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SCADA Systems

BLUF: SCADA is short for Supervisory Control and Data Acquisition and is used to help control and monitor critical infrastructure such as water systems, gas pipelines, energy and electricity, and wastewater systems. Critical infrastructure comes with a lot of vulnerabilities that can lead to catastrophic consequences if left unintended, and with the help of SCADA systems, these vulnerabilities can be addressed and help prevent any threats that can otherwise lead to the disruption of normal societal activity.

Critical Infrastructure Vulnerabilities

Critical infrastructure are the systems that help maintain the functionality of a society, such as water systems, electricity, transportation systems, etc. One of the main vulnerabilities that are associated with critical infrastructure are cyberattacks. Critical infrastructure in the modern era is usually maintained via computer systems that can often come with software vulnerabilities. Having outdated systems and security protocols or insufficient maintenance on these systems can lead to a higher chance of attacks and operational failures (Noya). Critical infrastructure can also be vulnerable to natural disasters that can disrupt normal system operations when they occur and cause immense damage, such as heavy winds bringing down power lines and causing no electricity to run through the city.

How Do SCADA Systems Help Mitigate Risk?

SCADA systems can help monitor critical infrastructure operations in real-time and detect any abnormalities that occur. Detecting abnormalities within the system can allow operators to respond quickly and address abnormalities as soon as possible before severe damage can take place. Being able to collect real-time data on systems ensures that the systems are operating efficiently and help provide valuable insights into performance trends (SCADA). A Human Machine Interface, or HMI, provides information to human operators on machine operations which can help monitor the SCADA system's databases, such as ensuring that a water pump is running efficiently by monitoring the flow rate of the fluid (SCADA Article).

Conclusion

Overall, critical infrastructure consists of essential necessities within a city, such as water, electricity, gas, and transportation. Since these systems are vital to a city's functionality and well-being, it is essential that they are well-protected to a high degree. They often come with vulnerabilities such as cyberattacks, natural disasters, and operational failures that can threaten the stability of a city. SCADA systems help mitigate these risks by providing real-time monitoring and control over these systems that can help address vulnerabilities before they escalate into a threat or an attack.

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