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Identifying and Mitigating Industrial Control System Vulnerabilities

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Although a recent MIT paper introducing the concept of cybersafety is not light reading, it is must reading for anyone serious about industrial control system cyber security. In their working paper A System-theoretic Approach to Identify Cyber-vulnerabilities & Mitigations in Industrial Control Systems, MIT professors Shaharyar Khan and Stuart Madnick move the discussion of how to prevent physical damage to process systems away from firewalls and OT networking to the control system itself where, of course, it should be. They do so by presenting an in-depth analysis of an actual system, providing a step-by-step approach to a holistic cyber security analysis that can be emulated and scaled to analyze large systems with many interdependent subsystems. The authors conclude with an analogy to the human body,

“...just as it is impossible to avoid all contact with infections and never catch a disease, it is impossible for an industrial control system to be under constant attack and never have its network defenses breached. Therefore, the system has to be designed so that it is resilient against the effects of the attack ...”

Read the full paper here.