

Key South Carolina Efforts to Help Assure the Viability of the Electric Grid

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See www.highfrontier.org for more information.

Briefing to Aiken Republican Club
Aiken, SC — January 28, 2020

For more information on the threat and how to get involved to protect your family and friends, see www.highfrontier.org and its links to others who are already engaged in this important fight.

Briefing Outline: Protecting the Grid!

Existential Threats

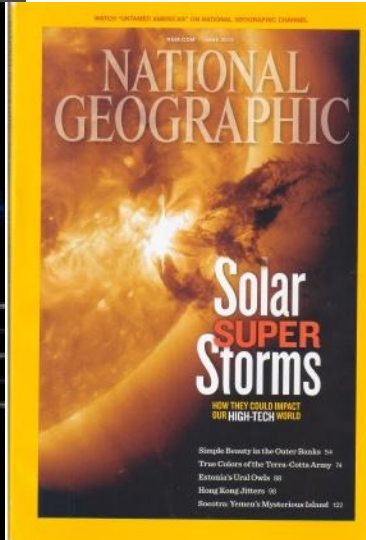
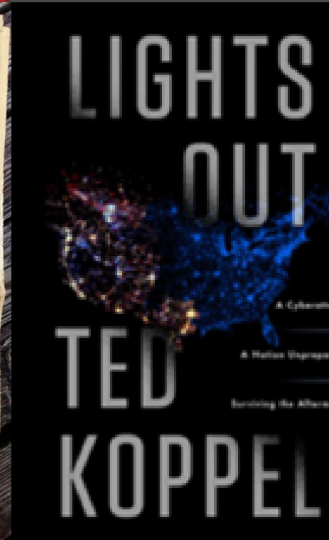
- *Electricity is Essential*
- *Manmade & Natural Threats*
- *Lethargy in Washington*

What can/should be done

- *Protect the Electric Grid*
- *Missile & Cyber Defense*
- *Physical Protection*

Significant State and Local roles

- *Potential National Guard leading role*
- *Key SC Contributions*
- *Lake Wylie Pilot Study working the problem from the bottom up!*



Washington is waking up to this threat, especially in the wake of President Trump's Executive Order, but it is still essential that State and Local authorities engage—South and North Carolina can help assure this existential threat is

President Trump Has Formally Indicated His Awareness of the Threat to the Electric Grid

“Critical infrastructure keeps our food fresh, our houses warm, our trade flowing, and our citizens productive and safe. The vulnerability of U.S. critical infrastructure to cyber, physical, and electromagnetic attacks means that adversaries could disrupt military command and control, banking and financial operations, the electrical grid, and means of communication.”

President Donald J. Trump

December 18, 2017 National Security Policy

His November 2019 Executive Order directed the Federal Government to develop an integrated plan to counter the existential EMP threat, and Wisconsin Senator Ron Johnson’s Amendment to the 2020 National Defense Authorization Act made it the “law of the land.”

Important Witness of the Nature of the Threat!

- Former Strategic Command (STRATCOM) Commander, and now JCS Vice Chairman, USAF General John E. Hyten understands and has observed the EMP threat is real:

“[O]ur nation as a whole has not looked at EMP, we have not looked at the critical infrastructure that could be damaged by EMP, and we need to take a step back and look at that entire threat because it is a realistic threat.”



