, Foundation for Infrastructure Resilience

Subject: Continuing Harmful Misrepresentation of EMP/GMD Risks to Critical Infrastructure

Dear Steve:

I see continuing evidence that the Department of Energy and the US Electric Power Industry are downplaying or ignoring the EMP threat and its consequences. A case in point that has most recently crossed my desk is a Los Alamos National Laboratory newsletter article from 2024 (attached) that associates EMP effects with "science fiction." This article typifies DOE and Electric Power Research Institute pieces over the last several years that misrepresent both EMP threat levels and system susceptibility levels.

Having served as an EMP Commission staff member throughout its three terms from 2001 to 2017, and having supported and interacted with Commissioners who were members and affiliates of the DOE laboratories, it grieves me to see a new generation of DOE scientists disregard and directly contradict the findings and recommendations of their own distinguished colleagues. EMP Commissioners with strong ties to the DOE and its laboratories included:

- Dr. John S. Foster, Director of LLNL and Associate Director of the Lawrence Berkeley National Laboratory
- Dr. Joan B. Woodard, Executive Vice President and Deputy Laboratories Director for Nuclear Weapons at Sandia National Laboratories.
- Mr. Earl Gjelle, Counselor to the Secretary and Chief Operating Officer of the U.S. Department of Energy; and Deputy Administrator, Power Manager and Chief Operating Officer of the Bonneville Power Administration
- Lowell L. Wood, LLNL Affiliate, Recipient of the U.S. Department of Energy's Lawrence Award for outstanding contributions to national security in the areas of nuclear weapon design concepts, directed energy, inertial confinement fusion, and computer technology.

The article reveals that DOE is now rewarding those who have chosen to reject the EMP Commission's findings and recommendations for protecting our critical infrastructure against EMP. For example, the attached article implies that EMP protection is merely a matter of rebooting IT systems. Today's lauded DOE members' conclusions overlook the fact that, with complex interconnected systems, such as our critical infrastructure networks, loss of just a few

network elements can incapacitate entire networks over large geographic areas including transmission/distribution power grids, and local and national internet/telecommunication networks. This "domino effect" problem has been confirmed (although over limited regions and time scales) by actual catastrophes, including the NE power grid collapse, cyber-attacks on single financial and communication hubs, and the recent the large-scale Iberian Peninsula power grid collapse. Because it exposes large regions, EMP will damage unprotected systems at numerous, diverse locations with cascading network effects that span continental-scale regions and with restoration times of months to years.

If we adhere to the current DOE thinking, our nation, if subjected to EMP or a 100-year solar GMD, risks long-term outages of critical infrastructure systems including electric power, internet, financial, and transportation systems whose loss would threaten the lives of large portions of the U.S. population. This risk can and must be averted.

Present DOE and Electric Industry principals should be advised by the late Henry Kissinger's caution: "A policymaker can always avoid coming to grips with a problem by making a projection of probable events which requires little action. Assumptions about the course of history can serve as a substitute for effort. The wise policymaker knows that he is responsible not only for the best thing that could happen but also for the worst. He cannot entrust the survival of his society entirely to guesses. If his estimate turns out to be inaccurate it will be too late to do anything about it."

My sincere thanks to you and the Foundation for Infrastructure Resilience for your endeavor to overcome the present convenient DOE and power industry assumptions and marshal informed efforts to protect our most crucial, life-supporting infrastructures.

Sincerely,



George H. Baker, Ph.D.

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Director Emeritus, Institute for Infrastructure, and Information Assurance, JMU

Director Emeritus, Foundation for Resilient Societies

Former Director, Springfield Research Facility, Defense Threat Reduction Agency

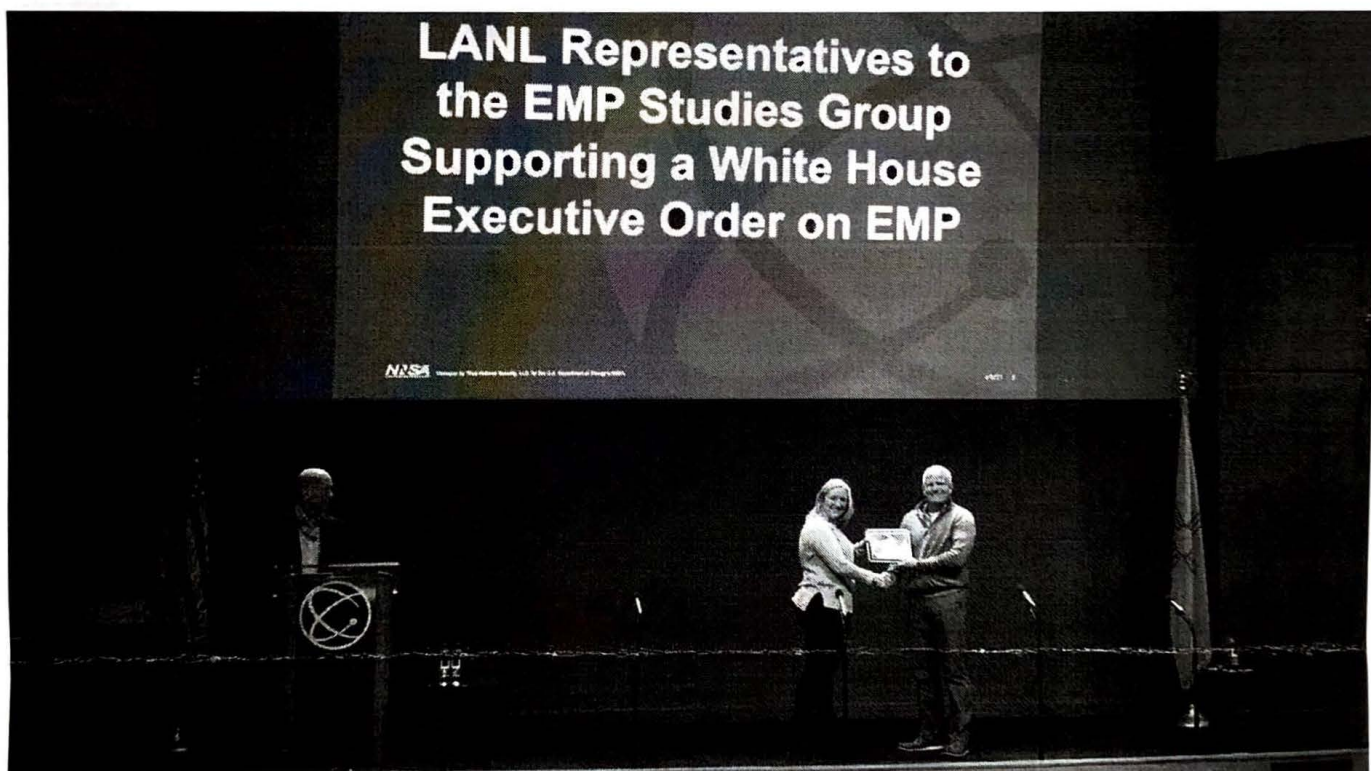
National Security Council, Resilience Directorate, Trump 45 Administration

