

ESSENCE 2.0

Integrated Cyber/OT Protection
Defending America's Energy Supply



UNMATCHED ADVANTAGES



Market-ready early warning system for the broader infrastructure community



No other technology can be used by cybersecurity and operating engineers to protect IT/OT systems against unknown, emerging threats



Combined IT/OT deep-packet processing provides cyber/physical threat intelligence for swift action



Elevates cyber awareness for coordinated response for internal and external stakeholders via secure information sharing techniques



Cost-effective and sustainable for all utilities—4 to 5 times less costly than similar technology

A Proven, Industry-Ready Solution

Essence 2.0 is a proven, industry-ready solution to enhance America's cybersecurity posture. The technology is used by cybersecurity teams and operating engineers to protect key systems against unknown, emerging threats.

It is both a "black box" sensing technology that measures the continuous behavior of OT and grid physics data and a visualization and monitoring tool that allows utilities to interact with data and receive immediate notice of anomalous issues that could indicate a breach.

Essence 2.0 continuously assesses the electric grid for anything out of the ordinary. It provides real-time indicators when unusual circumstances are detected, which allows for prompt decision-making to counter the threat.

NRECA has implemented the technology at strategic electric co-op partners and is scaling the initiative to 55 additional cooperatives and other utilities. Utilities are strategically chosen to advance specific objectives and represent a cross-section of the marketplace while providing the greatest impact on coverage and protection.

Essence 2.0 allows us to focus on the data points that matter in a timeframe that allows us to act quickly - protecting our infrastructure from dangers on the network.

— Don Bowman
Vice President-Engineering and Operations
Wake Electric Cooperative



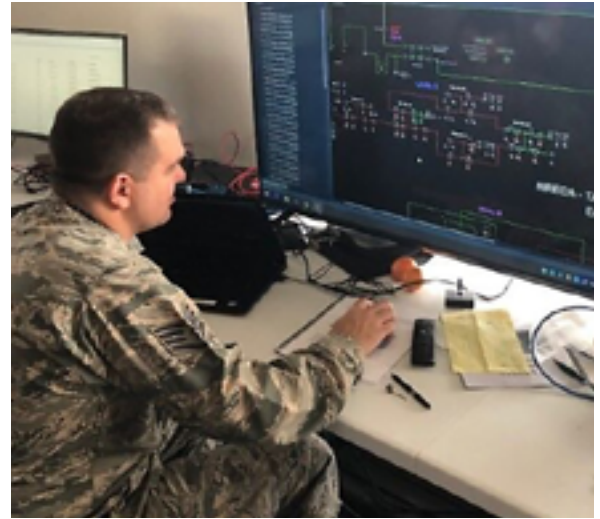
Many cybersecurity breaches camp out on a system for months before they are identified and mitigated. **Essence 2.0 accelerates our detection and mitigation action from months to seconds.** It also provides specificity to enable immediate actions for isolation and defines characterization of the breach for sharing with others to determine if there may be a larger coordinated attack by adversaries.

Government-Industry Partnerships

Information sharing, technology development and coordination among industry and government partners are essential for improving cybersecurity.

Essence 2.0 has been developed in collaboration with the U.S. Department of Energy¹ and our development partners, BlackByte Cyber Security, LLC. and Referentia Systems. The public/private partnership has developed an affordable, immediately useful solution for protecting against threats that could impact national security and public safety. Importantly, this is a fiscally sustainable solution for the electric sector, particularly smaller utilities.

NRECA has proven the Essence 2.0 capabilities. Third-party evaluation confirmed that the technology captured threat indicators for immediate response to realistic cyber and grid attacks.



ESSENCE was validated by U.S. National Guard cybersecurity threat hunters coordinating with utilities at the DARPA RADICS test range.

NRECA PLATFORM EVOLUTION

2014

Essence™ (DOE)

- 5-layered architecture: Data, information, analysis, decision, action

2017

RC3 - C4 (DOE)

- Dynamic asset discovery and network mapping
- Real-time detailed visualizations
- Advanced user analysis
- Utility partner validation

2018

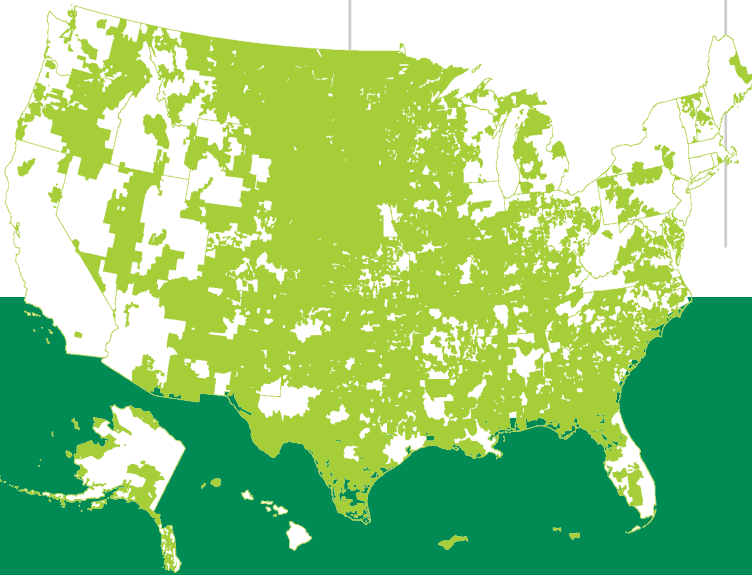
RADICS GridState (DARPA)

- High-performance time series database
- Real-time OT deep-packet protocol processing
- Anomaly detection engine
- Advanced power grid and analysis visualizations and user interfaces
- Validation testing on energized power grids (DARPA-RADICS live test range)

2020

Essence 2.0™ (DOE-CEDS)

- Integrated, real-time technology platform
- Extensible anomaly detection library
- Interactive visualizations for operations and analysis
- Incident Response Management System (IRMS) sharing network for coordinated response
- Capability validation and verification in partnership with National Guard cyber experts and utility operators
- Transition to strategic utility partner power system and operations



NEARLY **900** ELECTRIC COOPERATIVES COVER

56% OF AMERICA'S INTEGRATED ELECTRIC GRID.

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