



Space Weather Enterprise Forum

Wrap-up



We are Vulnerable in Several Areas

- Vulnerability may be increasing as global society becomes more technology dependent*



Potential for Extreme Societal Impact Remains

- While worst case electric grid scenarios may be in doubt,
[Risk of 130 Million without power] (NAS Study)
severe impacts can be spread across many technology dependent societal areas*



Threat Not Well Recognized

- Greater outreach/education needed*



2011 Studies Showing Critical Need for:

- > Risk Assessment & Mitigation Efforts*
- > Satellite follow-on & enhanced planning & funding*
- > Operational Prediction Capabilities*
- > Interagency Coordination*



Answering the Needs: Unified National Space Weather Capability

- OFCM & NSWP Council coordinating Agency Efforts*

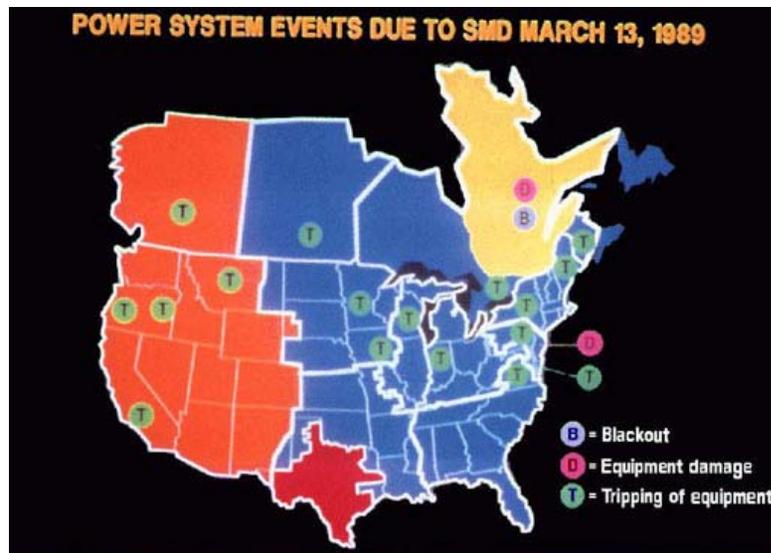


Space Weather's Most Significant Societal Impact?

Extreme events: Asian Tsunami – Katrina – Fukushima

**Will this be the next extreme event --
“Solar Storm causes 130 million people without power”**

Actual Observed Impact

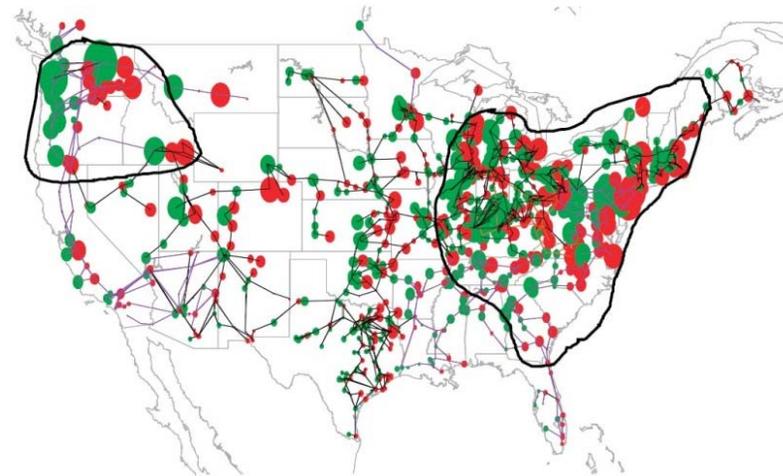


Potential Broad Area Impact

What if the May 1921 superstorm occurred today? A US map of vulnerable transformers with areas of probable system collapse encircled. **130 million people without power**

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SEVERE SPACE WEATHER EVENTS—UNDERSTANDING SOCIETAL AND ECONOMIC IMPACTS



National Academy of Sciences report entitled *Severe Space Weather Events—Understanding Societal and Economic Impacts*.



