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SCADA Systems

SCADA systems are defined as Supervisory control and data acquisition systems. SCADA systems are used to control and monitor critical infrastructure, it is used to record the changes in a system that has set conditions. There is a human machine interface that allows for the information to be processed by a human operator. SCADA systems reduce the risk surrounding control systems.

SCADA Systems

SCADA systems are “a combination of hardware and software that enables industrial process automation by capturing real time data” (Wangsness, 2023). These are centralized systems that monitor infrastructure sites which allows for any changes in these critical infrastructures to be recorded and analyzed by humans. This allows companies to rely on technology to capture and analyze data in real-time without humans having to be at the location. Supervising employees in remote locations can then make changes to adjust the normal controls of the system. Allowing for employees to be in a different location from these infrastructures is also safer in case any of these systems become unsafe, humans don’t have to be around in those conditions.

SCADA Systems require Remote Terminal Units (RTUs) to monitor and collect data used to communicate with the central system. It is common for RTUs to use ethernet connected to a cellular network to transmit data to remote employees. Human Machine Interface (HMI) provides information digestible to humans. SCADA systems use a variety of communication techniques,

including ethernet and wireless networks to transmit data from the infrastructure to the humans who analyze it.

Examples of SCADA Systems

SCADA systems are used in the oil and gas industry, allowing for companies to be informed about tank levels, temperature, pressure, and flow without having to physically be there. This is once again helpful because in the oil and gas industry conditions can become unsafe in many instances, but SCADA systems allow for employees to manage those conditions without being physically present at the site.

SCADA systems are also used for water treatment and management. It sends information to human supervisors that shows if the water levels are unsafe to be used in communities. This allows for those supervisors to alert the people in the communities and adjust chemicals, pressure, and flow rates conditions to ensure the safety of people using the water.

Security Issues

SCADA systems are used on critical infrastructure, and technology is used to ensure the infrastructure's system is balanced. Anywhere technology is used, there is a cyber risk. With SCADA systems, there is an increased cyber risk because they are used on critical infrastructure, so security is extremely important. Two of the biggest threats are unauthorized access and packet control protocols. Unauthorized access is always a security risk, especially with critical infrastructure, because they could tamper with that infrastructure. For example, if someone had unauthorized access to the water treatment and management systems, they could tamper with the chemical composition and make the water unusable. The packet control protocols "there remains less or no security on actual packet control protocol" (*SCADA Systems*, n.d.). One of the better ways to combat this problem is using a VPN and firewalls for SCADA networks.

Conclusion

In conclusion, SCADA systems help humans to supervise critical infrastructure from afar to control and monitor systems. It records the changes these systems make and allows for changes to be made remotely to ensure worker safety and safety to the community impacted by the SCADA system. There are security issues that come along with SCADA systems because they control critical infrastructure through technology, but they are countered by security protocols, VPNs and firewalls.

References

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