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Cybersecurity Experiment Design with Stochastic Game Theory

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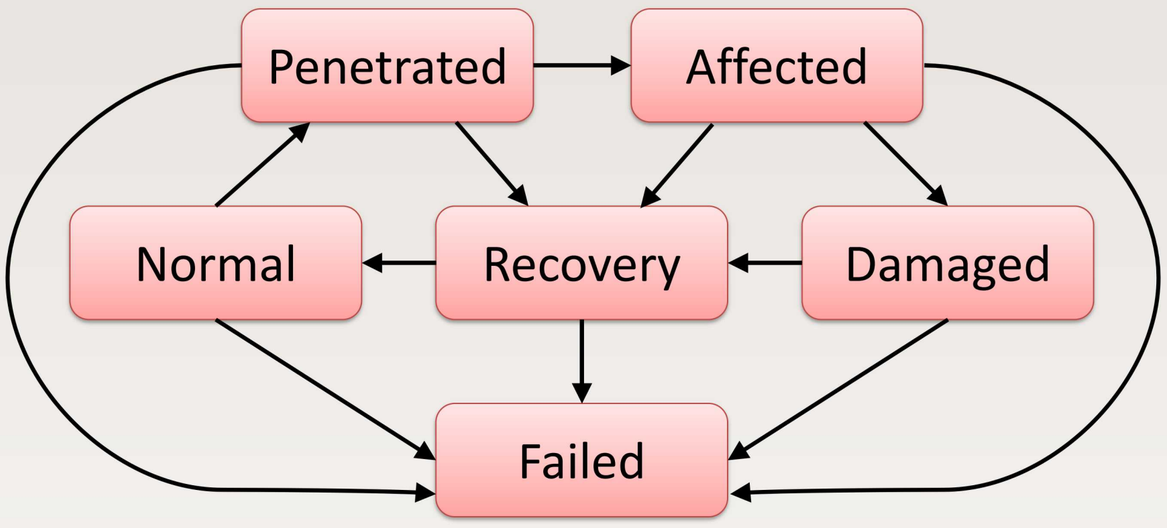
Introduction

The purpose of this research is to design an experiment that evaluates the efficacy of cybersecurity controls for industrial control systems. If this research is successful, we will be able to do the following:

