

Power System Cyber Security Risk in the Era of Digital Transformation

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Abstract : Power systems digitization solutions provides a comprehensive smart, cohesive, interconnected network, extensive connectivity between digital assets, physical power plants, and resources to form digital economies. However, digitization has exposed the classical air gapped power plants to the rapid spread of cyber threats and attacks in the process delaying and forcing many organizations to rethink their cyber security policies and standards before they can augment their operation the new advanced digital devices. Cyber Security requirements for power systems (and industry control systems therein) demand a new approach, unique methodology, and design process that is completely different to Cyber Security measures designed for the IT systems. In practice, Cyber Security strategy, as applied to power systems, tends to be closely aligned to those measures applied for IT system purposes. The differentiator for Cyber Security in terms of power systems are the physical assets and applications used, alongside the ever-growing rate of expansion within the industry controls sector (in comparison to the relatively saturated growth observed for corporate IT systems). These factors increase the magnitude of the cyber security risk within such systems. The introduction of smart devices and sensors along the grid initiate vulnerable entry points to the systems. Every installed Smart Meter is a target; the way these devices communicate with each other may instigate a Denial of Service (DoS) and Distributed Denial of Service (DDoS) attack. Attacking one sensor or meter has the potential to propagate itself throughout the power grid reaching the IT network, where it may manifest itself as a malware infiltration.

Keywords : supply chain, cybersecurity, maturity model, risk, smart grid

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