U.S. DEPARTMENT OF ENERGY | Office of Cybersecurity, Energy Security, and Emergency Response

Method to Quantify Relative Cyber Risk Reduction

Pacific Northwest NATIONAL LABORATORY

Reducing relative risk using the risk management tool

This project provides a capability to evaluate proposed cyber-risk reduction efforts and identify those risks that will result in the greatest relative reduction. This helps asset owners more confidently direct their limited resources to where they will provide the greatest benefit. The developed risk management tool (RMT) outlines the potential attack tree for system architectures and evaluates the relative risk reduction that could be achieved by the countermeasure being considered. Initial efforts have focused on electricity transmission substations. Current efforts are focused on extending the capability into generation and distribution in the electricity sub-sector and expanding the capability into the oil and natural gas sub-sectors. The project is also conducting additional research to enable the user to tailor selected parameters in the architecture and attack tree to more closely align with their environment. This will strengthen the link between the utilities' implemented architectures and the attack trees that form the foundation for RMT.

KEY TAKEAWAYS

- Develops metrics and methods to quantify cyber risk reduction
- Improves an organization's prioritization and cost benefit analysis processes
- Expands electric substation library and extends applicability into the oil and natural gas sectors

OUTCOME

The capability developed by this project enables utilities to determine the relative risk reduction that can be achieved from a set of proposed countermeasures and then to focus their limited resources where they will provide the greatest benefit. The current version of the risk management tool is being expanded beyond the electricity subsector and into the oil and natural gas subsectors. RMT has been piloted with five utilities: the Bonneville Power Administration, Dominion Energy, New York Power Authority, Western Area Power Administration, and Great River Energy. All five utilities have found the RMT to be beneficial during the demonstrations, have shown great interest in the tool, and have provided positive feedback in its development.

PARTICIPANTS	ROLE
Pacific Northwest NATIONAL LABORATORY	Research and development of the RMT
Dominion Energy®	Serves as advisor, validating substation architectures, attack tree parameters and alternate uses for RMT
Bonneville POWER ADMINISTRATION	Develops the substation architecture for the initial test of the RMT concepts and provides input on attack tree parameters

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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

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