

# Ready for the One-Year Blackout?

## Protecting America Against "Permanent Continental Shutdown" From Electro-Magnetic Pulse Events



photo: composite of SOHO (ESA & NASA) + other art

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InfraGard National  
Electromagnetic Pulse Special Interest  
Group

Chuck Manto

Geomagnetic Disturbance Workshop  
*Center for Advanced Energy Studies*  
*995 University Blvd, Idaho Falls, Idaho*

**Tuesday, April 7, 2015**



# Outline – Engaging Financial Support for New Markets & R&D

- Intro to InfraGard National EMP SIG
- News and controversies over public discussions
- Support for research and protection measures
- Federal vs state legislation
  - Planning for emergency management
- InfraGard National EMP SIG activities new since last meeting?
  - Table top exercises
  - Regional EMP SIGs
  - Annual conferences, publications and collaborations
  - Neutral turf for confidential collaboration

# National InfraGard EMP SIG

- InfraGard – FBI’s public private info-sharing partnership -- 501 (c)3 of individuals
- EMP SIG first nationwide comprehensive critical infrastructure organization to focus on EMP
- Covers **all** high-impact low-frequency events that would cripple national infrastructure for > month
- Supports events, e.g. NDU, DuPont Summit, August 8 EMP SIG JHUAPL meeting , Space Weather Workshop
- Provides panels of top experts to assist local InfraGard chapters and communities

# InfraGard National EMP SIG Guidance Document

- **All hazards approach (“Every Major Problem SIG”)**

The purpose of the InfraGard National EMP (electromagnetic pulse) SIG (special interest group) is to address and mitigate the threat of a simultaneous nationwide collapse of infrastructure from any hazard such as manmade or natural EMP, that could cause a similar collapse of infrastructure over most or all of the US is also of interest to the EMP SIG.

- **Method focusing on local sustainability**

The National EMP SIG will mobilize resources at the national level so that local InfraGard chapters and local EMP SIGs can make use of them to help local communities become more sustainable in light of these threats.

- **Expert national advisory and liaison panels:**

The National EMP SIG will recruit boards or panels of leading advisors in various subject matter covering specific threats (such as EMP and extreme space weather), all impacted critical infrastructures, and critical relationships and communications between stakeholders. *See EMP SIG Guidance Doc.*

# Spectrum of Recovery

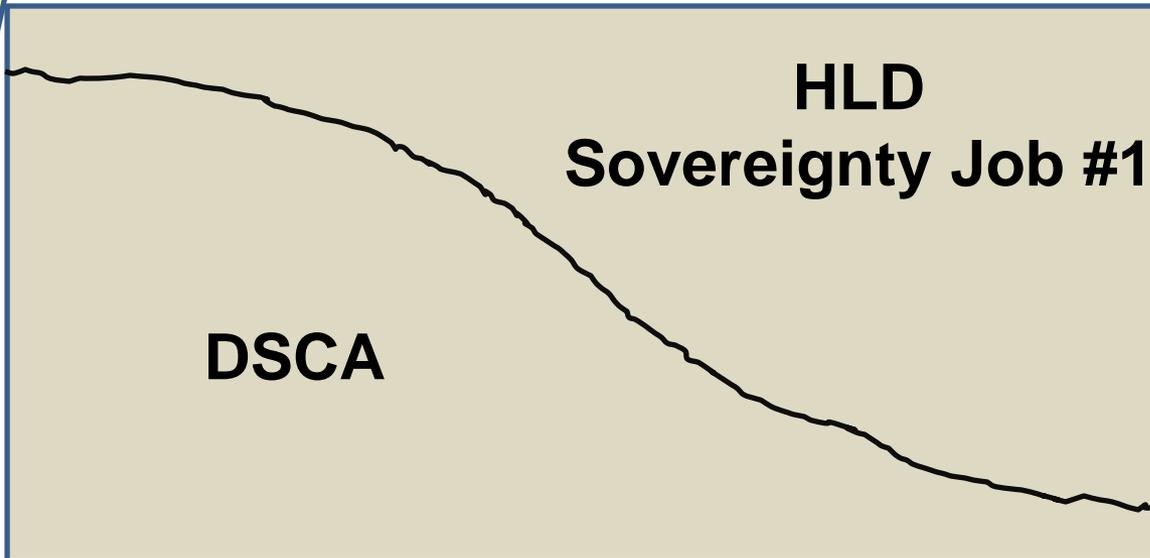
US Army War College Seminar Sep 28-30, 2010  
Long Term Civilian Infrastructure Failure, e.g. EMP

Disaster over 2  
Federal Regions  
(mostly  
reversible)

Irreversible  
Recovery:  
“New Governance” /  
“New Normalcy”



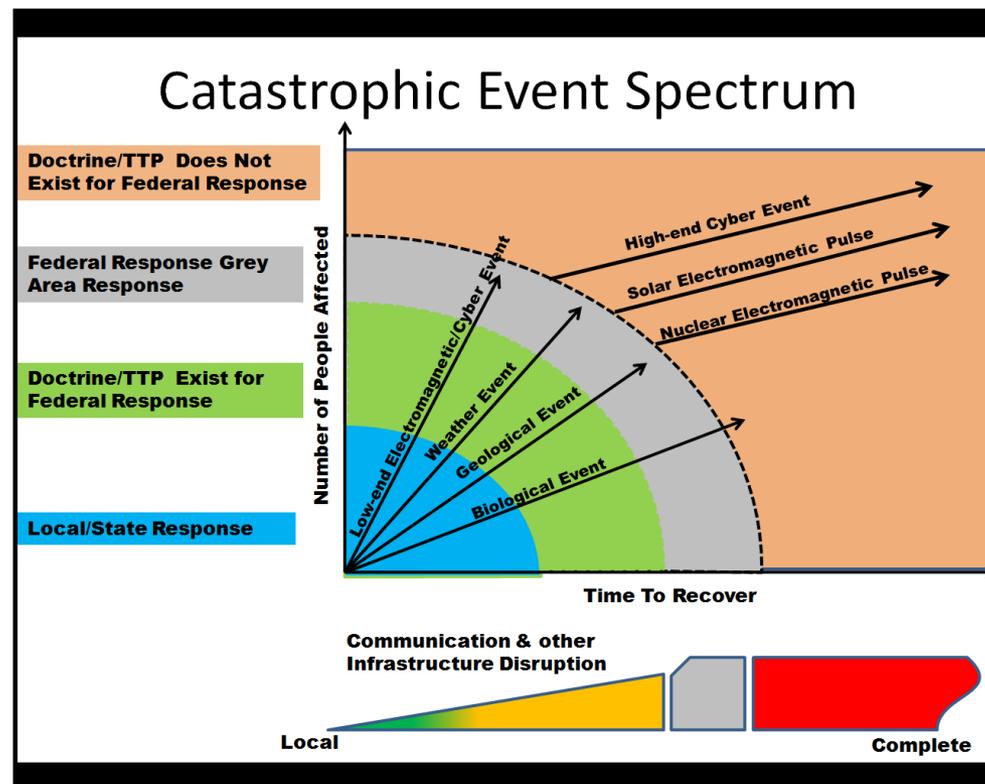
What are the  
events/effects  
that define  
these  
conditions?  
What are the  
expectations  
of individuals  
to support?