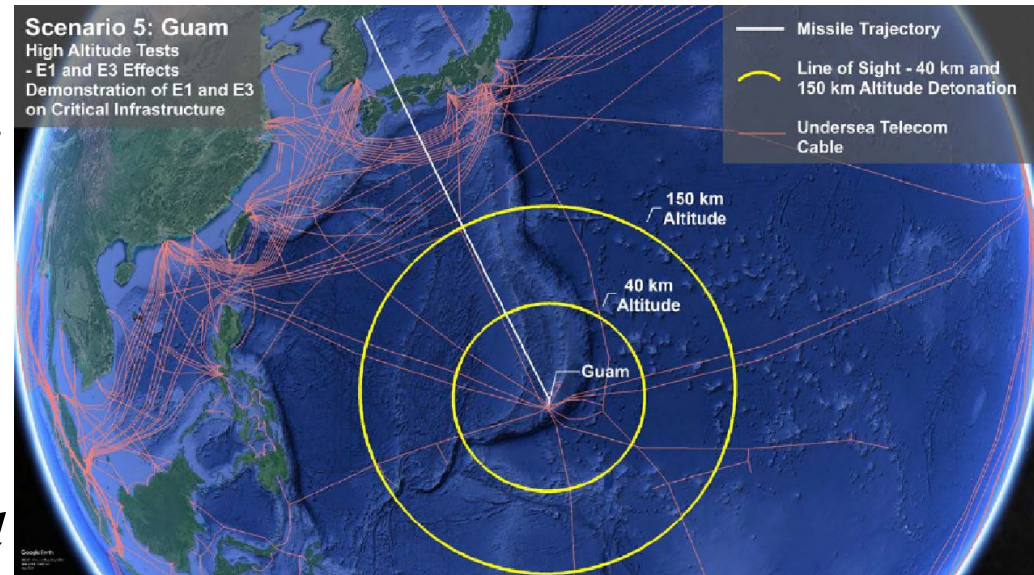
- As STRATCOM Commander, General Hyten supported testing our strategic systems and their command and control systems to assure they survive an EMP attack and that the President can control them afterward.
- Hopefully, as Vice Chairman, he will support National Guard initiatives to help assure our critical civil infrastructure is also viable in case of threats to our electric power grid.

Indeed, North Korea claimed achieving an EMP attack capability is a “Strategic Goal”—and they now have the ability to execute that threat!

Even a North Korean Atmospheric Nuclear Test Could Pose Catastrophic Consequences!

“In the most severe scenario of an all-out attack upon undersea cable infrastructure by a hostile actor the impact of connectivity loss is potentially catastrophic, but even relatively limited sabotage has the potential to cause significant economic disruption and damage.”

~ Former NATO Commander retired US Navy Admiral James Stavridis



Cable Paths: TeleGeography. "Submarine Cable Map." August, 11, 2017; paths are indicative but not precise.
Graphic: Foundation for Resilient Societies

The electromagnetic pulse (EMP) from high altitude nuclear explosions could disable the world's entire undersea cable network that reportedly carries about \$10 trillion of financial transactions in a single day as well as huge volumes of data, from e-mails to classified government-to-government information. Moreover, such an event could disable the earth satellite communications—and, under the best of conditions, satellites could carry only 7-percent of the communications from the United States alone and they would likely be disabled by the same high altitude nuclear bursts.

EMP is a very threatening component of the Military Doctrine and Cyber attack strategies of Russia, China, North Korea and Iran

The South Carolina National Guard has an Important National Role—including the 263rd Army Air and Missile Defense Command (AAMDC)

- *In Anderson, SC, manned and led by SC National Guard personnel—a direct report to SC Adjutant General, under the SC Governor*
- *Already linked to critically important elements of our Homeland Defense via:*
 - *Commander Northern Command in Colorado Springs, CO*
 - *Commander First Air Force at Tyndall AFB, FL*
 - *Commander Fifth Army (Army North) at Ft. Sam Houston, TX*
- *TBD Role with respect to potential Aegis Ashore deployments*



Including the 263rd AAMDC in extensions of our Lake Wylie Pilot Study, being conducted in conjunction with Duke Energy, will assure involvement across the nation—and is responsive to an important NDAA (2020) directive

Nuclear Power Reactors may be a hazard, but can be a critically important part of the solution!

