

The Path Forward to Communications Resilience Protecting the Current Infrastructure Investment and Preparing for Tomorrow's Threats

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Electric Infrastructure Security Council

The Electric Infrastructure Security (EIS) Council

Addressing severe hazards to critical societal infrastructures. EIS Council facilitates national and international collaboration and planning to protect our societies' critical utilities against uniquely severe Black Sky Hazards. Our programming and special projects help utilities and their partners develop and implement cost effective, consensus-based protection measures by hosting frameworks for sustained coordination, planning and best practice development.



Communications is Critical to Electrical System Restoration

- Black start procedures cannot be effectively executed without voice communications between the generation site and system operations.
- Operational data exchange would ideally be desirable, but not necessary in the earliest stages of the restoration



Black Sky Communications & Coordination System BSX[™] Vision

The BSX[™] System will be an interoperable, all hazard-protected emergency communication and coordination system which will operate during emergencies and catastrophes without requiring connectivity to the nation's traditional telecommunications networks.





Features of BSX

- Utility dark fiber backbone
- Utility owned and controlled
- Firewalling and security
- EMP-protected radios, network devices, and power supply











Why Dark Fiber?

- Inherently EMP-protected (so long as the network equipment and power supply are similarly protected)
- Existing utility asset under utility ownership and control
- Secure most of it sits atop transmission lines (high off the ground) or underground
- No data latency issues





Why Utility Controlled?

- Utilities have already made the investment and BSX leverages that investment
- Utilities generally do not have a priority with commercial telecommunications providers for their mission critical services
- Utilities pay substantial charges to commercial telecommunications providers for leased service today







BNET Family of Radios





Secure Power Source

 BlackStarTech, an Exelon Generation business, is developing a set of emergency power products that could be adapted for use in BSX

BLACKSTARTech Equipment Staged for Quad Cities Pilot

BLACKSTARTech Basic equipment:

- Two 125VDC/250VDC Power Carts for reactor core isolation cooling and automatic depressurization system valves.
- Each cart is supplied by one 240VAC 7500W propane generator.









BSX ™ Pilot 1

- BSX network was tested in the fall of 2019 as part of Grid-Ex, a North American wide emergency procedures exercise
- A voice communications link was established via a utility owned handheld Land Mobile Radio unit back to the PJM Control Center, using portions of the Dominion dark fiber network (approx. 200 miles between Dominion and PJM)





BSX ™ Pilot 2



- Demonstrate the ability to implement a multi node fiber network and the level of effort (cost and schedule) necessary to build out a larger network
- A range of existing utility communications systems will be tested for interconnectivity to the proposed BSX[™] network

Similar Projects in the US

ISO-NE (Independent System Operator-- New England)

Installed a dark fiber network among 6 transmission owning utilities to provide an alternative network option sitting atop 2 existing commercial clouds

• ATC (American Transmission Company) Wisconsin

Installed a dark fiber network connecting its operations centers on owned dark fiber as well as connection to the state emergency operations center

Neither network is EMP-protected at this point, but ATC is investigating protecting the power supply that supports the network





Longer Range Vision of BSX™

 Connectivity to Reliability Coordinators (RCs) and other transmission entities



- Provide the multi-hazard protected network that can assured to be operational during the most severe events where communications and coordination among the RCs will be necessary to black start the system and facilitate system restoration and recovery
- Provide private, secure network for day-to-day coordination activities of the RCs as well as the transmission operators (TOPs), transmission owners (TOs), generation operators (GOPs) and generation owners (GOs)



Longer Range Vision of BSX

• Connectivity to Utility Field Forces



- Provide a private, multi-hazard secured network onto which similarly hardened components can be connected to enable uninterrupted communications to field crews during emergencies and in normal operations
- Hardened components to provide maximum interoperability with the full range of existing utility communications systems



Longer Range Vision of BSX

• Primary or Back Up Network for ICCP Data Exchange



- Normal system operations requires continuous high rate data exchange among the various reliability entities to feed control systems.
- BSX can provide a private, utility controlled multi-hazard protected network to accomplish the data exchange as the primary carrier or as a back up

Source: GE Telecommunications Brochure