# The Big Disasters We Ignore

Chart by Colonel Caton, US Army War College reviewing “In The Dark: Military Planning for a Catastrophic Critical Infrastructure Event” held 28-30 September 2010.

- Largest area and longest duration disasters ignored



# Resilience -- Why Bother?

- Major disasters wont happen to me
- If they do, it won't be anytime soon
- If disaster happens, some specialists are doing their jobs to protect me (I'm helpless)
- If we get hurt, someone will rescue me (someone else' s job)
- Too depressing to think about
- Results in less resilience & support for help

# Benefits to HILF Planning

- Demonstrates why all need to be engaged
- Develops local sustainability
  - Local power and storage
  - Local food, etc.
- Develops greater local relationships

# That was a close one! Study: Massive solar storm barely missed us in 2012

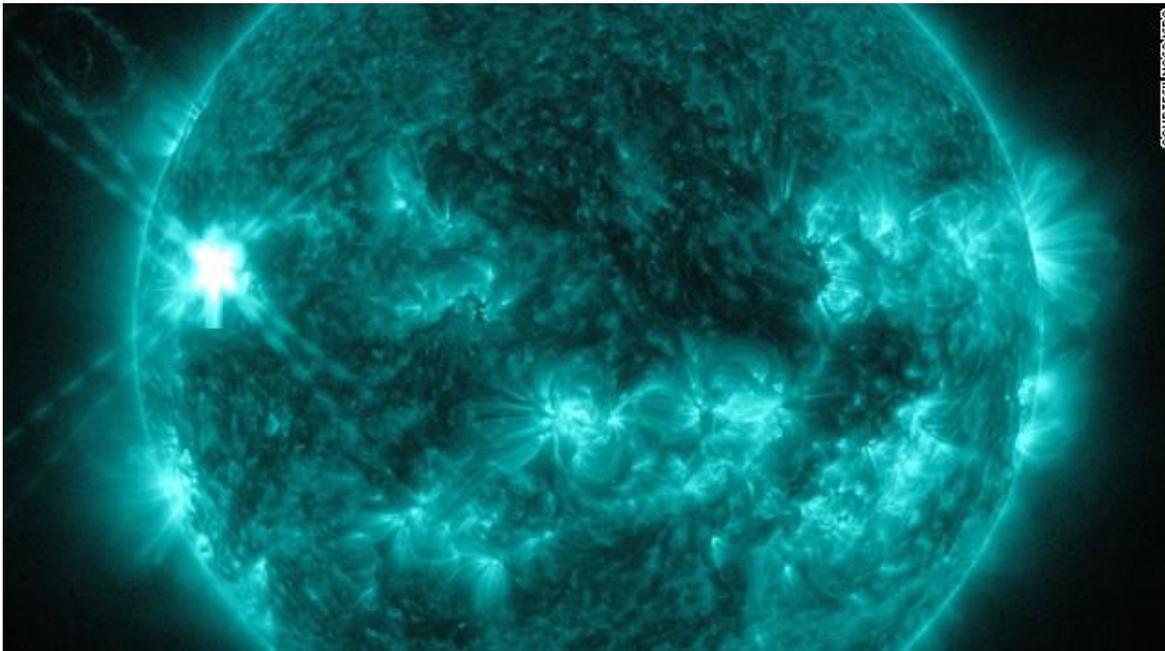
By **Carter Maguire**, CNN

updated 4:16 PM EDT, Fri July 25, 2014

**(CNN)** -- "Here comes the sun" indeed, and it was just barely all right.

Two years ago, modern infrastructure came very close to a serious disruption. The culprit? One of the largest solar storms in recorded history.

Plasma exploding from the surface of the sun in a coronal mass ejection barreled through space and crossed through Earth's orbital path on July 23, 2012.



If the flare had erupted about one week earlier, Earth would have been squarely in the line of fire, [Daniel N. Baker wrote in a study published in the journal Space Weather.](#) (Baker is with the Laboratory for Atmospheric and Space Physics at the [University of Colorado](#)).

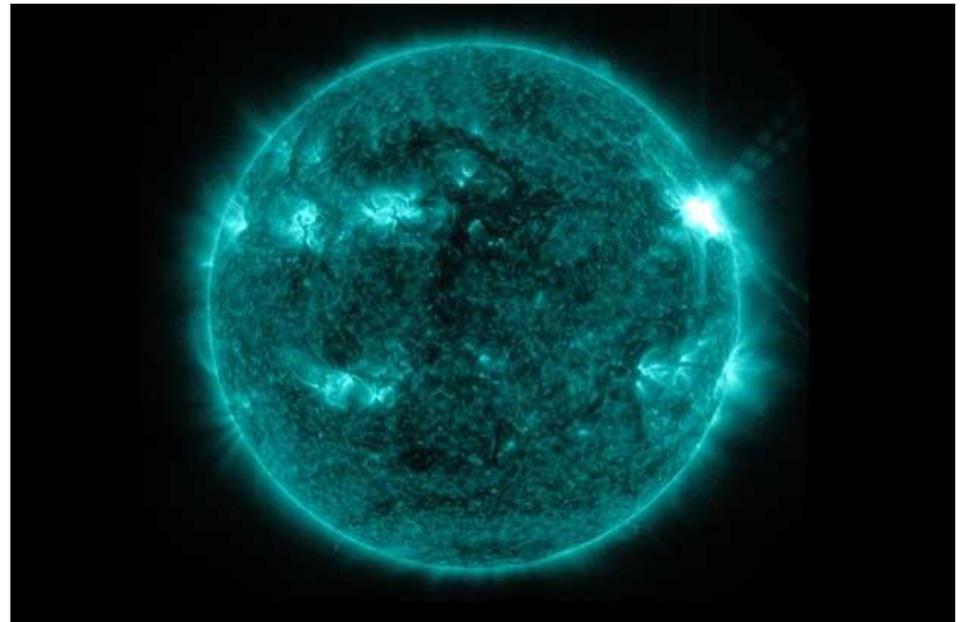
<http://www.usnews.com/news/articles/2013/06/06/study-new-york-dc-vulnerable-to-massive-solar-storms>

Study: New York, D.C. Vulnerable to Massive Solar Storms

**A large solar storm could knock power grids offline for months at a time**

By JASON KOEBLER, US News & World Report  
**June 6, 2013** RSS Feed

A massive solar storm could knock out power along the I-95 corridor between Washington, D.C. and New York City for months – if not longer – according to a new report by **British insurance market Lloyd's**.



