

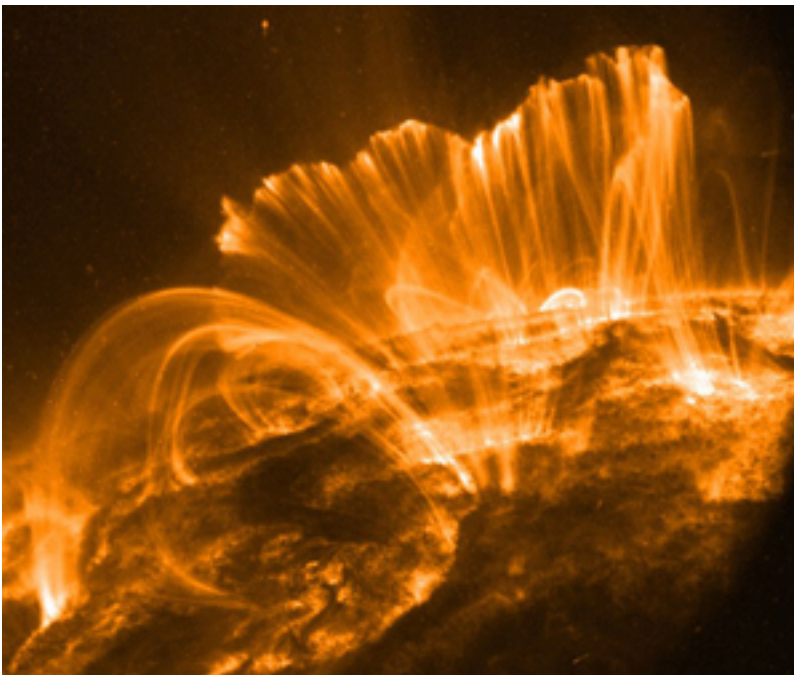


"Space Storms" Cloud Global Security

-- UK Parliament Holds Summit to Address International Threats --

written by: PJ Wilcox, 20-May-12

- Space weather can wreak havoc with international scope
- Grid breakdowns caused by space storms — or man-made electromagnetic pulse (EMP) weapons — pose epic threats
- Iran, North Korea and China believed to be testing EMP weapons
- *Anti*-pulse defense shields protect against nuclear EMP, missile and cyber attacks



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Countries that border the Arctic Ocean have been racing to claim the surrounding seafloor for its natural resources, as though there were a modern day gold rush. The true Midas touch, however, may belong to those looking up rather than down — nations staking out golden, unclaimed territory in space. The attention is not about

planting another flagpole on the moon or distant planet. At issue is "space weather." A couple of sentences in a 100-page report published in February 2012 by the British House of Commons Defence Committee put it succinctly: "We are pleased to note the recent intensification of efforts to forecast space weather. Its effects will not respect national boundaries..." (Note "not".)

Prime Minister Cameron took space steps forward with President Obama last year, announcing efforts to enhance collaboration on "actionable space weather information" including adding a 24/7 space-weather forecast office. Does that mean that some day, instead of plugging in a postal code to check a local forecast, they'll be an option to plug in "space"? It is a reality closer than one might imagine, and here's why: technology — and the national security of many western countries — relies to a high degree on space, including satellites, and space is subject to severe storms. Think of a hurricane causing massive electrical outages like Katrina in New Orleans, then multiply that impact perhaps a thousand-fold if the colossal weather event were to occur in space. A fierce solar storm could cause satellites to malfunction, put GPS out of use, create a cyber meltdown, and short circuit power grids and water pumping-stations to name just a few repercussions.

The National Academy of Sciences in the U.S. estimates that a magnetic storm today, were it to have the intensity like one that occurred in 1921, would force 130 million Americans into the darkness; a minor solar storm caused a grid collapse in Quebec in 1989, affecting 6 million people. Were the worst to happen, food supply chains could easily dry up within two months, and it could take months or years to restore key infrastructure.

So what exactly is "space weather," and why has the public heard so little about it? Space weather involves disturbances in magnetic forces surrounding the earth's atmosphere. Think of the Northern Lights, or aurora borealis, seen from countries like Norway or Canada. Beautiful to behold, the phenomena is created by electronically charged particles magnified by disturbances in the ionosphere. Dr. Lowell L. Wood, an astrophysicist, described such electromagnetic disturbances — which can also be man-made — as like "severe static electricity." The static electricity can occur in the form of an intense solar storm.

Little has been written about space weather in the past because high-altitude storms didn't much matter three decades ago. Communications satellites were far and few between, GPS was in its infancy, and the word "cyber-security" did not exist. What a difference a few decades makes. As the House of Commons pointed out in its report, "the potential effects of space weather are growing rapidly in proportion to our dependence on technology." Solar storms are also increasing in propensity and greater activity is anticipated over the next five years.

