Securing and Sustaining our Nation(s)
Progress and Highlights of EIS Council’s Critical Infrastructure Resilience Initiatives
1st Quarter, 2020
“Black Sky hazards” Natural and malicious scenarios taking place at a level that could disrupt essential societal infrastructures on a subcontinental scale. Hazards addressed include cyber and EMP attacks on critical utility nodes, extreme solar or terrestrial weather, and extreme earthquake zones.
Catalyzing and Hosting Rapid Progress

Modern infrastructures, resource and service sectors and their supply chains may be considered a “meta-grid:” the merged, hyperconnected, global-scale system that sustains our world.

The growing interdependencies and limited hardening of this merged system have introduced a new class of vulnerabilities: Extreme “Black Sky” hazards that could disrupt the electric grid and other infrastructures on unprecedented scales. Without expanded resilience planning and focused investment, infrastructure restoration from a severe cyber or EMP attack or a large-scale natural catastrophe could not, today, take place quickly enough to sustain society.

EIS Council\(^2\) was founded to catalyze rapid progress in developing this capability – in enabling critical societal infrastructure protection and recovery measures for emerging, extreme hazards. As a key strategy to address this mission, Council projects are leveraged by hosting planning that brings together key government and corporate stakeholders in the US, Israel, the UK and partner nations.

Mission

Hosting national and international collaborative resilience planning and sector-specific and multi-sector research, tools and capabilities judged critical to enable restoration and societal continuity in complex catastrophes. The Council’s major projects, reviewed below, emerge from this mission.

\(^2\) EIS Council is a 501(c)(3) NGO.

Research and Education

Annual World Summits on Black Sky Infrastructure Security

Beginning in 2010, EIS Council’s hosted ELECTRIC INFRASTRUCTURE SUMMIT SERIES quickly became the primary international framework bringing together senior government, corporate, utility and NGO leaders to plan coordinated resilience addressing severe infrastructure disruption.

EIS Summits have brought together speakers ranging from the US Secretary of Energy to UK Secretaries of State for Defense, CEOs and executives of the world’s largest electric utilities, water companies, disaster response NGOs, national banking authorities, and the principal cyber directors of the US, the UK, Israel and Japan. The summit series has become the primary international forum public and private sector leaders have used to inaugurate visionary new Black Sky initiatives that are now transforming infrastructure resilience.
EIS PLAYS KEY ROLE IN REWRITE OF US GOVERNMENT EMERGENCY RESPONSE POLICY

One of the most important results of EPRO SECTOR’S SYSTEMS ENGINEERING-FRAMED PLANNING has been the unique EPRO HANDBOOK SERIES. The Handbooks report on the underlying peer-reviewed Black Sky resilience policy and implementation research that informs the Council’s hosted systems engineering initiatives.

As a result of EIS Council’s EPRO Handbook III, EIS was asked to work with FEMA’s leadership to help guide the REWRITE OF THE US NATIONAL RESPONSE FRAMEWORK (NRF), which guides national disaster response of all levels of government, including DoD, all federal agencies and the States. The new Framework represents a landmark policy change, now calling for “Industry led, government in support” operations in emergencies, with a cross-sector coordination process to ensure integration of effort.

– Approved, November 2019.

EPRO HANDBOOK IV: ELECTROMAGNETIC PULSE (EMP) BEST PRACTICES HANDBOOK

One of the most important gaps in current and developing grid restoration planning is cost effective, widely deployed electromagnetic hardening, to enable restoration and population sustainment in an EMP scenario. Yet until now, there has been no comprehensive resource available that lays out hardware vulnerabilities, best protection strategies and specific, affordable hardening measures for different grid systems and components.

Later this year, EIS Council will publish the first peer-reviewed EMP Protection Handbook. Developed with the cooperation of US and Israeli electric utilities and the Defense Threat Reduction Agency. The participating DoD DTRA team was headed by Michael Rooney; Branch Chief, Nuclear Survivability, Defense Threat Reduction Agency (DTRA), US Department of Defense.
Exercise and Training

EARTH EX®: ALL-SECTOR GLOBAL RESILIENCE
EXERCISES & BLACK SKY PLANNING WORKSHOPS

“A PLANET-SCALE EXERCISE FOR A
RESILIENT, SECURE SOCIETY.”

Responding to expanding malicious and natural risks to today’s tightly interdependent globalized infrastructures and supply chains, EARTH EX hosts the world’s only all-sector, global resilience exercise. The Exercise enables unprecedented multi-sector local, national and international collaboration in building and implementing plans to protect critical societal lifelines and sustain our societies.

This highly engaging exercise brings together families, corporate and government teams and executives in all sectors, every US State and many nations. In 2019 more than 11,000 people and nearly 2000 corporations and agencies spanning 42 countries worked together, building concrete plans for each organization to collaboratively enable societal continuity following a subcontinent-scale power outage.
EARTH EX BLACK SKY PLANNING (BSP) WORKSHOPS have become a unique, Black Sky-class organizational resilience planning tool. Facilitated by EIS Council’s emergency management team, the workshops integrate EPRO® SECTOR systems engineering-framed interdependency planning with acclaimed EARTH EX® Black Sky Exercise video injects to create a compelling, exercise-driven planning environment.