# Coordinated Federal Space Weather Framework

- **Introduction to SWORM (Space Weather Operations, Research, and Mitigation Task Force)**
- Chair: William Murtagh, OSTP

# Physical Attack on Metcalfe Grid and Communications



## Shots in the Dark

A look at the April 16 attack on PG&E's Metcalf Transmission Substation

- |  |   |  |   |  |   |   |
|--|---|--|---|--|---|---|
| <p><b>1</b></p> <p><b>12:58 a.m., 1:07 a.m.</b><br/>Attackers cut telephone cables</p> | <p><b>2</b></p> <p><b>1:31 a.m.</b><br/>Attackers open fire on substation</p> | <p><b>3</b></p> <p><b>1:41 a.m.</b><br/>First 911 call from power plant operator</p> | <p><b>4</b></p> <p><b>1:45 a.m.</b><br/>Transformers all over the substation start crashing</p> | <p><b>5</b></p> <p><b>1:50 a.m.</b><br/>Attack ends and gunmen leave</p> | <p><b>6</b></p> <p><b>1:51 a.m.</b><br/>Police arrive but can't enter the locked substation</p> | <p><b>7</b></p> <p><b>3:15 a.m.</b><br/>Utility electrician arrives</p> |
|--|---|--|---|--|---|---|

Sources: PG&E; Santa Clara County Sheriff's Dept.; California Independent System Operator; California Public Utilities Commission; Google (image) The Wall Street Journal

U.S. NEWS Wall Street Journal Assault on California Power Station Raises Alarm on Potential for Terrorism

April Sniper Attack Knocked Out Substation, Raises Concern for Country's Power Grid

By REBECCA SMITH

Feb. 18, 2014 3:50 p.m.

[. http://online.wsj.com/home-pageUpdated](http://online.wsj.com/home-pageUpdated)

# How to Share Info?

[http://www.washingtonpost.com/politics/federal\\_government/report-on-power-grid-threats-mishandled/2014/04/09/cbee5186-c031-11e3-9ee7-02c1e10a03f0\\_story.html](http://www.washingtonpost.com/politics/federal_government/report-on-power-grid-threats-mishandled/2014/04/09/cbee5186-c031-11e3-9ee7-02c1e10a03f0_story.html)

- **Gov't says report on power grid threats mishandled**
  - By Associated Press, Published: April 9
  - WASHINGTON — Federal energy regulators improperly allowed widespread access to a sensitive document that outlined specific locations where the nation's electric grid is vulnerable to physical threats, a government investigator said Wednesday.
  - The document created by the Federal Energy Regulatory Commission should have been kept secret as a national security matter, Energy Department Inspector General Gregory Friedman said. Instead the information was provided in whole or in part to federal and industry officials **in uncontrolled settings.**

# Disclosure Challenged *not Info*

AP April 9, 2014, cont'd

- A March 13 story in the Wall Street Journal said federal officials had concluded that coordinated attacks in each of the nation's three separate electric systems could cause the entire power network to collapse. **Knocking out nine key substations could plunge the country into darkness for weeks, if not months, the newspaper said, citing the federal analysis.**
- Sens. Mary Landrieu and Lisa Murkowski, the top two leaders of the Senate Energy Committee, asked Friedman to investigate the “apparent leak” to the newspaper.
- Murkowski, R-Alaska, called release of the information dangerous and irresponsible and said it “could provide a road map to those who wish to harm the United States.”

# Discussion ?s – How to Share Info

- How to share understanding of the threats and requisite prep?
  - Supply chain integration (vertical and horizontal)
  - Customer collaboration
  - Trusted communications and collaboration
- **How to use InfraGard as only large scalable system for info sharing available across sectors?**
- How to plan and prepare with scarce resources?
- Use of emergency management planning

# “Critical Infrastructure Protection Act” or the “CIPA”

114TH CONGRESS 1ST SESSION H. R. 1073

To amend the Homeland Security Act of 2002 to secure critical infrastructure against electromagnetic threats, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 25, 2015

# “Critical Infrastructure Protection Act” or the “CIPA”

- Mr. FRANKS of Arizona (for himself and Mr. SESSIONS) introduced the following bill; which was referred to the Committee on Homeland Security
- A BILL To amend the Homeland Security Act of 2002 to secure critical infrastructure against electromagnetic threats, and for other purposes.

# [Virginia S 1238]

Approved March 10, 2015

- **CHAPTER 97**
- *An Act to amend and reenact § 44-146.18 of the Code of Virginia, relating to Department of Emergency Management; electromagnetic pulses and geomagnetic disturbances.*
- [S 1238]
- Approved March 10, 2015

# [Virginia S 1238]

Approved March 10, 2015

- **44-146.18.** *Department of Emergency Management shall ensure that all such plans, assessments, and programs required by this subsection include specific preparedness for, and response to, disasters resulting from electromagnetic pulses and geomagnetic disturbances.*
- *<http://lis.virginia.gov/cgi-bin/legp604.exe?151+ful+CHAP0097>*



# **Severe Space Weather Threats National Electrical Grid and Impacts to Critical Infrastructures**

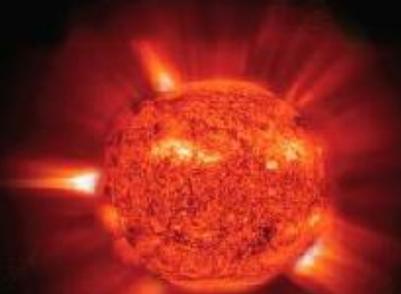
A Roundtable Exercise  
Hosted by National Defense University  
In Conjunction with the US Congressional EMP Caucus

