Cybersecurity: A System Operations Training Perspective

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Our electric system is undergoing a dramatic transformation resulting in countless challenges in planning, operations, and maintenance. The complexity and challenges of operating the grid continues to test our systems as well as the performance of our system operators.

Among the many changes, roles, and responsibilities our system operators must deal with to reliably operate an efficient and increasingly complicated distribution system, cybersecurity concerns have managed to work their way to the top of the list.

The recent cyberattacks on the Ukraine electric system add to the ever-growing list of cybersecurity concerns of system operations and the technology currently being applied to these systems. According to Rocky Sease, Owner and CEO of SOS Intl (SOS), “These attacks demonstrate the vulnerability of our essential public systems, including power and water utilities, transportation systems, and communications networks. Power grids are an obvious target for bad actors who want to negatively impact many people, especially in a world grown dependent on a vast array of electronic gadgets.”
There are currently an estimated 55,000 power plant, transmission, and distribution system operators employed in North America. This includes approximately 6,700 NERC-certified system operators holding jobs as Reliability Coordinators, Balancing Authorities, and Transmission Operators. Research estimates one third to one half of these system operators could retire over the next five years, leaving an unprecedented number of vacancies to be filled.

“We must consider how to best train incoming system operators to be successful at recognizing and responding to potential cyberattacks as they monitor the operations in control rooms 365 days a year, 24 hours a day,” shared Sease. What should this training look like to be considered effective? According to Sease, for optimum results, the training should be interactive and mimic real-time operations. And, not surprisingly, the training should require collaboration among the system operators and the IT staff at the utilities.

The SOS, SANS Institute, and WSC, Inc. alliance listened to the requests of the utility industry and are developing an intensive, interactive simulation training that accurately represents the rapidly changing power grid. This simulation training incorporates scenarios that pose potential cybersecurity breaches to help system operators recognize and then respond to any potential events. The specialized, state-of-the-art training is designed for interface among real-time operations, system operators, and IT staff and has been widely requested throughout North America and abroad.

“We’ve observed, from working across many entities, that operators know what to do when their system is failing; cyber operators and support personnel, including IT professionals, know what to do when the technology is failing. However, very few of these professionals know what to do when their system is operational and being misused against them,” explained Sease.

There is a need for focused cybersecurity training for generation, transmission, and distribution system operators. Our operators are aware of the cyber events in the Ukraine and there is a desire and hunger for specific cyber training from the operators at all levels including generation, transmission, and distribution.

Sease went on to say that it’s time for the electric industry to consider a similar path for system operators that was taken for NERC system operator certification and credentialing. This includes supporting the necessary tools, technology, and
specialized training directly relied upon by the system operators for real-time job tasks. System operator credentialing and continuing education is essential and should also be addressed for cybersecurity operators.

“Even though the laws of physics remain the same, training the system operators of tomorrow looks very different from training the system operators of today. Leveraging cybersecurity technology with simulation training will be the solution to many of the challenges our system operators will certainly face in the future,” explained Sease.

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SOS, Intl –

SOS is a leading provider of training and consulting for the power industry. SOS helps utilities manage risk and ensures reliability by offering instructor-led and online courses accompanied with state-of-the art computer simulation for distribution, transmission, and generation. Using the Systematic Approach to Training, SOS designs and delivers training required by NERC, and rigorously tracks and interprets NERC Reliability Standards for System Operations. Headquartered in Charlotte, NC since 2002, SOS has provided NERC approved continuing education and compliance services to thousands of employees operating the Bulk Electric System across the United States and Canada.