The UK Parliament gathered experts from around world in London last week for an "Electrical Infrastructure Security Summit" to address global risks. Among the

speakers is Dr. Peter Vincent Pry, a former CIA officer and expert on electromagnetic disturbances. Pry recently formed a congressional advisory board, the Task Force on National and Homeland Security, to address electromagnetic risks and advise on U.S. defenses against them. He likens an enormous geomagnetic storm to a "high-yield thermonuclear weapon detonated at high-altitude over the geographic center of the United States." Like a nuclear weapon, Pry worries about possible large-scale loss of life caused by solar storms due to power outages and the resulting domino effect on countless inter-connected industries. Pry is urging the U.S. Congress to quickly enact legislation to protect its population via a "GRID" or "SHIELD" Act; the latter has been introduced into Congress, while the former is in discussion. Either act does the job, in Pry's opinion.

Under the SHIELD Act, for example, the Federal Energy Regulatory Commission (FERC) would require operators to protect bulk-power systems against geomagnetic storms or EMP attacks and ensure their ability to promptly restore operations following such events. Related technical expertise would be developed within the government, and that expertise would be shared with operators. The act would also enable FERC to take emergency measures when faced with an imminent grid security threat and coordinate those measures with Canada and Mexico.

Regarding such cooperation, international ripple effects were noted in the British report as well: "Space weather is a global threat and may affect regions and countries simultaneously. This means that there is scope for mutual assistance, but also that there is no safe place from which it can be assumed that help will come."

Without legislation, some experts don't expect grid operators to act aggressively on their own. Electric companies in the U.S., for instance, are trying to block government oversight. They don't want to spend the funds needed for hardware protection against solar storms (costs are estimated at about 20 cents per year per electric ratepayer), and utilities won't release incident-data on transformer failures related to such storms. Regarding the latter, Thomas Popik doesn't understand why. Popik is Chairman of the Foundation for Resilient Societies, a non-profit advocate of protecting critical U.S. infrastructure. "Every airliner crash is independently investigated using black-box recorders," said Popik. "We should demand no less for critical infrastructure such as high voltage transformers, upon which our entire society depends."

The controversy doesn't end with stubborn utilities believing they can withstand the wrath of Mother Nature. If solar storms don't hail on the free world, their man-made equivalents might, i.e. electromagnetic pulse weapons (EMPs). Simply put, EMPs are radio-frequency shockwaves that render items or magnetic fields powerless, zapping them of energy. Electromagnetic pulse weapons act like huge circuit breakers, jamming anything electronic in their radius so that nothing works. Military communications go down, airplanes can't fly, grids fail, and computers, cars, TVs

and even refrigerators get fried. Modern society comes to a screeching halt.

When deployed from altitude — like space or a high-altitude missile — such a pulse could rain down over a wide swath of country, and in fact, some missile tests by Iran and North Korea are believed aimed at delivering EMPs. China is also known to have EMP weapons, though it draws less alarm from the west since China has too much economically at risk to start a “pulse war.” Russia acknowledged having EMP weapons a number of years ago.

Whether a natural or man-made EMP, neither respects sovereign boundaries. The key to any electromagnetic defense strategy is therefore to protect against all hazards, i.e. natural, nuclear, radio frequency and cyber. “The hardest thing to defend against is nuclear,” says Dr. Pry. “Utilities are going to want to do the minimum possible, maybe get security guards or put their parking lot across the street to protect against radio-frequency weapons. But that leaves everything vulnerable to a natural or nuclear EMPs.”

While talk of EMP terrorism can be startling, there remains reassuring news. Long before rogue states began testing their zap-ability, the U.S. had already controlled space, and together with Israel, had developed highly sophisticated EMPs that serve as protective “shields.” Such space defense was a vision long in the making beginning with satellite launches in the late '50s. By 1999, the burgeoning frontier of space defense had so developed that it prompted General Richard B. Myers, Commander in Chief, United States Space Command, to say, “It’s clear that no credible vision for national security...can ignore the opportunities or the risks associated with exploiting space.”

Satellites are integral to space, and in turn, to operating anti-pulse shields; think of the Space Invaders game where laser guns shoot down enemies invading spatial territory. Likewise, electromagnetic shockwaves, or shields, can destroy rogue weapons aimed to wreak havoc. Israel, for example, is believed to employ some version of an anti-pulse shield that obliterates incoming rockets before they can annihilate the country. In the past year, according to an intelligence source, an astounding 384 enemy rockets launched toward Israel failed to reach it. At that rate, it is surprising adversaries keep trying. Japan is also said to have “borrowed” related technology for aggressive self-defense, and Australia is equipped, among others.

Some rogue states, however, remain bent on destruction and their missile tests and satellite efforts continue. So for now, the local forecast in space remains “cloudy” until additional measures are taken by the free world to protect power grids and guard against EMP threats. As those measures proceed, the forecast is for clearing skies.