Volume 1, Issue 1

OCTAVIAN REPORT

Fall 2014

SOLAR FLARES AND ELECTROMAGNETIC PULSES

BY **DEE SMITH**

In our exclusive interview, Vice President Cheney discussed risks about attacks from an electromagnetic pulse and his concerns about our preparedness. In contrast to convention attacks, an EMP would initially harm no one but leave cities unlivable and wreak havoc. The Octavian Report asked Gordon "Dee" Smith, chief executive officer of the private intelligence firm Strategic Insight Group, to explain what an EMP attack is and how subscribers can protect themselves and their businesses.

Imagine a 'post-Katrina'-type environment — no electricity, no running water, no food deliveries, no access to money, no phones — imposed instantly on every urban area in the United States, lasting for months if not years. That could be the catastrophic outcome of an electromagnetic pulse, a very serious but little-known threat. For years, scientists have warned of this threat — which can emerge from either natural or man-made sources — but the US remains largely unprepared. Even worse, there are no plans to fix the problem any time soon, despite the relatively low costs of doing so. Individuals and businesses need to plan accordingly to protect themselves to the extent possible.

An EMP, as it is often called, is a short-duration release of electromagnetic energy, like a bolt of lightning. But while lightning can cause damage, its destructive power is dwarfed by the potential of much more powerful EMPs that can be generated naturally by the sun or artificially by hostile states or even terrorists. Such an incident would constitute a threat of widespread and potentially devastating scope.

On September 1, 1859, a massive solar flare known as the Carrington Event impacted the United States and Europe directly. The electrical infrastructure at the time — limited largely to the telegraph — was minimal, but the damage from the flare was nevertheless remarkable. Telegraph systems failed, operators received shocks, and in some cases sparks and fires on telegraph equipment, lines, and poles were reported. *Aurora borealis* effects were seen as far south as the Caribbean, and were so bright on the East Coast of the US that newspapers could be read from their light. Today, such an event would be devastating. Under

certain circumstances it could, in a matter of an hour or two, cripple much of the global technological infrastructure, from GPS satellites to computer systems to the electrical grid itself. And it is clear that solar flares of varying magnitude are

relatively frequent events geologically.

As disturbing as such a natural threat is, the possibility of an intentional man-made EMP may be even more immediate. The greatest concerns are nuclear EMPs and in particular high-altitude nuclear EMPs. An EMP attack could be created by exploding a warhead more than one hundred miles above the surface of the earth. Although the direct physical effects of an EMP on people, animals and even buildings would be negligible, the effects on the electrical system would be immediate and catastrophic. In our electric world, the effect would be devastating.

An EMP attack is well within the capabilities of even a small nuclear power that has a ballistic missile delivery system. A particularly powerful warhead is not required nor is pinpoint accuracy. All that is necessary is to detonate a nuclear device at a point over the north-central area of the United States at a sufficient altitude. A single rogue state like Iran or North Korea could, with some luck, launch a devastating strike or empower terrorists to do so as proxies. And a wealthy terrorist organization like ISIS — which may have up to $1 billion in looted cash — could conceivably purchase both the nuclear and delivery devices. At least in theory such an attack could be launched from an island or a ship off the US coast in the Atlantic, Pacific, Gulf of Mexico, or Caribbean, or exploded on a satellite in orbit.

How exactly does an EMP wreak its havoc? It creates a massive burst of energy in three phases. First, a very short and very intense radiated pulse, lasting less than one hundredth of a second, would severely damage unprotected solid-state electronic equipment such as computer systems. Standard surge suppressors would not protect against it. Then a second pulse, very similar to lightning, would follow, preying on property and infrastructure made vulnerable after the first pulse damaged lightning defense systems. The third and final signal would be longer, and could devastate the electrical grid like the powerful solar storm of 1859. This last pulse would transmit a massive wave of energy into the large transformers that underpin the electric power grid. Many would be severely damaged and would take months to repair — if indeed they could be with no power and no working computer systems. The domino effect would be horrific, potentially knocking off all sixteen defined "critical infrastructure" sectors — from financial services to agriculture to water and wastewater, healthcare, and transportation. This risk exists for essentially every nation on earth.

"An EMP attack is well within the capabilities of even a small nuclear power that has a ballistic missile delivery system. A particularly powerful warhead is not required nor is pinpoint accuracy. All that is necessary is to detonate a nuclear device at a point over the north-central area of the United States at a sufficient altitude. "

So what can be done to mitigate the risk? At the national level, besides good intelligence and the deployment of an anti-ballistic missile system, electric systems and infrastructure can be hardened against EMP. In fact, a very basic program to protect the thousand most vulnerable transformers might be accomplished for around $150 million. A more extensive US program could cost $2 billion, and a robust program might cost up to $12 billion: still a very small and affordable sum

compared to the potential losses. The American and other militaries have made significant strides over time in doing this. But civilian infrastructures are vastly under-protected. The SHIELD Act (Secure High-voltage Infrastructure for Electricity from

Lethal Damage Act), introduced in Congress in June 2013, would require development of standards for protection of the civilian infrastructure from both natural and manmade EMP.

The good news is that early warning of solar storms is quite feasible. The most damaging part of a solar storm generally takes twenty or more hours to reach the earth, but it can be seen in just eight minutes. This provides time to mitigate the effects. Foremost among these is to protect transformers by taking them offline — literally, turning off the electrical grid — before the storm strikes. Subscribers should take steps to obtain such early warning — one source is the federal government's Space Weather Prediction Center at www.swpc.noaa.gov — and have a contingency plan for such a temporary power outage to take their own equipment offline during the advance window.

But what can individuals and businesses do to mitigate any impact from an EMP? For a low-level event, planning is similar to any potential calamity. Individuals should keep a few weeks of non-perishable food, water, and medicine on hand. Business interruption is obviously a key concern. An EMP event could significantly disrupt supply chains, cause cancellation of events, and limit access to basic records. Contingency planning focusing on local sourcing is important. Backups of key computer records should be made daily and stored on tape or DVD away from equipment that might be damaged in such an event. A radio with the batteries removed and stored separately, or a hand-cranked rechargeable radio, is also a recommended addition, as is some amount of cash. These elements would be very helpful in surviving a moderate EMP. However, the problem with a very large and widespread EMP event — whether natural or man-made — is the systemic damage that would be particularly dramatic if it led to power loss for weeks or months.

"The impact on the global financial system of an attack on a major money center would be catastrophic, and businesses in general would face massive problems because without power, tape or disk backups of data that most companies rely on would be rendered useless and banking records could be wiped out. "

The impact on the global financial system of an attack on a major money center would be catastrophic, and businesses in general would face massive problems because without power, tape or disk backups of data that most companies rely on would be rendered useless and banking records could be wiped out. Thinking about dealing with your own data and equipment is something worth doing now. Electrical equipment, including computers, should ideally be unplugged when not in use rather than be kept in the always-on sleep mode prevalent today, and then restarted when turned on. Most people and enterprises will not realistically do this in our busy world, making some damage inevitable. At a minimum, then, paper records of key documents, such as bank statements and identification papers, and information should be printed monthly or at some other relevant frequency and securely stored.

In short: think analog for critical records, have good contingency plans and supplies needed for any emergency, and develop the ability to go off line if in fact warnings of a potential EMP are possible. The rest is dependent on government and security,

along with the political will to take the farsighted steps necessary to prevent the possible devastation of such an attack on our electric grid. The most important step subscribers could take is in fact to pressure the US government to take the necessary action on the matter as quickly as possible.

Dee Smith is the CEO of Strategic Intelligence Group.