## **AFTER ACTION REPORT**

October 3, 2011

# High-Impact Threats to Critical Infrastructure

EMERGING POLICY AND TECHNOLOGY



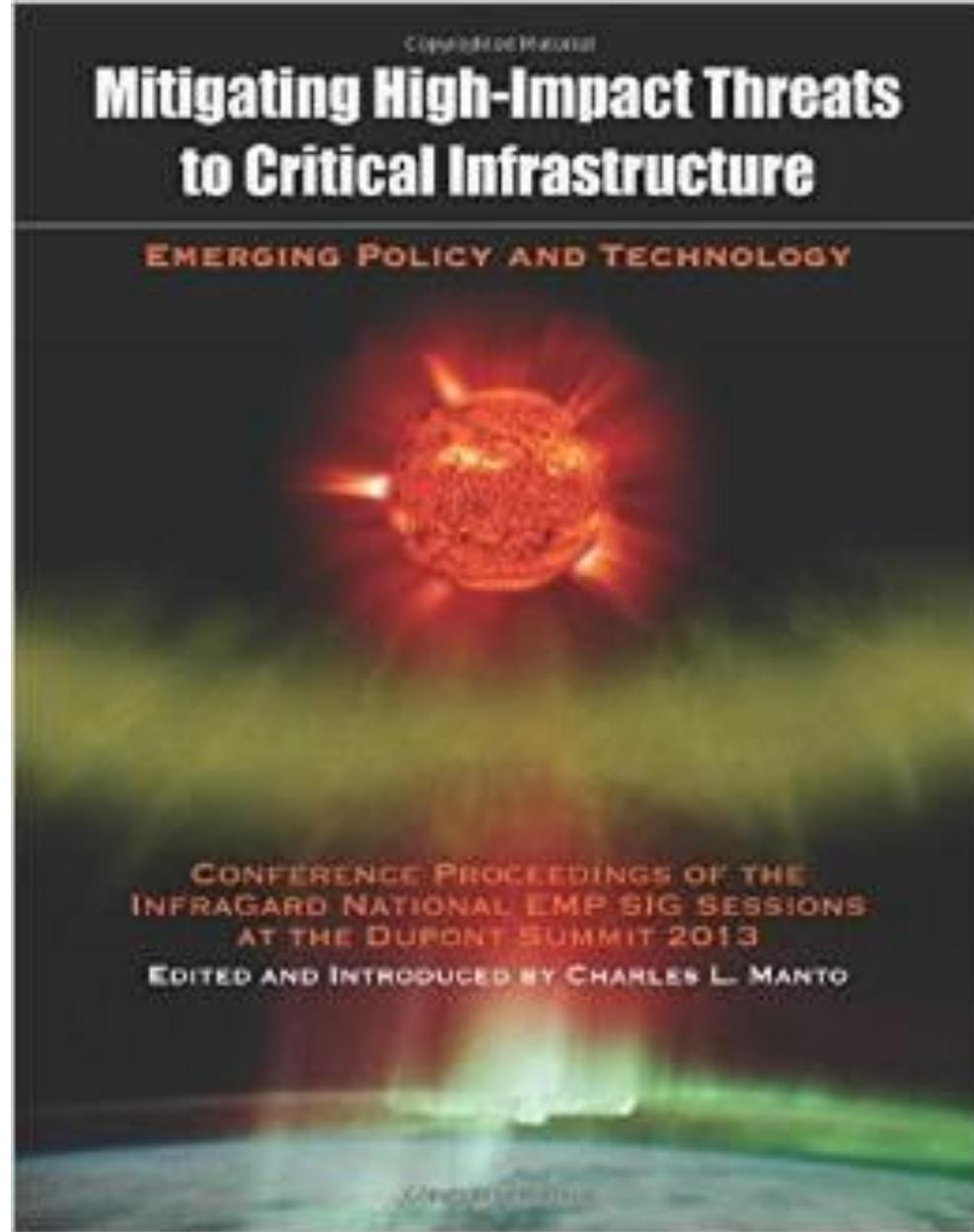
CONFERENCE PROCEEDINGS OF THE  
INFRAGARD NATIONAL EMP SIG SESSIONS  
AT THE DUPONT SUMMIT 2012

EDITED AND INTRODUCED BY CHARLES L. MANTO

Presentations, papers and other resources by policy and technology leaders co-sponsored by the Policy Studies Organization and InfraGard National on the first Friday of December.

Proceedings in print and Kindle versions.

Proceedings includes videos and transcripts of presentations including appendix with 79 hyper-linked references.



# EMP SIG ((•))

ElectroMagnetic Pulse Special Interest Group

The EMP SIG addresses any high-impact threat that could cause long-term nationwide collapse of critical infrastructure. These threats include EMP, extreme space weather, cyber attacks, coordinated physical attacks or widespread pandemics. The EMP SIG provides trusted communications and information for InfraGard members active in any critical infrastructure in any community to enhance planning, mitigation, and sustainable infrastructure. The EMP SIG attracts leading subject matter experts who have agreed to join advisory panels and make themselves available for local InfraGard chapters that may need their special guidance.

The ultimate goal of the national EMP SIG is to assist local communities to enhance their own sustainability with a special emphasis on developing local infrastructure capacity from areas as diverse as local power generation and storage to local food production.

InfraGard's EMP SIG plans to continue its role in fostering public/private cooperation in a comprehensive "all-of-nation" approach to disaster mitigation and planning. InfraGard members may join the EMP SIG on the InfraGard secure website. To join InfraGard and have access to the secure site, apply on the homepage of [www.InfraGard.org](http://www.InfraGard.org).

The first time that a broad range of military and civilian government agencies and their private sector counterparts led contingency plans for nationwide collapse of critical infrastructure that could last for more than a month was in October 2011 when the National Defense University, the US Congressional EMP Caucus, InfraGard National's EMP SIG and Maryland's Emergency Management Agency co-hosted a series of workshops and exercises covering these scenarios focusing on geomagnetic disturbances. In the following December, eight of those participants provided an overview of the results and ramifications of those meetings at the Dupont Summit 2011 hosted by the Policy Studies Organization.

One year later, the Dupont Summit 2012 hosted sessions by InfraGard National's EMP SIG that updated activities from the prior year ranging from FERC's notice of a proposed rule making on GMD protection to the new FBI i-Guardian cyber protection program.

These conference proceedings include links to updated on-line exhibits and uploaded videos provide presentations by technology and policy leaders on the most serious threats to technology-based society most likely to be experienced in our life times.

For upcoming events and more information see the EMP SIG section of the National InfraGard secure website or contact the EMP SIG Chair, Chuck Manto, at [cmanto@stop-EMP.com](mailto:cmanto@stop-EMP.com).



\$19.95 USD



Back cover of “High Impact Threats” describes the all-hazards role of InfraGard’s EMP SIG and its national advisors who support local communities across the nation.



**High Impact Threats to the Electrical Grid**  
Workshop & Tabletop Exercise

**EMP SIG** ((•))  
Education. Communication. Power. Resilience.

# Roll Out of TTX Nationwide

- Regional EMP SIGs
- Next workshops and TTXs in NY, IL, NC
- Universities (e.g., Norwich, Naval Post Grad)
- NGA, National Guard Bureau, Northcom, NACO

# Norwich “DC Week” Capstone Event



## National Security Strategic Simulation (working draft)

*“High Impact Threats to the Electric Grid”*

# Potential This Year– Your Role

- Advisory panels to foster action on next steps
  - Cross sector action
  - Facilitate national interaction
- What do you want to accomplish?
- Dupont Summit 1<sup>st</sup> Friday in Dec
  - Showcase best practices of utility industry
  - Publish perspectives on gaps
  - Update engagement (e.g. TTXs, regional groups)

# InfraGard EMP SIG Dupont Summit

## [Congressman Roscoe Bartlett - House Resolution 762 Engaging the ...](#)



[www.youtube.com/watch?v=w5j5M0y3w6s](http://www.youtube.com/watch?v=w5j5M0y3w6s)

Feb 7, 2013 - Uploaded by PSO73

**Dupont** Summit 2012 on Science, Technology, and Environmental Policy Issues Policy Studies Organization ...

## [Assistant Secretary of Defense Dr. Paul Stockton - High-impact Disast...](#)



[www.youtube.com/watch?v=-G6sBiDk1W8](http://www.youtube.com/watch?v=-G6sBiDk1W8)

Feb 8, 2013 - Uploaded by PSO73

**Dupont** Summit 2012 on Science, Technology, and Environmental Policy, ... Policy Studies Organization ...

## [Honorable James Woolsey - Energy and National Security: Protecting...](#)



[www.youtube.com/watch?v=Ax\\_QWHbnWPE](http://www.youtube.com/watch?v=Ax_QWHbnWPE)

Feb 9, 2013 - Uploaded by PSO73

**Dupont** Summit 2012 on Science, Technology, and Environmental Policy, ... Policy Studies Organization ...

## [Dr Peter Vincent Pry -- EMP Action, Too Little Too Late? -- - YouTube](#)



[www.youtube.com/watch?v=gl-HXjYwov0](http://www.youtube.com/watch?v=gl-HXjYwov0)

