

# Cyber Physical Resiliency Experimentation and Assessment Using Federated Testbed



**CREDC**  
CYBER RESILIENT ENERGY  
DELIVERY CONSORTIUM

*Simplifying asset and resource sharing for advanced power grid resiliency research*

In order to conduct large-scale power grid experimentation, site-specific models and simulation toolkits from architecturally diverse and geographically dispersed systems must be accessible to research labs, academic research centers, and industry partners nationwide. But duplicating and distributing research environments is extremely costly, inefficient, and difficult to support long-term. This project develops the federation capabilities for large-scale Real-time (RT) cyber-physical co-simulation environments to seamlessly integrate cyber-physical assets within a scalable remote access and experimentation platform. This eliminates the need for dedicated computational hardware, lowering operating system overheads and increasing the accessibility of critical research tools. This project operationalizes a federated and fully scalable research testbed that meets the requirements for real-life experimentation, specifically customized for power grid resiliency analysis.

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## KEY TAKEAWAYS

- Develops a framework for federating geographically and operationally diverse system assets within a unified research testbed
- Provides a user-friendly interface for accessing simulation toolkits
- Simplifies and advances collaboration between power grid resiliency researchers

## OUTCOME

This project develops a cutting-edge knowledge, resource, and toolset framework for near plug-and-play experimentation, facilitating collaboration and advancing power grid resiliency research. Through this platform, researchers will have access to, and be able to share resources with, the broader community to leverage investments between multiple researchers.

## PARTICIPANTS

## ROLE



The CREDC performs multidisciplinary research and development that focuses on the cybersecurity of energy delivery systems. The central project goal is to create an ecosystem where research results lead directly to the development of applications and methodologies, which are then validated in realistic contexts.



Lead institution; develops co-simulation federation framework enabling execution of a distributed experiment across testbeds.



Partner institution; serves as an endpoint for testbed co-simulation demonstrations and experiments.



Integrates their energy management system to the testbed



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## CONTACT INFORMATION

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This is a subproject sponsored by the CREDC academic consortium, led by the University of Illinois.

**CREDC Period of Performance:** October 2015 – May 2022

**CREDC Total Award Value:** \$28,099,258

DOE Share: \$22,476,290

Cost Share: \$5,622,968

### CYBERSECURITY FOR ENERGY DELIVERY SYSTEMS (CEDS)

CEDS projects are funded through DOE CESER, which aims to enhance the reliability and resilience of the nation's energy infrastructure by reducing the risk of energy disruptions due to cyberattacks.

Website: <https://www.energy.gov/ceser>

Date Written: June 2021