

Thoughts Before The Grid Goes Down

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March 2017

There are five dangers to the power grids which provide electricity to us here on Earth. These include:

- Destruction through man-made attacks, especially an EMP attack
- Geomagnetic Storms
- Changes in the Earth's magnetic poles and resulting loss of protection from solar storms and cosmic rays
- Destruction from natural disasters (volcanic eruptions, hurricanes and earthquakes)
- Terrorist Attacks

We will take a brief look at each of these causes, and comment on potential effects on the power grid.

EMP Attacks

On May 31, 2015, Dr. Peter Pry, Executive Director of the Task Force on National and Homeland Security testified before the senate. He warned that a rogue state or terrorist could attack the United States with an EMP (electromagnetic pulse) weapon that would kill 9 out of 10 Americans through starvation, disease, and societal collapse. Dr. Pry described a scenario whereby a nuclear device could be detonated over the US, generating an EMP that would cause catastrophic damage to our nation's electricity grid. The result would start with national power outages, leading to millions of deaths from starvation, disease and political unrest.

Natural EMP events include lightning, electrostatic discharge (which happens when two charged objects are placed close to each other), and a coronal mass ejection or CME (when a burst of charged plasma is released into the solar wind). CMEs will be discussed further in the Geomagnetic Storms section. Military EMP events include nuclear and non-nuclear electromagnetic pulses. A large EMP event induces high currents and voltages in electronic devices, leading to disruption of functionality or destruction of the device.

When an electromagnetic pulse (EMP) weapon is detonated, the gamma radiation photons from the bomb deflect electrons from nitrogen and oxygen atoms in the atmosphere. These free electrons interfere with the Earth's magnetic field by producing a fluctuating electrical current, which then induces a potent magnetic field, known as the Compton Effect. The electromagnetic pulse induces an enormous electrical current in conductive materials such as power lines, ultimately destroying them and any of the electrical devices to which they are connected.

Geomagnetic Storms

Not only could a bomb cause an EMP and knock out our power grid, but so could a coronal mass ejection (CME) from our sun which would produce a Geomagnetic storm. These can happen any day - and do, as a matter of fact. Even though they hit the earth relative infrequency, several documented geomagnetic storms that hit us over a century ago would have caused massive damage and destruction had they hit our planet today. Let's take a look at these well-documented geomagnetic storms and the damage they caused, even years ago.

The Carrington Event of 1859 ripped through telegraph lines, burned paper close to the

equipment, and brought rainbow-colored auroras as far south as Hawaii. Buildings burned up due to electrical fires resulting from charges coming down telegraph lines.

NASA says Solar Storm of 1921, if it occurred today, would have killed over 280 million people. Auroras were seen multiple evenings over Europe and the Eastern United States. Most of the East Coast experienced a multi-day blackout. The signal and switching system for the the New York Central Railroad were completely shut down because of the event. A fire broke out in the areas of 57th Street and Park Avenue. One telegraph operator stated that his switchboard burst in flames, which caused the entire building to become engulfed by fire. A comparable fire was reported from a telephone station in Sweden that morning too. This destructive solar storm from almost a century ago impacted telephone, telegraph and cable traffic throughout Europe.

On March 13, 1989, a geomagnetic storm caused over six million people in the area of Quebec, Canada to lose their power. The storm tripped circuit breakers on Hydro-Québec's power grid, resulting in a nine-hour power outage. The auroras from this CME could be seen as far south as Texas and Florida.

In January 2005, a giant spot materialized on the sun and began exploding, sending solar flares in the direction of Earth. From January 15-19, sunspot 720 produced four powerful solar flares. The fifth explosion, on January 20, sent X-rays from a solar flare that disrupted satellite-to-ground communication and the GPS system for about 10 minutes — threatening satellite-guided air, sea, and land travel. NASA noted that had astronauts been on the moon at that time, they would have been exposed to this deadly radiation and would have had no real protection from its deadly effects.

On March 5, 2017 (yes - just a few days ago), a coronal mass ejection (CME) came from the sun late during the day. That one, had it been directed toward toward Earth, would have simply fried our power grids. Clearly, CMEs and related geomagnetic storms represent a clear and present danger to our planet, and our civilization.

Pole Shifts

While we have not yet experienced this in our lifetimes, the Earth's magnetic poles do shift. The Earth's magnetic field extends some 370,000 miles out from the surface of our planet and protects us from harmful solar radiation. A shifting of the poles definitely decreases the magnetic field, putting both the power grid and humans (in the form of potentially cancer-producing radiation) at additional risk.

Every couple of thousand years, magnetic north and south will actually flip, and a compass will actually point toward south! Right now, evidence suggests that magnetic north is moving toward Siberia. In general, magnetic pole reversals occur about every 250,000 years. Currently, it has been over 700,000 years since the last pole reversal. The odds are this event will happen some time in the next one to two thousand years.

Along with this interesting phenomenon, the general magnetic field will increase and decrease. Recently, the magnetic field over North and South America has been decreasing. However, it has been increasing over the Indian Ocean.

Natural Disasters

Severe weather counts for the majority of power outages In 2012, for example, Superstorm Sandy resulted in more than \$50 billion in damage, 147 deaths, and knocked out power to more than 8 million people—in a few cases, for months. Hurricane Katrina destroyed thousands of homes in Louisiana. Hurricane Hazel, in 1954, almost completely destroyed the seaside resort of Myrtle Beach, SC.

Volcanoes

In 1815, a massive eruption took place at Mount Tambora, in Indonesia. This caused the "Year Without a Summer" in the northern hemisphere, resulting in massive starvation in the heavily (for that time) areas of US/Canada, Europe and China. We all remember that the city of Pompeii was destroyed by Mount Vesuvius in AD 79. This volcano is part of a string of seven active volcanoes, of which Mt. Etna in Sicily erupted in late February 2017.

Terrorist Attacks

A terrorist attack during the first week of June 2014 left the entire country of Yemen in darkness. Almost 150,000 were affected. The previous October, the Knights Templar, a splinter group from Mexico's Michoacan drug cartel, brought down the power grid in the State of Michoacan (southwestern Mexico). In all, nine substations were attacked and over 400,000 residents were without electricity. In 2015, Pakistan was plunged into darkness as terrorist attacks left over 14,000,000 without power.

In Conclusion

From these examples, it should be quite clear that the wonders of our power grid which allows everything to run off of electricity can end with not even a moment's notice. For that reason, you need to ask yourself this very important question: How will you prepare BeforeTheGridGoesDown(.com)?

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