



Secure the Grid Coalition
A Project of the Center for Security Policy
2020 Pennsylvania Avenue, N.W., Suite 189
Washington, D.C. 20006

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U.S. Department of Energy
1000 Independence Ave, SW
Washington, DC 20585

Addendum on China, re: Secure the Grid Coalition's DOE "Speed to Power" RFI Response

Dear Department of Energy:

In response to DOE's "Speed to Power" RFI (2025-18058), our Secure the Grid Coalition¹ urged the Department to act aggressively to protect our nation's electric grid against threats which produce Geomagnetically Induced Currents (GIC) by rapidly deploying the capacitive neutral blocking device known as SolidGround® across the roughly 6000 transformers that are vulnerable to GIC.

This memorandum is an update to those recommendations, warning that foreign nations – including a major foreign adversary – are already taking that step.

Shortly after publishing our recent report "*Speed to Power on a Firm Foundation: Overcoming Dangerous Assumptions That Put America's Future at Risk*" we visited the EMPRIMUS manufacturing facility for SolidGround®, witnessing the final tests being performed on a unit that reached production completion. Those tests performed as designed, and the unit was packed into a shipping container bound for another country, albeit an allied nation, but not the United States of America.

More worrisome is the emerging evidence that the People's Republic of China (PRC) is beginning to employ this technology across its electric grid. Our "Speed to Power" report warned that "China has infringed upon the patents of the only proven viable neutral blocking device, the EMPRIMUS SolidGround® system, and is in production of these duplicate counterfeits, which are being deployed within China."

This warning was issued based upon ongoing patent trolling witnessed by EMPRIMUS starting in 2012 and the discovery in May 2022 that a major American technology company deploying data centers across China witnessed the Chinese grid operators installing what appeared to be counterfeits of the EMPRIMUS SolidGround® unit on large power transformers supporting those data centers.

For the PRC to counterfeit and deploy transformer protection technology across its own infrastructures while targeting our own for attack is in keeping with Chinese military warfighting doctrine, specifically *Unrestricted Warfare*.²

Recently, our Coalition became aware of additional evidence of China's increasing interest in deployment of the capacitive neutral blocking devices across the PRC grid – this time through a recent publication by Chinese researchers in an IEEE document associated with the 2023 8th Asia Conference on Power and Electrical Engineering (ACPEE) [979-8-3503-4552—0/23].

¹ The Secure the Grid Coalition is a group of policy, energy, and national security experts dedicated to strengthening the resilience of America's electrical grid. It is sponsored by the Center for Security Policy, a 501(c)(3) nonprofit which receives no funding from governments, foreign sources, the electric industry, or any for-profit corporations involved in protecting the grid, including EMPRIMUS, which has developed the capacitive neutral blocking device known as SolidGround®

² *Unrestricted Warfare*, authored in 1999 by two PLA colonels, describes an attack sequence against a developed nation: secretly muster capital, strike financial markets, embed malware in computer systems, then paralyze "the civilian electricity network, traffic dispatch network, financial transaction network, telephone communications network, and mass media network" to trigger "social panic, street riots, and political crisis." The passage appears on pages 145-146. Thus, electric grid disruption is stated doctrine.

The document, titled “*Research Summary on Transformer DC Magnetic Bias and Suppression Technology*” discusses the risks of DC bias in transformers due to ground currents which enter the transformer neutral and can cause half cycle saturation, which greatly increases harmonics, current excitation and distortion, temperature increases, loss increases, and vibration intensification – threatening the safe operation of the transformer. Similar to the process the Department of Energy went through under EO 13744 analyzing technologies to protect transformers and prevent DC bias, this research paper indicates that China has gone through their own process and is focused on capacitive DC blocking devices as the solution.

On page 2718 of this paper, the Chinese researchers state the following:

“At present, most neutral grounding transformers of 220kV and above substations in China are mostly considered to install capacitor DC blocking devices”

The paper provides schematic illustrations of the “capacitor DC blocking devices” as well as schematics showing the addition of a resistor in series with the capacitor, which are copies of the concepts and designs of SolidGround®.

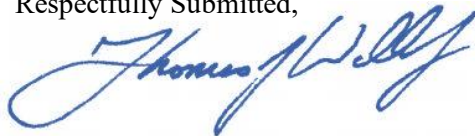
China has modeled their grid and written extensively of their concerns of GIC on their power grid which causes “DC bias” in transformers. China EPRI as well as other state-run entities have ramped up their patent applications in China around “capacitive neutral blocking.” While this paper addresses the issue of DC bias from ground current due to HVDC operation rather than GIC from solar weather or E3 HEMP, the above statement about the deploying of capacitive DC blocking devices on the neutrals of transformer of “220kV and above” (in addition to the installation of capacitive DC blockers in the neutral of transformers providing power to data centers), can be considered evidence that the Chinese are in fact taking steps to protect their transformers from DC ground currents, including GIC.

EMPRIMUS continues to spend most of its time working with foreign customers outside of China and the demand appears to continue increasing abroad for its SolidGround® technology, while the U.S. grid – which is much more susceptible than many of these other nations – remains vulnerable.

We therefore recommend DOE take urgent action to address the GIC threat through the rapid deployment of SolidGround®.

Finally, as a reminder, our Secure the Grid Coalition and its sponsor – the Center for Security Policy – refuses funding from foreign sources, governments, and corporations – such as EMPRIMUS – who can profit from our policy recommendations. We provide these recommendations purely in the public interest and we stand ready to assist DOE as needed in pursuit of our shared goals to Secure the Grid.

Respectfully Submitted,



Lt. Col. Thomas J. Waller Jr. (USMC Ret.)
Co-Director
Secure-the-Grid Coalition
twaller@centerforsecuritypolicy.org



Douglas. Ellsworth
Co-Director
Secure-the-Grid Coalition
doug.ellsworth@usapact.org