

## H.R. 2417 - SHIELD Act Fact Sheet

- EMP Commission and DOD, DHS, DOE, NAS all report that the electric infrastructure is highly vulnerable to a man-made or naturally occurring EMP event.
  - The consequences of an EMP event can be catastrophic.
- DOD relies overwhelmingly on the commercial grid for its operations
  - 99% of DOD electricity is from sources outside DOD installations
  - 85% of DOD electricity is from sources outside DOD control
- EMP events are likely to occur
  - Rogue states continue to develop ways to attack the US with EMP producing weapons. (North Korea and Iran especially)
  - A Geomagnetic storm or severe space weather is possible and solar maximum (the normal period of greatest solar activity in the 11 year solar cycle of the Sun) is approaching (including a recent CME near-impact).
- Section 215 of the Federal Power Act establishes procedures for developing electric infrastructure industry standards.
  - These procedures are not designed to address emergency/urgent situations, for the procedures are time consuming and allow industry to procrastinate in their preparations against a major grid collapse.
  - These procedures are more designed for small-scale routine safety issues, such as tree-trimming.
  - In the event of an emergency, current procedures leave industry vulnerable to law suits and imperil society.
- SHIELD Act amends Section 215 to establish a working relationship between FERC and NERC to develop standards, including hardware based solutions, to address grid vulnerability to EMP events.
  - It does give FERC some authority to develop standards, BUT IT NEVER PRECLUDES NERC (INDUSTRY) FROM DEVELOPING THEIR OWN.
  - This increased authority is necessary to protect the ENTIRE grid.
    - Some industry stakeholders may develop these standards on their own, but unless the ENTIRE grid is uniformly resilient to EMP, cascading effects of blackouts resulting from stakeholders that did not protect their entities from EMP will most likely still cause rolling blackouts and massive outages.
    - Some industry stakeholders may not view EMP as a credible threat (e.g., Southern stakeholders may not feel threatened by solar storms because of their relative latitudinal protection).
      - Therefore, we cannot rely on voluntary action by industry stakeholders to protect against this threat.
  - Under SHIELD, regulations developed by FERC and NERC will be implemented uniformly to avoid the scenario mentioned above.
- Hardware-Based Solutions:

- The current posture that industry is taking is that they can handle a giant solar storm using operational and procedural actions
- This puts the electric industry at tremendous legal risk. In the case of a great solar storm, the main operational fix is to "shed load" so that the system is less stressed and has some room to absorb and withstand additional geomagnetically induced currents without overloading the transformers.
  - In an extreme case, a lot of load would have to be shed, resulting in blackouts or brownouts for most of the grid.
- These decisions to implement these procedures will have to be made within only 20-30 minutes warning given the current ability to predict storm impact.
  - These warnings are only 33% accurate.
- Therefore, the operational solution to a warning will put grid operators in the position of making a decision to either blackout some or even all of their grid to protect against the 1-in-3 chance that the solar storm does hit them, or continue to operate in hopes that the storm misses.
  - In any scenario where operators intentionally shut down the grid, lawsuits will most likely be filed by those adversely affected. This result is especially foreseen if operators err in their decision to shut down the grid or leave it running.
- Automatic Hardware-based solutions avoid this situation
  - There is hardware available today at minimal cost (some industry members have even said the cost is already covered under their normal operation and maintenance budget).
  - This hardware will automatically react to an EMP disturbance, removing the guessing-game operators currently face.
- Cost of doing nothing
  - A recent report by the National Academy of Sciences determined “*an estimate of \$1 trillion to \$2 trillion during the first year alone was given for the societal and economic costs of a “severe geomagnetic storm scenario” with recovery times of 4 to 10 years.*” For comparison: During the 2003 Northeast Blackout, the biggest blackout in US history, 50 million people lost power for up to two days, 11 people lost their lives due to effects of power outages, and the economic cost was estimated at \$6 billion. Hurricane Katrina caused \$80 to 125 billion in damage.
- Cost of hardware based solutions
  - Hardware developers believe that current devices costing \$100,000 - \$500,000 per transformer will provide full protection to transformers.
  - Placing these devices on 1000 most critical transformers in the US will result in a maximum cost of \$500 million and provide substantial protection.
  - Industry experts expect this cost to already be included in operation and maintenance budgets, with minimal effects on consumer rates.
- Conclusion: hardware based solutions designed to protect the grid against adverse effects of EMP will save lives and money.