



CYBERSECURITY AND RESILIENCE

How confident are you that your company's cybersecurity is bullet-proof?

If your answer to that question is “not very,” you're not alone.

Securing the grid from cyberattacks is more complex than ever before. Highly networked business applications, distributed generation, and real-time data demands are just a few of the factors that are creating new points of entry for hackers. In this rapidly changing environment, concerns about cybersecurity can loom large.

While there is no shortage of vendors offering solutions, objective voices are hard to come by. That's why NREL established the Cyber-Physical Systems Security and Resilience R&D Center.

The center, located at NREL's Energy Systems Integration Facility, serves as an independent resource for utilities and energy-sector companies to test the security of new technologies and get a fresh set of eyes on organizational cybersecurity efforts from experts in the field.



How we can help

NREL's team provides companies with a clear, unbiased picture of their cybersecurity health—from the technologies, systems, and devices they use, to the workforce and business process best practices they have in place.

If problems are identified, NREL's team can create a customized plan to get things back on track. The plan is created using the most up-to-date industry standards and focuses on measurable, achievable progress. Actions are prioritized so limited cybersecurity budgets can be directed to where they will have the greatest impact.

Our services

Nine-Layer Security Testing

To stop a cyberattack before it starts, strike first.

NREL developed a secure testbed that emulates an end-to-end power and communication network of a typical distribution utility. The testbed is subjected to extensive penetration testing to explore how those networks hold up against the most sophisticated cyberattacks from internal and external sources.

The testbed incorporates a nine-layer security architecture (seven-layer OSI model + two upper layers of GridWise Architecture Council Stack) that is applicable to any multi-site information system in any industry that has real-time transactions between different actors (end users and/or systems).

“NREL’s cybersecurity team provided the coordination and facilities to perform meaningful cybersecurity tests in a live distributed grid environment. This was all accomplished working with multiple vendors, integrators, and a very condensed schedule. The experience and exposure has been invaluable to BlackRidge Technology. The lessons we learned, along with the other cybersecurity vendors, will provide a blueprint for others in the industry, saving testing time and costs, and will allow us all to better protect the nation’s distribution grid infrastructure.”

John Thuotte, Project Manager

BlackRidge Technology





Cybersecurity Road Mapping

Getting from where you are to where you want to be, without breaking the bank.

To keep up with the latest guidelines, CIOs have a library's-worth of cybersecurity documents to navigate through from government agencies, associations, academics, and vendors. Often these documents are rich in theory and lean on actionable advice. With limited funds and staff hours to invest in new a company's cybersecurity efforts, companies need to know that those investments will result in real progress.

NREL offers a cybersecurity assessment service designed to help companies maximize their cybersecurity efforts and dollars. Using a tool that draws on two of the best known and most respected security guidance documents in the electric sector, NREL's assessment gives immediate visibility into the maturity of a company's cybersecurity operations relative to industry standards. A customized road map is then created that identifies actionable items and prioritizes them so the company knows where to focus first.

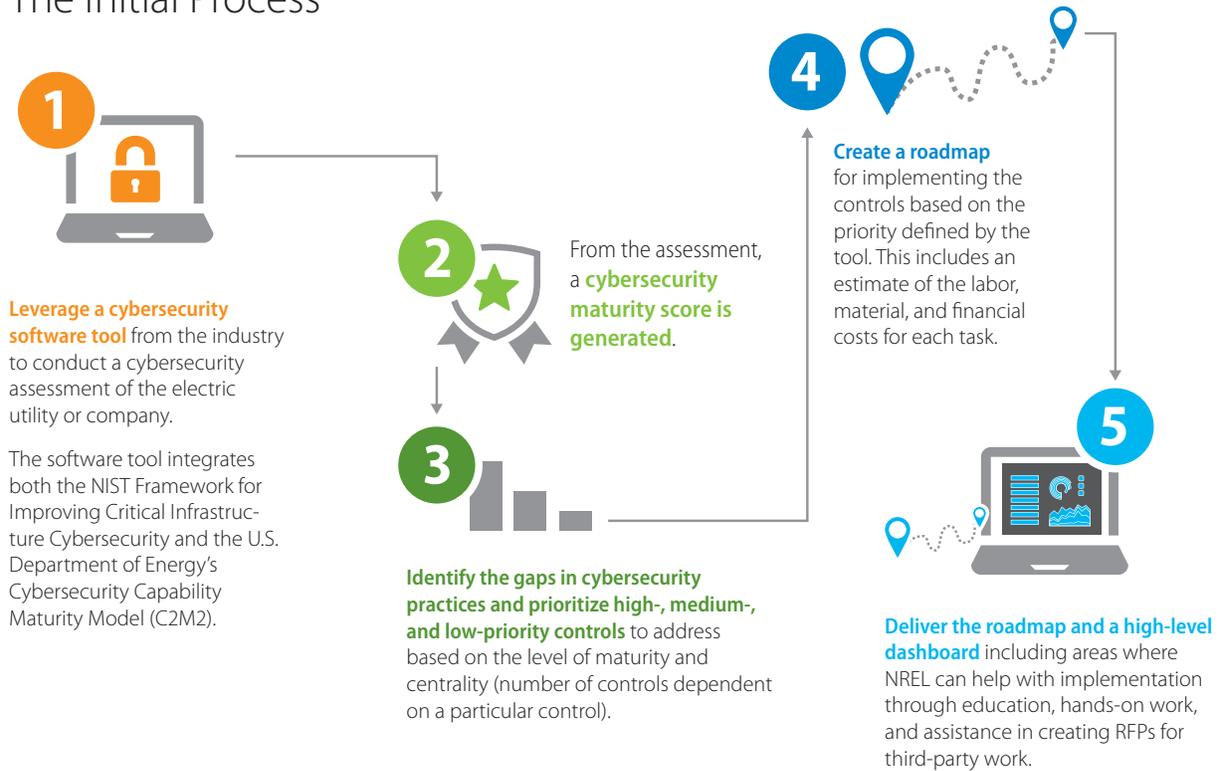
Additional Services

Building resilience at all levels—now and for the future.

- **Detailed software vulnerability scans for code under development and binary executables in use or in the implementation phase.** Any poor coding practices, malicious code, or back door features are identified and mitigating techniques are recommended.
- **Cybersecurity awareness training for technical and non-technical audiences.** Training is the best way to minimize vulnerabilities from social engineering tactics, phishing schemes, and inconsistent use of cybersecurity controls.
- **Enterprise-wide security architecture development.** Fortify your business with a set of standards-based security controls at the technology and business process levels.
- **Streamlining business units to maximize cybersecurity awareness.** Developing a new work flow process that supports the end-to-end security architecture and standards-based cybersecurity best practices is a powerful defense against cyberattacks.
- **Organizational training on new cybersecurity technologies and business processes.** Engaging and informing staff members through training helps ensure effective implementation.



The Initial Process



Our team

The cybersecurity center draws on a core staff with decades of practical field experience in power systems, cybersecurity, water/wastewater, renewable energy, and energy efficiency. The team's experience spans the entire spectrum from generation to end use, from strategic blueprints to operational data analytics, and from the boardroom to the operations center.

NREL's Energy Systems Integration Facility

The ESIF offers utilities, industry, manufacturers, universities, and other government laboratories access to an award-winning, state-of-the-art lab space and a team of specialized scientists and engineers to help move new technologies forward. Bring us your biggest energy system challenges and let's solve them together.



Getting started

The cybersecurity landscape can be difficult to navigate on your own. We're here to help. Tell us about your project or get more information by contacting us at 303-275-3887 or tami.reynolds@nrel.gov.



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