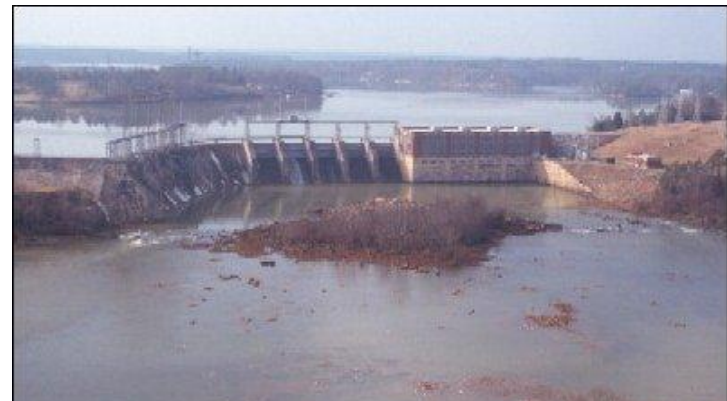


- *Reactors produce about 20% of US electricity—most are in the “Eastern Interconnection”*
- *Reactors produce about 50% of SC electricity, only Pennsylvania and Illinois are more so*
- *If they lose the grid, they will shut down, possibly leading to multiple meltdowns*
- *Result could be up to ~98 Fukushimaes, with radiation carried by wind across the U.S.*
- *However, if engineers can figure out how to make them viable in such a shutdown, they would be important in reestablishing the national grid.*

Top priority: Assure nuclear reactors can be restarted after a grid shutdown and become a source for restoring electricity to all Americans—SC & NC can help begin such an initiative!

Lake Wylie Pilot Study pilot study on assuring viable power plant and transmission and distribution grid operations after a major attack on the grid!

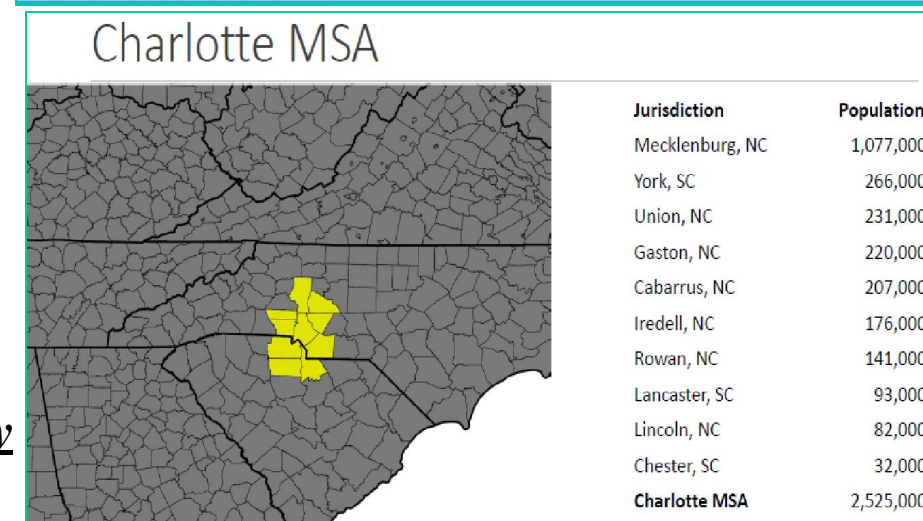
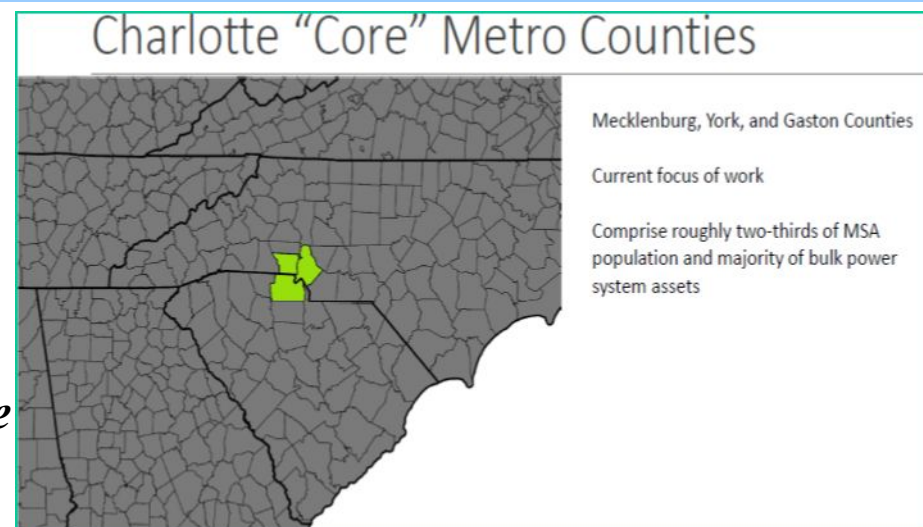
- *Engineers at Duke Energy, one of the largest U.S. electric power companies, are on board!*
- *Involving national level experts in this planning—as well as other power companies and the Electrical Engineering Departments of several universities.*
- *Lake Wylie Pilot Study has demonstrated hardening costs for Distribution Grid are quite affordable—one-time cost of \$100 per citizen of York County; still working with Duke Energy to understand cost for protecting their Power Plants and Transmission Grid.*
- *Expect White House Chief of Staff Mick Mulvaney (and Former SC Representative, whose district included Lake Wylie) will be supportive—as are Mulvaney's successor Rep. Ralph Norman and Reps. Joe Wilson, Jeff Duncan, William Timmons and hopefully others.*
- *Senator Ron Johnson, Chair of Homeland Security Committee, is very supportive—as are members of the Senate Energy and Natural Resources Committee.*