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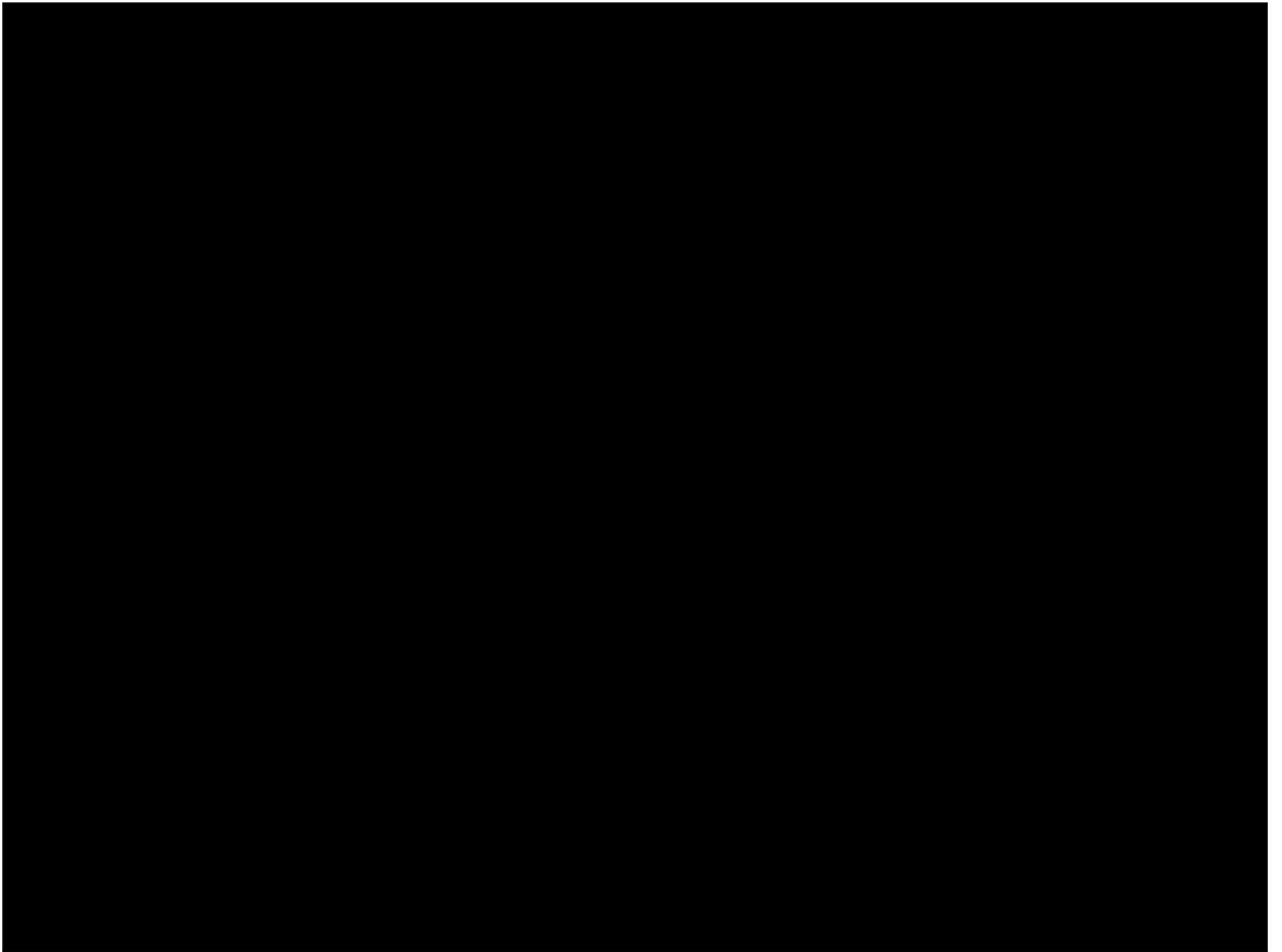
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Backup Slides



Space Weather's Most Significant Societal Impact?

Our Nation's Power Grid !

From Congressional Testimony:



“... a lighting strike, ...high winds/ tornado.... these events generally occur in isolation and power grids are operated to withstand the largest single contingency failure without causing a cascading collapse of the network.

Space Weather differs from ordinary weather in that it has a big footprint and attacks the system across many points simultaneously, causing at times of severe events multi-point failures on the network that can threaten the integrity of the broad network.

Therefore, geomagnetic storms may be one of the most important hazards to the reliable operation of these networks...

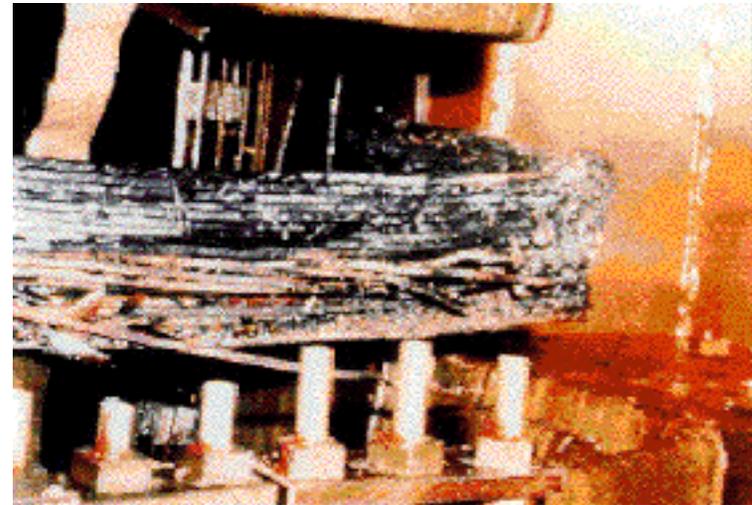


Severe Weather vs. Space Weather Impacts

**Tornado Damage Forces
Virginia Nuclear Plant
Shutdown for **24hrs****



**1989 Solar Storm shuts down
Salem NJ Plant
for **40 days****



***PJM Public Service Step-Up
Transformer: Severe internal
damage caused by the space
storm of March 13 1989***