Feb 7, 2013 - Uploaded by PSO73

**Dupont** Summit 2012 on Science, Technology, and Environmental Policy Issues Policy Studies Organization ...

#### 4. Latest Idaho National Laboratory Research Data on GMD Impacts to Power Grid Infrastructure

Mr. Scott McBride, National and Homeland Security, Critical Infrastructure Protection & Resilience, Idaho National Laboratory



## 5. Updates on Space Weather Threats for Power and Communications

Mr. William Murtagh, Program Coordinator, National Oceanic and Atmospheric Administration/National Weather Service Space Weather Prediction Center



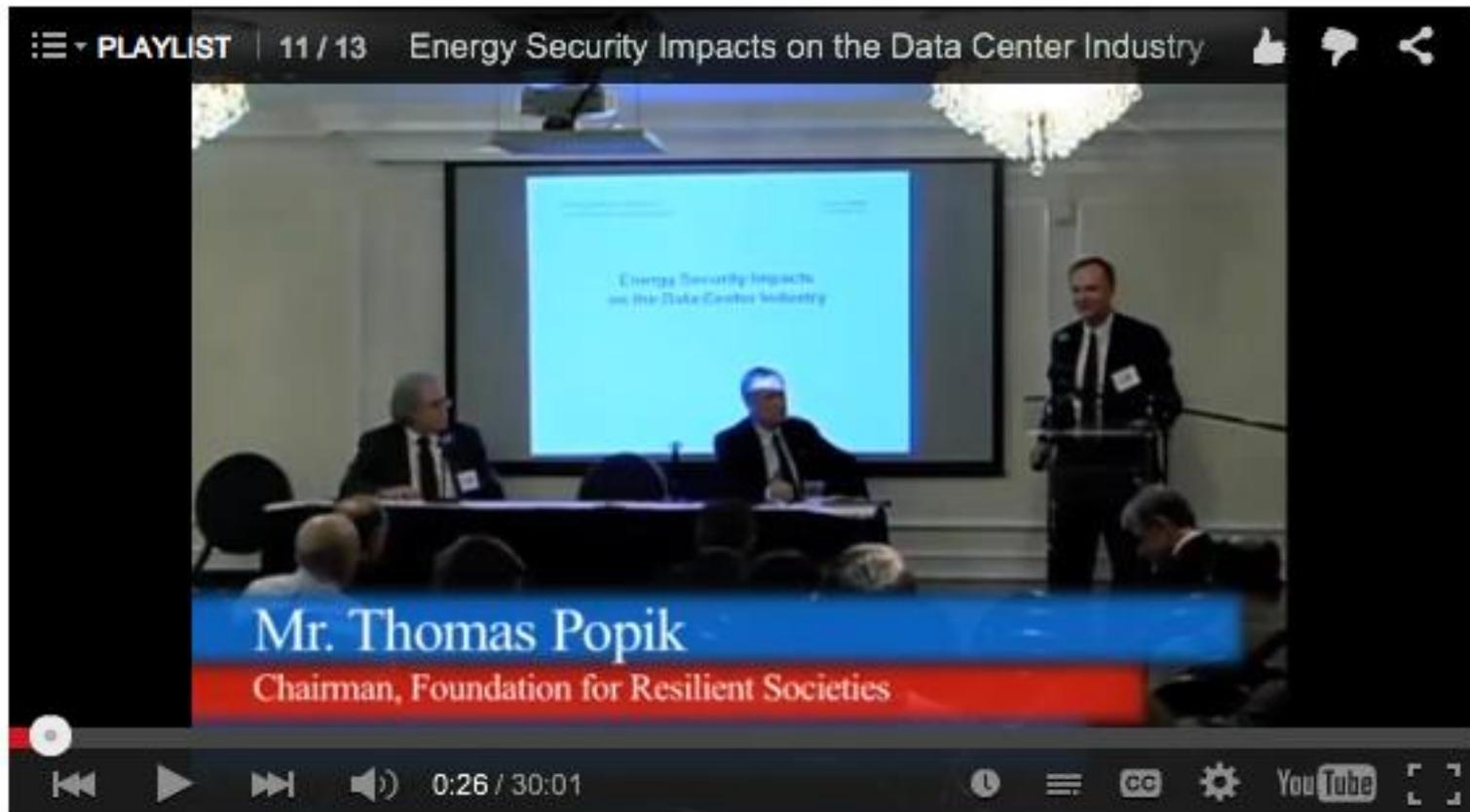
The image shows a YouTube video player interface. At the top, the video title is "Updates on Space Weather Threats for Power and Com". The video content shows a man in a suit, Mr. William Murtagh, standing next to a large projection screen. The screen displays a presentation slide with the following text: "Space Weather Update", "Bill Murtagh", "NOAA Space Weather Prediction Center", "Boulder, Colorado". Below the video, a blue banner identifies the speaker as "Mr. William Murtagh" and a red banner identifies his affiliation as "National Weather Service Space Weather Prediction Center". The video player controls at the bottom show a progress bar at 0:29 / 24:10 and the YouTube logo.