SC Adjutant General Van McCarty supports this important initiative, with appropriate links to key local, state and federal authorities

Background for Protecting the Electric Grid Around Charlotte, NC—Home of Duke Energy Corporate Hqtrs.

- **“Core” has ~62% of Charlotte Metropolitan Statistical Area (MSA) population in 10 surrounding counties; Mecklenburg County, NC has ~69% of Core and ~43% of MSA;**
- **York County, SC has ~17% and Gaston County, NC has ~14% of Core Population .**
- **Overall, expect Core generation costs to dominate and for Duke plants to dominate MSA power source...over 99% of 6177 MWs.**
- **Nuclear plants produce almost 80% of Charlotte Core power.**
- **Lake Wylie on the Catawba River is home of Duke Hydroelectric and Nuclear Power plants in York County, SC and a NC Duke Coal Power Plant in Gaston County, NC**
- **Utility companies and Electric co-ops are primary sources of electricity to the citizenry**



Once we complete the “Core” counties, extend the analysis (including cost estimates) to the 10 “MSA” counties as a model to be followed throughout the nation.

Bottom Up Strategy: Study Rock Hill Utility and York County Electric Cooperative & Extend to SC/NC Counties

•Start with Rock Hill Electric Utility

–Strong support from Assistant City Manager

Jimmy Bagley—Clemson EE Graduate—and his staff

–Opened doors to lead Rock Hill engineers, including Mike Jolly, Electric Utilities Director, and the lead Hospital Engineer

•Bagley is President of Piedmont Municipal Power Agency (PMPA)—and no doubt will transfer lessons learned to the utility companies in 9 additional cities in Northwestern SC—these companies own an interest in the Catawba Nuclear Plant

•Mike Jolly is VP of SC Association of Municipal Power Systems (SCAMPS), including all 21 SC municipalities, including the 10 PMPA municipalities

–Lessons learned will be widely shared

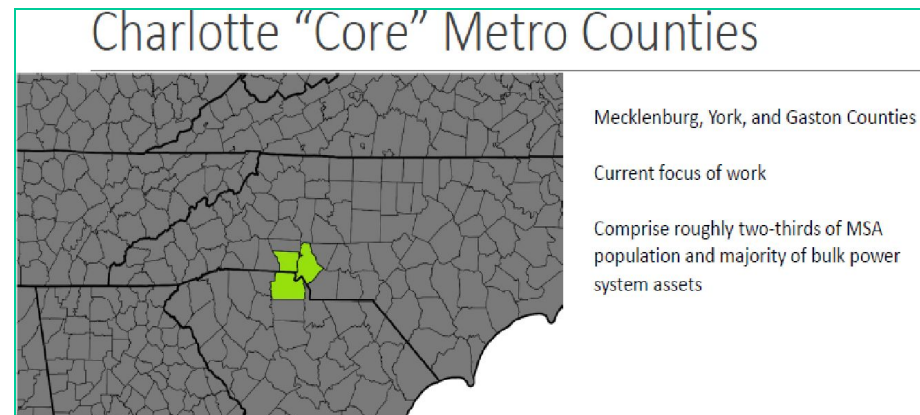
•Extend to York County Electric co-op

--CEO Paul Basha attended Clemson

--Uses New Horizon Electric co-op Infrastructure, also used by four other SC county co-ops—constituting a link for sharing lessons learned to all five counties