EARTH EX BSP was refined in early use by leading US and UK corporations, most US federal agencies and the governors and cabinet officials of nearly a third of the States. Corporate and government leaders are using it to deepen resilience planning while identifying specific resource and service gaps emerging from external interdependencies.
Resilience Planning

**EPRO EXECUTIVE COMMITTEE: ALL-SECTOR BLACK SKY EXECUTIVE PLANNING MEETING**

In our hyperconnected world, hosted, all-sector coordinated planning is essential if we are to be capable of meaningful recovery from Black Sky-class national-scale infrastructure disruption. The Council now hosts regular EPRO EXECUTIVE COMMITTEE (EC) planning meetings to address this need, with delegates including senior executives from a range of key public and private sectors.

In December 2019, EIS Council hosted an EPRO EC meeting at PJM Interconnection Headquarters in Audubon, Pennsylvania, with executives from Dominion Energy, Exelon and PJM, along with finance, water and telecommunication partners, government agencies and state and federal utility commissioners. The delegates inaugurated a range of new resilience initiatives, including critical multi-sector measures that will be needed to recover from extreme hazards.
BLACK START PLANNING EXECUTIVE WORKING GROUP: ENABLING GRID RESTORATION FOR BLACK SKY CATASTROPHES

After the 2018 summit, EIS began hosting a twice-monthly “black start” electric utility planning executive working group. With participation of vice presidents and ops managers of the five largest US electric companies, this working group just completed its first recommended “template,” designed to guide planning and investment to enable grid restart after a subcontinent-scale blackout.

EPRO Executive Committee, Winter 2019, at PJM Headquarters, Audubon PA
Technology Development

IGINOM™: THE GLOBAL INFRASTRUCTURE NETWORK OPTIMIZATION MODEL™

Today’s globe-spanning networks of product and service infrastructures, the fast-evolving high-tech markets that support them and the massive urban landscapes that have grown around them represent a deeply interdependent complex system. When this system is disrupted in a Black Sky scenario, effective decision-making to enable infrastructure restoration and societal sustainment will require an ability to foresee network operations and their response to restorative actions. Yet accurately mirroring infrastructure operations represents a major technical challenge in terms of research, engineering and logistics.

IGINOM is an AI-enhanced modeling framework designed to bridge this research to
implementation gap. Now completing the first phase of development, GINOM offers an iteratively expanding computational simulation platform. Initially supporting broad exercises, the system will allow decision makers to evaluate the consequences of different response actions to a complex catastrophe in simulation, before such catastrophes are encountered in reality.

This exercise process also lays the groundwork to continually support deeper and more advanced capabilities, including the real time decision support, in all sectors, that will be vital to operational teams in extreme disasters. Based on cutting edge multiplayer online gaming technology, the platform is structured to allow for rapid enhancement by integrating and utilizing all available, detailed infrastructure models, using disparate simulation technologies.

BSX**: GRID-INDEPENDENT EMERGENCY COMM

All Hazard, All Sector Comm, Enabling Large Scale Recovery

In every exercise and all research hosted by the Council, a primary lesson learned was that secure, all-sector grid-independent emergency communication will be essential in any complex catastrophe involving a large scale, long duration blackout.

In 2019, EIS hosted power industry testing of the backbone of a unique emergency communication system, capable of EMP-protected voice and data connectivity without an operating power grid or conventional telecommunication assets, and with virtually unlimited scalability. Working with the FCC, Dominion Energy and the electric subsector’s biennial GridEx exercise, the system demonstrated excellent performance. The testing successfully demonstrated the BSX core mesh network element, BNET - RAFAEL’s best-in-class, hardened military communication system, already in use by Israel and the eight other nations.

Dominion Energy testing of the BSX BNET’s network capability
International, Multi-Sector Collaboration for Supply Chain Security

Supply Chain Risk Management (SCRM) is considered today perhaps the most dangerous dimension of the fast-growing cyber threat. Given this hazard’s singular potential to disrupt utilities and infrastructures on national and global scales, over the past two years EIS has been working with US and international public and private sector leaders to develop a unique new approach to address this risk.

Conceived as a broad, collaborative multi-sector SCRM initiative, CPIC is being developed to integrate and leverage market-wide, multi-sector and international resources to drastically reduce this risk for critical processes of utilities and other important sectors.
IN SUMMARY: EIS Council, 2020

The Council in 2020 is at a critical threshold. US, UK and Israeli government agency and corporate partners now consider the Council’s efforts key to address expanding risks of complex catastrophes: to host and catalyze the coordinated multi-sector planning and investment needed to enable restoration and population sustainment in Black Sky-class, complex catastrophes.

As each of its major initiatives continues to develop, these partnerships will become increasingly essential to reach these critical goals.
For more information, please write to info@eiscouncil.org