## 11. Energy Security Impacts on the Data Center Industry

Mr. Thomas Popik, Chairman, Foundation for Resilient Societies

Mr. Michael Caruso, ETS-Lindgren

Dr. George Baker, Professor Emeritus, James Madison University

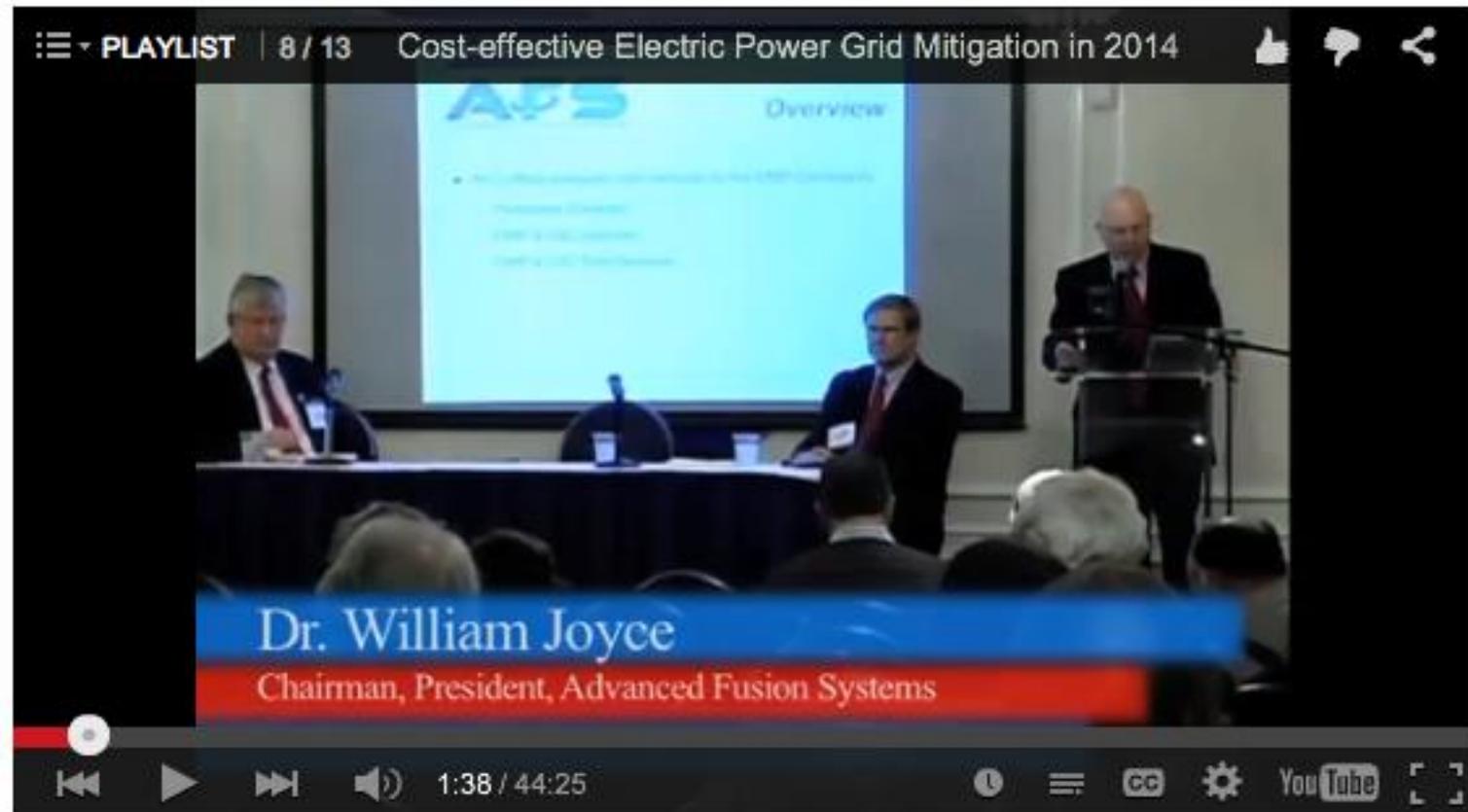


## 8. Cost-Effective Electric Power Grid Mitigation in 2014

Mr. George Anderson, Founder and Chairman of the Board, Emprimus

Dr. William Joyce, Chairman, President, Advanced Fusion Systems

Mr. Gale Nordling, President and CEO, Emprimus



### 3. The FBI, DHS, DoD and the National Governors Association Public/Private Plans to Mitigate Cyber Threats against CI

Dr. Frank Kesterman, Professor of Homeland Security and Cyber Security, University of Maryland University College

Mr. Thomas MacLellan, Director, Homeland Security and Public Safety Division, National Governors Association

Mr. Trent Teyema, FBI Washington Field Office, Assistant Special Agent in Charge

Mr. William O. (Bill) Waddell, Director, Mission Command and Cyberspace Group, Center for Strategic Leadership and Development, US Army War College

Mr. Robin Montana Williams, CWDP, Chief, National Cybersecurity Education and Awareness Branch, Department of Homeland Security



## 12. Maine Legislation on Power Grid Protection from Manmade and Natural EMP

Maine State Representative Andrea Boland



“A HEMP attack now would take our ability to support a population back 100 years” ... Congressional testimony.



# Thank You

For more information contact:

Chuck Manto, President

Instant Access Networks, LLC

Email: [cmanto@stop-EMP.com](mailto:cmanto@stop-EMP.com)

Phone: (410) 991-1469

# EMP Planning in NFPA 1600

## Disaster/Emergency Management & Business COOP Includes EMP Plans and Mitigation

- CH 1 Business COOP, public & private
- CH 5 Comprehensive program elements
  - 5.3.2 Hazards to be evaluated:
    - Natural (including geomagnetic storms in #1b ix)
    - Human caused (accidental and intentional)
      - Includes EMP in #2b.ix
    - Technological-caused events
  - 5.3.3 Entity shall conduct an impact analysis
    - Health and safety
    - COOP
    - Economic
- See <http://www.nfpa.org/assets/files//PDF/CodesStandards/1600-2007.pdf>
- Work with public safety and local government groups (PTI) to implement

# FIPS, NIST SP 800-53 Trigger

- **“A newly identified, credible, information system-related threat to organizational operations and assets, individuals, other organizations, or the Nation is identified based on intelligence information, law enforcement information, or other credible sources of information”**
- **“Triggers the immediate need to assess the security state of the information system and if required, modify or update the current security controls” (Sec 3.4, pp. 27-28)**

# Change Challenge

- How to approach existential threats
- Awareness (Massive marketing)
  - Change major key organizations
  - Influence thinking of 100's of Ms
- Policy (Creating new law, policy, reg's)
- Technology (Innovation process)
- Preparation, planning, mitigation
- Where to start (Before \$ available)

# EMP SIG Milestones

- Formed in summer of 2011, in all 50 states
- Supported national workshops and exercise in Oct 2011 (first high-impact scenarios -- NDU)
- Led Dupont Policy Summit seminar Dec 2011
- Emailed invitation to IG membership  
Christmas 2011 w website/listserv support
- Received 1000 members by summer 2012
- Published official flier summer 2012
- “Inspired” congressional resolution Aug 2012

# EMP SIG Milestones

- Dupont Summit 2012 Conference
  - 300 live registrations
  - 200 webcast registrations
  - 24 Posted live videos (also on YouTube)  
<http://www.ipsonet.org/conferences/the-dupont-summit/dupont-summit-2012/infragard-emp-sig>
  - August conference proceedings
- Expanded advisory panels
- Briefings to government agencies and private sector
- Colorado venues April and July 2013
- Dupont Summit 2013 Dec 6

- ABB Incorporated
- American International Group, Incorporated
- Applied Materials
- Baxter International, Incorporated
- Boeing Company
- Caterpillar Incorporated
- Chevron
- Chrysler, LLP
- CIGNA International
- Deloitte & Touche, LLP
- Dewey & LeBoeuf LLP
- DHL North America
- E. I. du Pont de Nemours & Company
- Eastman Kodak Company
- Ernst & Young LLP
- ExxonMobil Corporation
- Fluor Corporation
- Ford Motor Company
- General Electric Company
- General Motors Corporation
- Halliburton Company
- Hanesbrands Inc.
- Hercules, USA
- Hewlett-Packard Company
- Ingersoll-Rand Company
- Johnson & Johnson
- JPMorgan Chase & Co
- KPMG, LLP
- KPMG, LLP
- Mars Incorporated
- Microsoft Corporation
- National Foreign Trade Council
- Occidental Petroleum Corporation
- Oracle Corporation
- PepsiCo, Inc.
- Pernod Ricard USA
- Pfizer Inc.
- PricewaterhouseCoopers LLP
- Procter & Gamble Company
- Prudential Insurance Company
- Ridgewood Group International
- Rockwell International Corporation
- Siemens Corporation
- Sullivan & Worcester LLP
- TE Connectivity
- Tyco Electronics
- United Technologies Corporation
- Wal-Mart Stores, Incorporated

# *Advancing Global Commerce for 95 Years*



## **NFTC Board Retreat**

**June 10, 2011 Cambridge, MD**

**Facing Emerging Threats to Global Commerce  
and the US Economy**



## **Solar Storm**

**By Charles L. Manto, CEO, Instant Access Networks, LLC**

**[www.stop-EMP.com](http://www.stop-EMP.com)**

## Opportunity for NFTC Members

A fascinating but sobering presentation at the NFTC's June Board meeting dealt with catastrophic solar storms and the devastating economic and other effects they are capable of having on electricity grids and equipment, industrial equipment and the like. Lesser geomagnetic storms occur regularly within human lifespans and truly catastrophic ones on somewhat longer schedules. A large scale event in 1859 was of limited impact because the then-existing electrical technology consisted of telegraph wires and equipment. An event of similar magnitude today would have a potential effect difficult to exaggerate.