--Provided infrastructure information to support associated costing studies

--Member of Electric Cooperatives of South Carolina (ECSC)—20 consumer-owned SC co-ops serving over 1.5 million customers in all 46 SC counties



ASAP, go to Gaston County, NC—supported by a Gastonia Electric Utility Company and Gaston County co-ops, then all 26 co-ops in NC. Also ASAP, extend to Mecklenburg County, home of Charlotte's Duke Corporate Headquarters.

Near Term Plans and Recommendations

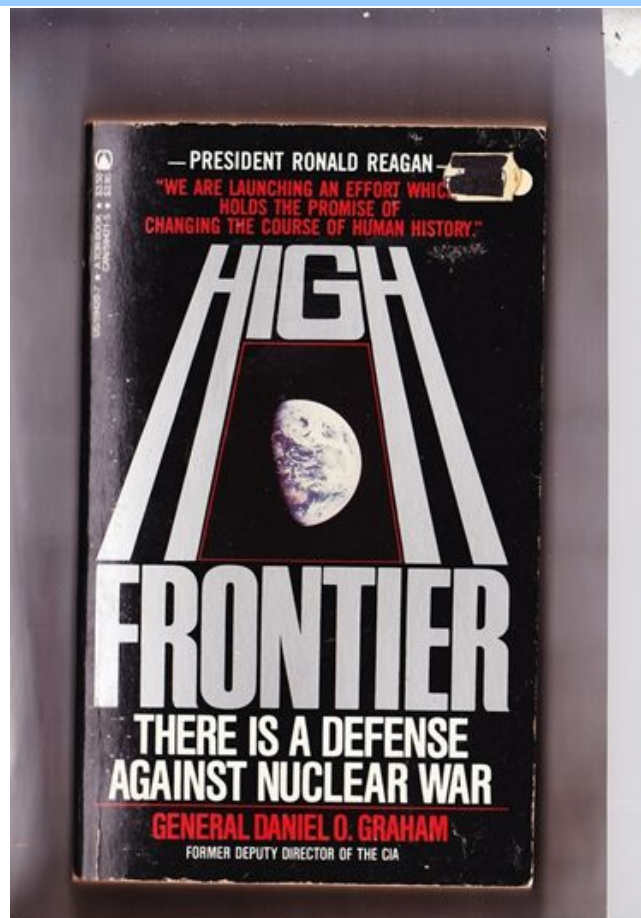
- *Work with Duke Energy, Rock Hill and York County Co-op officials & SC/NC citizens to complete the York County Pilot Study, and map a strategy to take lessons learned throughout SC, NC and beyond—including with credible cost estimates for effective grid hardening measures*
- *Integrate Lake Wylie Pilot Study plans and next steps with 263rd Army Air and Missile Defense Command to develop an initiative to support NDAA (2020) directive that the National Guard address EMP protection of the electric grid.*
- *Help Adjutant General Van McCarty, the National Guard, the SC Director of Emergency Response, and the SC Law Enforcement Division (SLED) plan how best to exploit lessons learned from the Lake Wylie Pilot Study*
- *Help gain support for SRNL to test huge Transformers and other grid components*
- *Design an integrated game plan to help gain needed support from SC and federal agencies, including the Departments of Homeland Security, Energy and Defense*
- *Work with the SC Public Service Commission to explore rate restrictions that could influence protecting the electric power grid*

See www.highfrontier.org to follow how this important initiative extends its lessons throughout South Carolina and beyond!

Please Let Us Hear From You!

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*Check out our webpage at
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Thanks for your support—the vision lives on!!!

At High Frontier, we dedicate ourselves to passing to future generations the blessings passed to us by the Founders and Forefathers.

May God bless America!