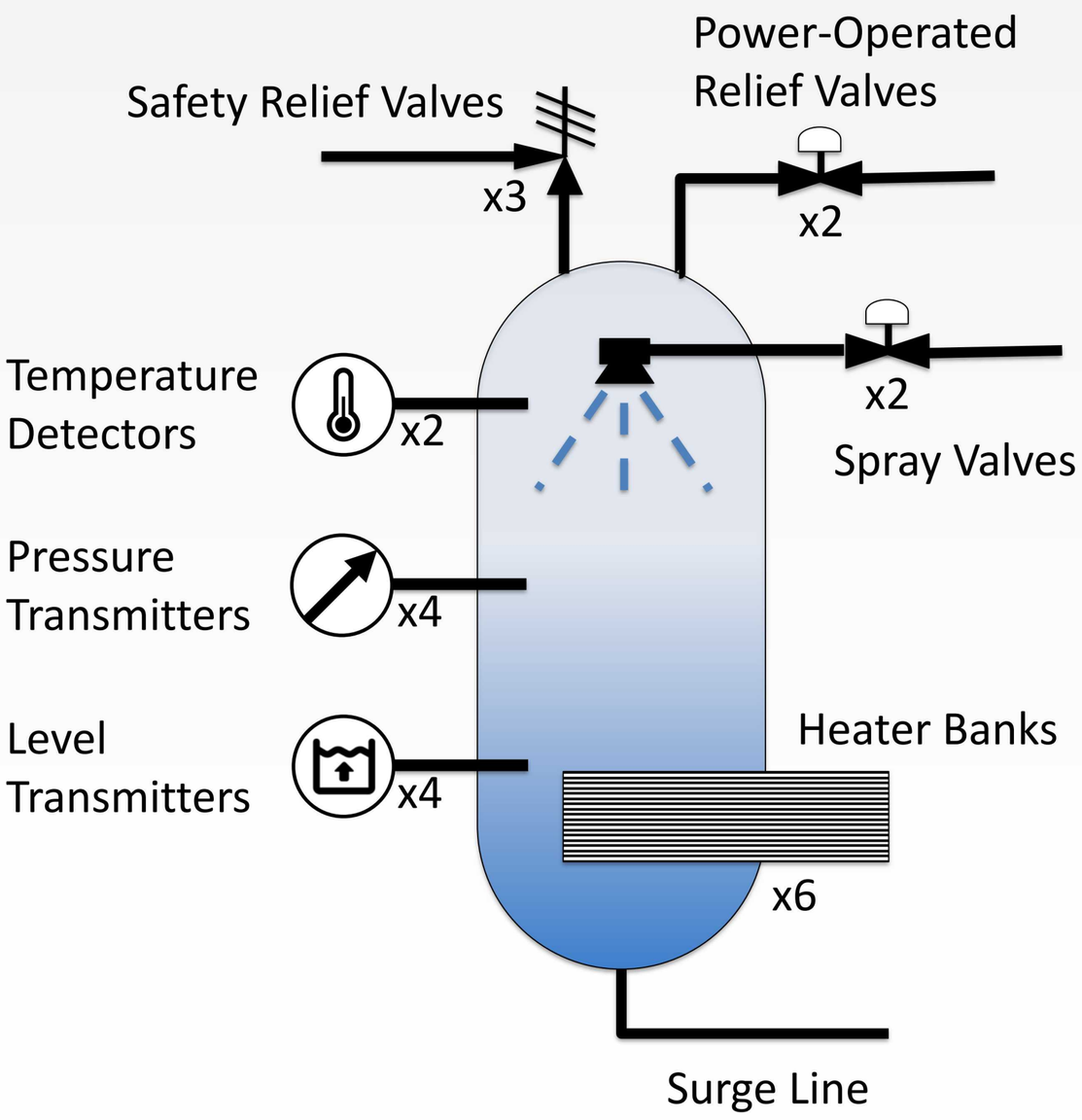
- Prioritize defense methods
- Defend against multiple threats
- Predict system performance

Stochastic Game Theory

Strategies chosen by a defender and attackers determine the probability of transitioning to another security state.
(Lalropuia and Gupta, Rel. Eng. & Sys. Saf., 2019)

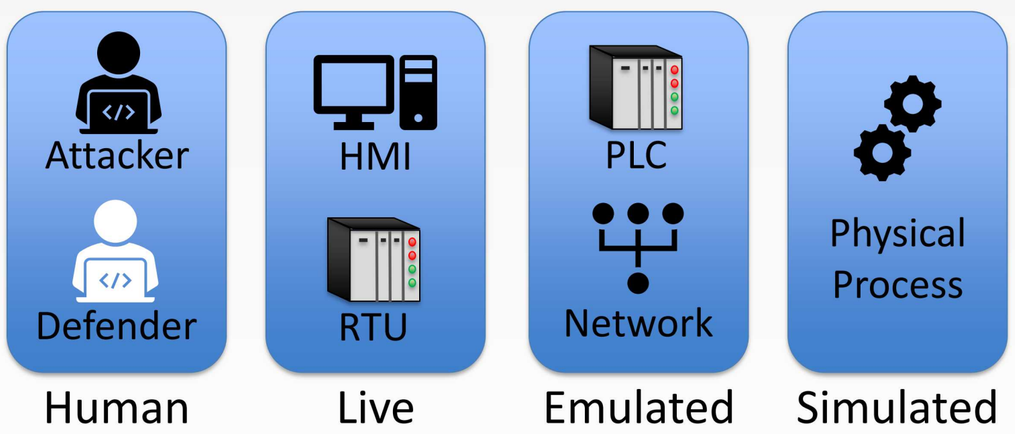


Candidate Pressurizer System



SCEPTRE Testbed

The SCEPTRE platform provides experimental data on security events and state transitions.



This method enables:

- Consideration of resources required for cybersecurity controls
- Analysis of process logic
- Research of malware effects on industrial control systems

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