Brandon Norton

CYSE 200T

March 28, 2025

Professor Duvall

SCADA Systems – An Important, but Vulnerable Necessity

BLUF: SCADA systems are a necessity in managing and automating our industrial systems; failing to protect them can have a negative impact on thousands to millions of people.

What is SCADA?

SCADA, or Supervisory Control and Data Acquisition, systems are tools used every day all over the planet to manage a wide variety of industrial programs. This can be anything from energy generation to water treatment facilities, to manufacturing plants. The systems use a variety of sensors and remote-control units to allow humans to manage and monitor incredibly expensive facilities/plants/equipment from a central location. These systems are critical as it is infeasible for humans to complete every task that these systems do, like data acquisition, or traveling to every location across the globe to manage the systems in-person.

Vulnerabilities with SCADA

SCADA systems are susceptible to many vulnerabilities. Many of the hardware that these systems manage is incredibly expensive and complex and old. These older systems (also called ‘legacy systems’) were not designed with cybersecurity in mind. These systems have glaring vulnerabilities that have to be later patched out or remedied/managed, leaving a lot of the legwork on the human element. A bad-faith actor could exploit these vulnerabilities and cause millions, if not billions, of dollars in damage. “Unfortunately, based on the continued reports received by Trend Micro Zero Day Initiative (ZDI), vulnerabilities have been and will likely continue to plague SCADA systems for some time” (Trend Micro).

Importance of SCADA

While SCADA systems have some glaring vulnerabilities, they are still critical to our infrastructure. These systems allow real-time monitoring, alerts, and data collection for thousands of locations across the globe (Paul, C), increasing their efficiency by a ludicrous percentage. If these systems were not put into place, these legacy systems would be defenseless against an onslaught of cyberattacks, which would cripple infrastructure globally.

Conclusion

It may be easy to highlight the vulnerabilities of SCADA systems and think about them in a bad light, but the alternative of not using them is significantly worse. Human ingenuity protects these systems for the greater good, so that our critical infrastructure stays secure and functional, leading us to having better, safer, and more efficient/productive lifestyles. Without SCADA systems, we would be subject to frequent outages, manufacturing shortages, with more expensive goods/services.

**Paul, C. (2020, December 6).** Using SCADA to protect critical infrastructure and systems. *Old Dominion University*. Retrieved March 28, 2025, from <https://sites.wp.odu.edu/cyberpaul/2020/12/06/using-scada-to-protect-critical-infrastructure-and-systems/>

**Trend Micro. (2019, December 16).** One flaw too many: Vulnerabilities in SCADA systems. *Trend Micro*. Retrieved March 28, 2025, from <https://www.trendmicro.com/vinfo/us/security/news/vulnerabilities-and-exploits/one-flaw-too-many-vulnerabilities-in-scada-systems>