The National Defense University and NORTHCOM are organizing a public-private sector planning exercise that will *“work through the implications of long-term infrastructure failure”* and discover ways to *“mitigate such a disaster, improve sustainability of communities and protect communications while enhancing energy and food security.”* This exercise affords NFTC members an unprecedented opportunity to be involved early in the planning process, to assure private sector input and to make government officials aware of the business implications of both a major solar storm and of proposed measures to mitigate its impact.

NFTC member companies that may wish to consider participation in the upcoming session or in future such meetings will find the [attached](#) letter from Chuck Manto and the other attachments (see URLs below) to be of particular interest.

- <http://www.nftc.org/default/2011Temp/Chuck Manto letter to NFTC.pdf>
- <http://www.nftc.org/default/2011Temp/NDU Secure Grid 11 letter.pdf>
- <http://www.nftc.org/default/2011Temp/Manto EMP SIG INMA Letter.pdf>
- <http://www.nftc.org/default/2011Temp/NERC NFPA JH NDU.pdf>

August-September 2011 Issue

Page 12

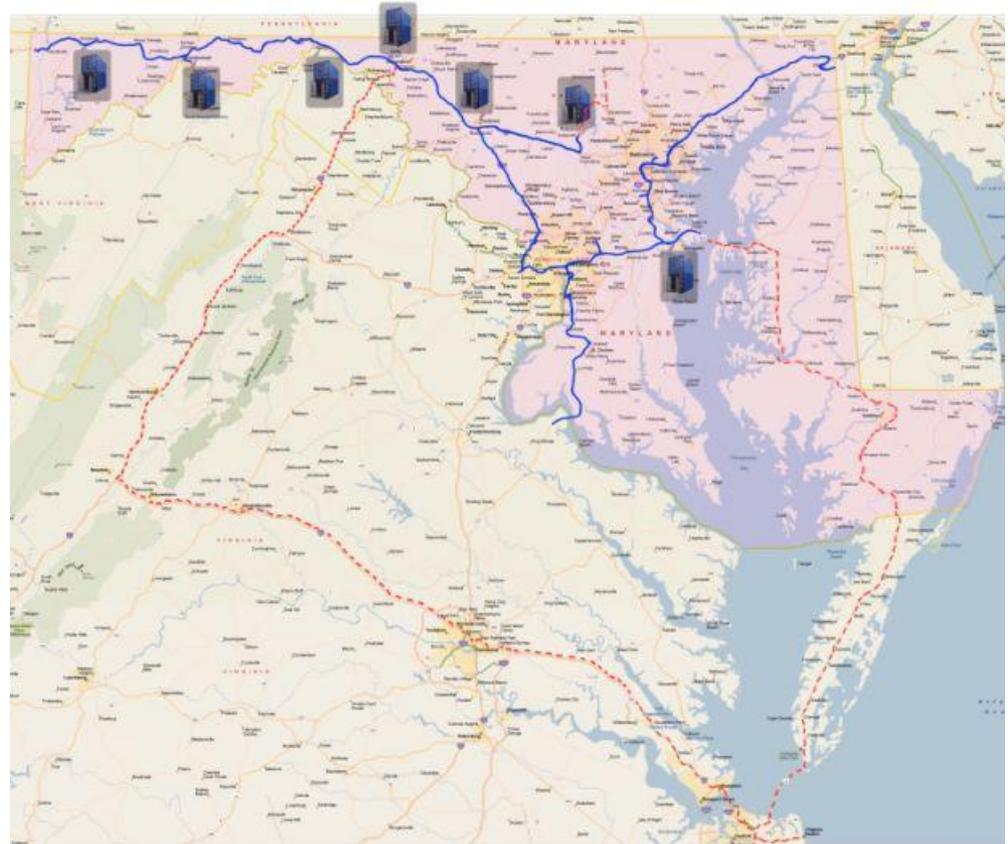
*2011 World Trade Dinner and Award Ceremony | October 5, 2011 | Organization of American States*

# Legal Issues

- PPD-8 and other executive orders
- FIPS 200 and FISMA (+ Supply Chain)
- Fire Codes (NFPA 1600) and NIST
- IEEE
- FERC and NRC
- Insurance issues
- Procurement regulations
- What's the cyber security ammendment?

# Networked Business Continuity Parks™

- No cash required:
  - Local governments
  - Hospitals
  - Universities
- Cash provided by private sector
- Leverages grants by strong local match



## Protect Critical Infrastructure

Renewable Energy:  
Wind, Solar, Next Generation  
Communications: Fiber Optic, 911 Centers  
Computing  
Water  
Food  
Medical  
Manufacturing  
Mobile Command  
All-Hazards  
Finance



EMP-Safe, Networked Business Continuity Parks™  
Turn-key, EMP-Safe Communities  
No Cash - In-Kind Match  
Private/Public Partnerships