1 attachment

A Los Alamos physicist debunks myths about electromagnetic pulse.

April 2, 2024

Jill Gibson



Summer Jones, assistant deputy administrator for Production Modernization in Defense Programs at the National Nuclear Security Administration, presented a Defense Programs Award of Excellence to Jim Cooley on March 20, 2023. Cooley was recognized for leading a team that completed several studies that characterized the impacts of EMP on critical infrastructure. Credit to: Los Alamos National Laboratory

It's a scene out of a science fiction movie: A nuclear detonation creates a burst of electromagnetic energy that wipes out communication and electronic equipment and disables the nation's power grids. From the internet to cell phones, all systems fail. Chaos erupts as America is thrown back into the dark ages—all technology and critical infrastructure suddenly gone.

Could that actually happen? Los Alamos National Laboratory physicist Randy Bos says, "Probably not."

Bos is a **nuclear weapons effects** specialist who has researched weapons effects for decades and has provided nuclear detonation response guidance for Federal Emergency Management Agency teams. "Yes, we know a nuclear explosion will generate an electromagnetic pulse (EMP), which, depending on the circumstances, could disrupt certain electronic equipment, but the doom and gloom scenarios will not happen. **That stuff belongs in Hollywood,**" he says.

Bos explains that researchers first discovered that nuclear weapons generate a burst of electromagnetic energy in 1962, when a high-altitude nuclear test, called Starfish Prime, detonated above the Pacific Ocean and hundreds of streetlights in Oahu, Hawaii, more than 700 miles away, went dark.

Nuclear explosions generate gamma rays that can react with air molecules, causing a powerful wave of electromagnetic energy—electric and magnetic fields traveling at the speed of light. Because of the way high-altitude denotations interact with the atmosphere and the Earth's magnetic field, high-altitude EMPs can be especially destructive, having the potential for far-reaching effects on electrical and electronic systems. Bos notes that during nuclear detonations near or on the Earth's surface, areas that would experience significant EMP effects would also be severely impacted by air blast, thermal radiation, and fire. "When you're at ground zero of a near-surface detonation, EMP isn't going to be the biggest concern."

EMPs pose no threat to people, but they can cause dramatic voltage surges that may impact everything from car engines to cell phone transmitters. Bos says the key word here is "may." The crippling devastation EMPs produce in the movies are highly unlikely, according to Bos.

"In general, the EMP must occur at the right place and the right orientation to have a significant impact," Bos says. "There are multiple factors that must coincide."

Bos notes that the U.S. national laboratories and other government agencies are working with industry experts to study and develop systems that can withstand all types of electromagnetic disturbances. A 2019 executive order prioritized research and development to address the potential danger of an EMP. Los Alamos scientists are supporting that order through projects that calculate EMP effects and electrical power grid performance.

Bos says scientists have digitized and analyzed EMP data from historical testing and EMP emulators—devices that mimic the output of an EMP. They've also used computer simulations to examine EMP impacts. Multiple government studies have examined the EMP threat, and private companies have researched how an EMP will affect telecommunications and power grids.

The risks of EMPs are similar to those of geomagnetic storms—naturally occurring disturbances in the space around the Earth controlled by the planet's magnetic field. "The power industry has done a great deal of work to protect the nation's electric grid from power surges and potential outages

caused by geomagnetic storms,” says Bos, pointing out those measures also mitigate against a nuclear explosion-generated EMP.

“These technological advances and hardening measures help protect electrical production facilities, transformers, and power distribution lines,” Bos says. “There was a period of time in the development of electronics, the power grid, and communications technology when the EMP threat would have been greater, but now most of the equipment will not be affected. Some unlucky people may end up with fried electronics, but most of us, at the worst, will just have to reboot our computer or cell phone.” ★

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