— Phase One  
- - - Phase Two

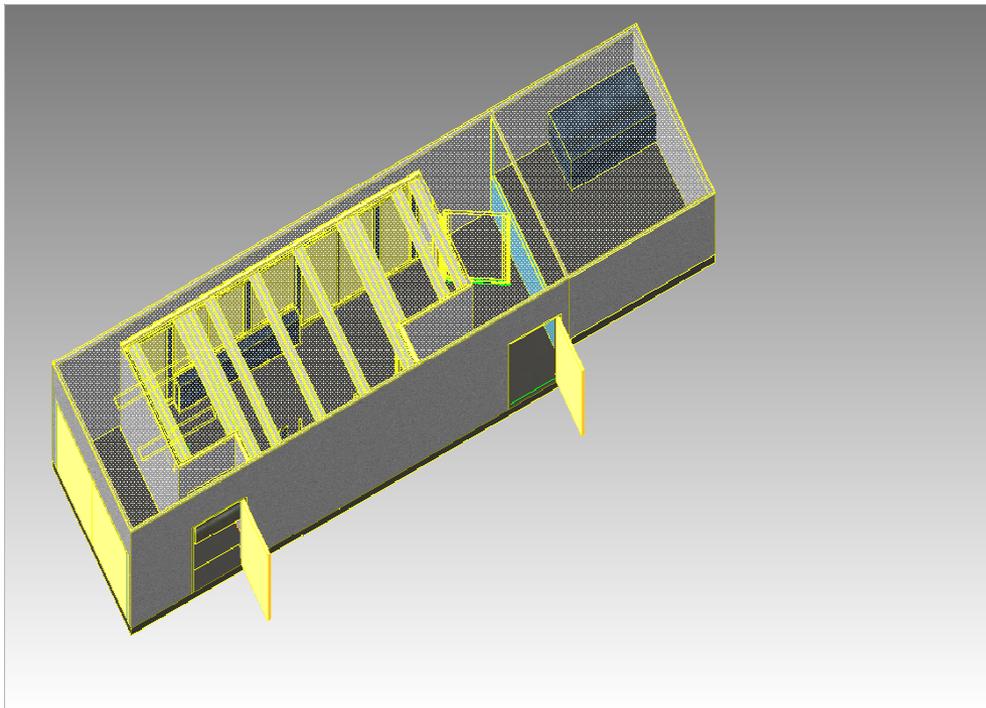


# EMP Safe Micro Grids, Fiber Nets



# Modular & Scalable Mitigation Strategies

## IAN's EMP Protected Mobile Command Center



# Modular Mitigation Strategies: 140dB 32' EMP Trailer and GMC Pickup (CGVW <26,000 lbs)

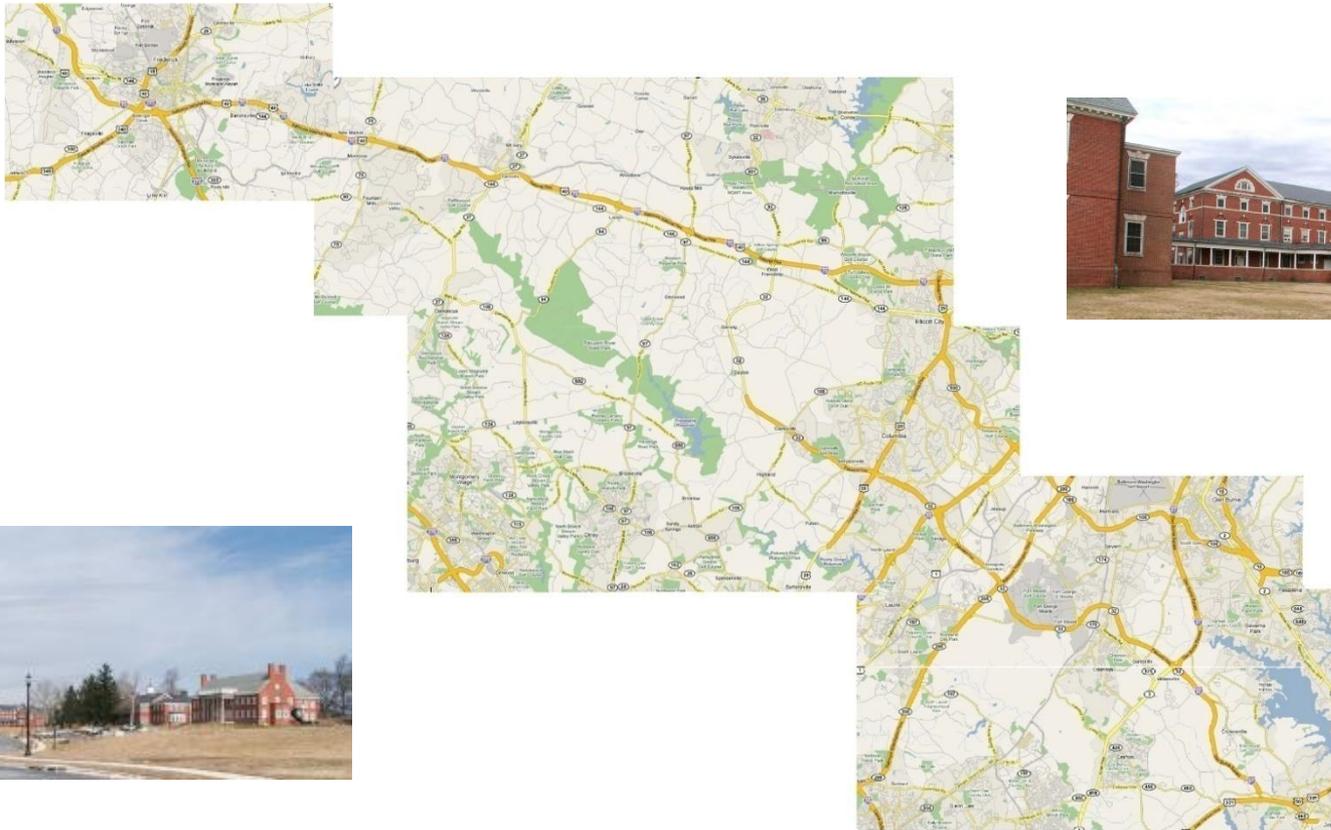


# What Is in a Continuity Park?

- Roughly 10 acres (in total)
- Core with EMP-hardened data and communications
- Protected utilities
- Local energy generation and storage
- Offices and housing as needed
- Emergency food supplies
- No cash required by HUGS

# EMP safe Fiber Optic Route

- Need POPs every 30 miles, why not your town?



# Civilian EMP Rating System

Instant Access Networks, LLC devised the Four-level EMP Rating System™ to show ranges of protection that may be relevant to various elements (power, data, communications) in a 4 level system-wide protection method where level three meets or exceeds various MIL SPECS for EMP and TEMPEST requirements:

IAN LEVEL	Base Shield	Compare to MIL SPEC 188-125		
		1KHz- 10 MHz (ea 20 dB is a factor of 10)	10 MHz-1GHz	1GHz-10GHz (-10 series only)
EMP 4	140 dB	60dB above MIL SPEC to 1KHz	140 dB (60 dB above MIL SPEC)	140 dB
EMP 3	100 dB	20dB above MIL SPEC to 1KHz	100 dB (20 dB above MIL SPEC)	100 dB
EMP 2	60 dB	20dB below MIL SPEC to 1KHz	60 dB (20 dB below MIL SPEC)	60 dB
EMP 1	30 dB	50dB below MIL SPEC to 1MHz	30 dB (50 dB below MIL SPEC)	30 dB

# Civilian EMP Rating System

- Modeled after Uptime Institute for data centers
- System of systems approach, 4 levels useful for
  - Networks, data centers
  - Factories
  - Industrial controls, micro grids
- Allows measurable nestable levels below MIL SPEC that can add to higher levels
- Provides for incremental improvements, cost-effective change management and maintenance
- Allows contracts to award for value at measurable levels below MIL SPEC

# Savings with Shielding

## From Sage EMP Assessment Study Sep '07

Exhibit 9: Total economic loss with and without shielding

	<i>Post-EMP capacity with shielding</i>			<i>Post-EMP capacity without shielding</i>		
	Low case	Middle case	High case	Low case	Middle case	High case
Total lost value of economic activity (billions)	\$9	\$30	\$586	\$34	\$212	\$771
Total lost value as share of annual regional gross domestic product	1.7%	5.7%	111.0%	6.5%	40.0%	147.0%
Total lost value as share of annual national gross domestic product	0.1%	0.3%	5.3%	0.3%	1.9%	7.0%

# FERC Order 779

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**Docket No. RM12-22-000**  
**Item No. E-5**



**FERC**

FEDERAL ENERGY REGULATORY COMMISSION

## **FERC Orders Development of Reliability Standards for Geomagnetic Disturbances**

The Federal Energy Regulatory Commission (FERC) today issued a final