ICS Asia Pacific Summit 2020

ICS Attack Concepts and Demonstrations

Tim Conway

– SANS Institute

– Instructor

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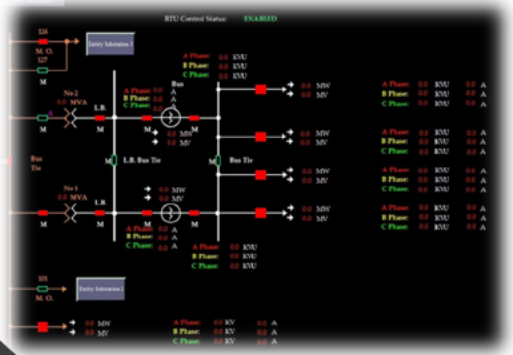
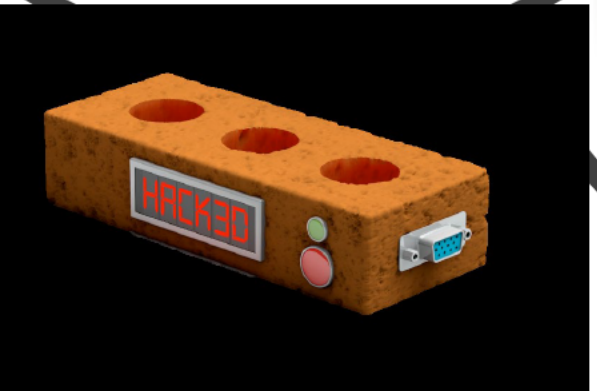
– SANS Institute

– Instructor

Agenda

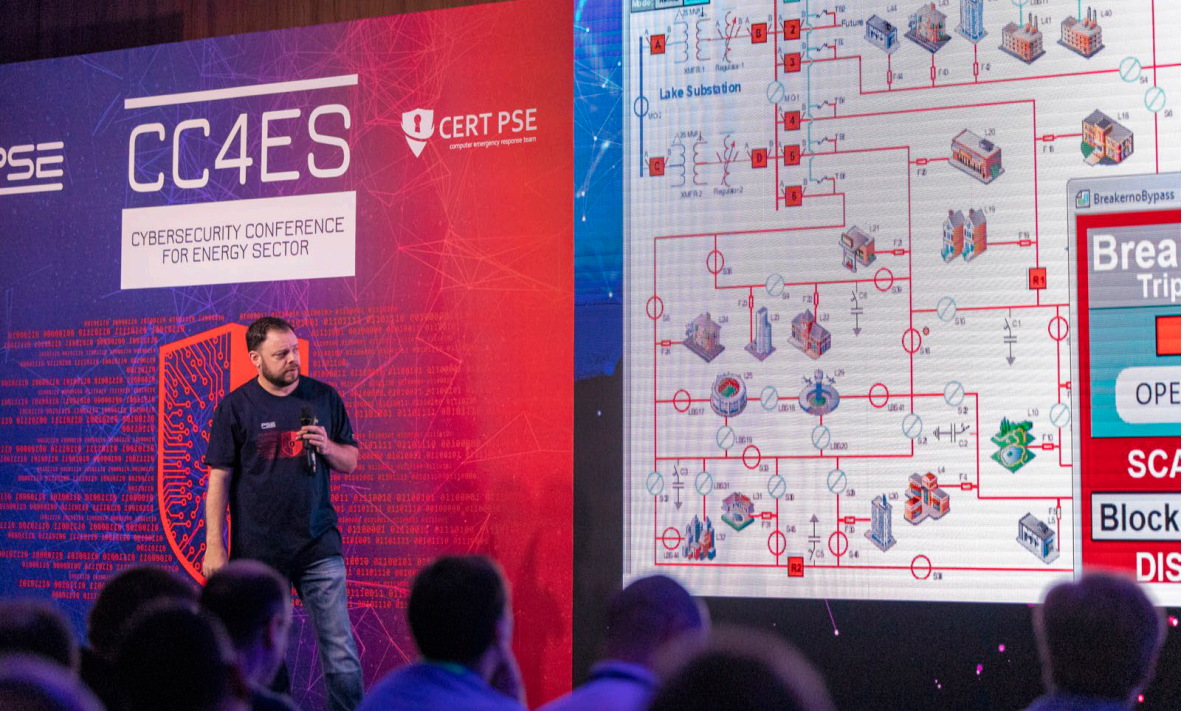

Learning Objectives
Assumed Breach
Network based attacks
Controller attacks
Now what?





GRID NETWARS

sans.org/netwars/grid


CC4ES
CYBERSECURITY CONFERENCE
FOR ENERGY SECTOR
CERT PSE
computer emergency response team
Lake Substation
BreakernoBypass


GRID
NETWARS

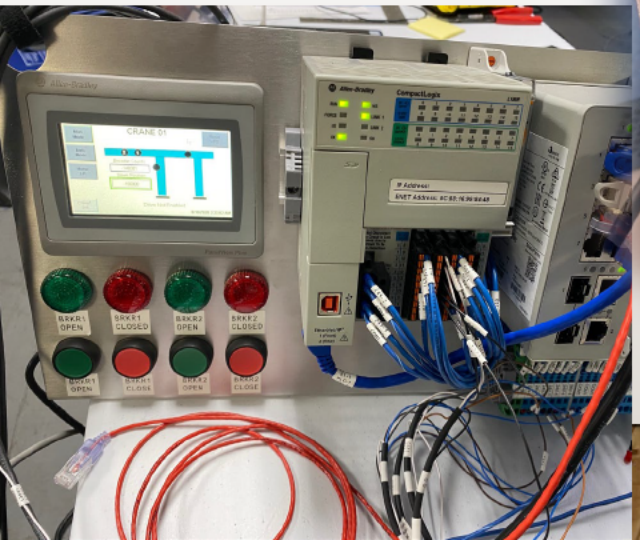

Individual Players

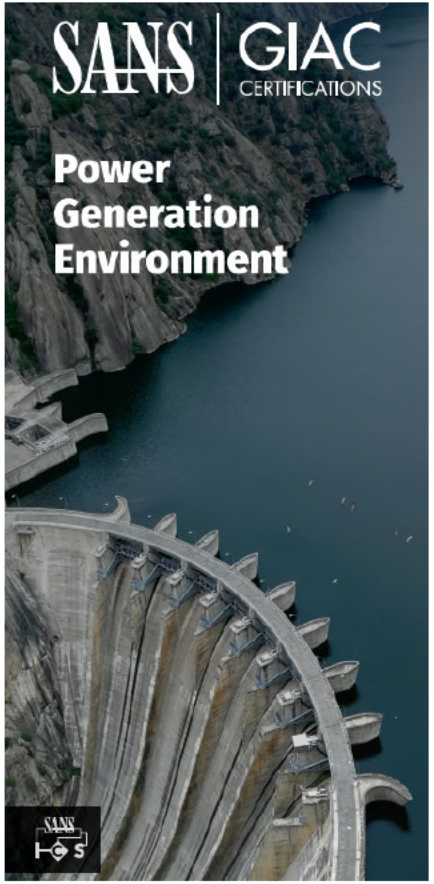
SANS | GIAC CERTIFICATIONS

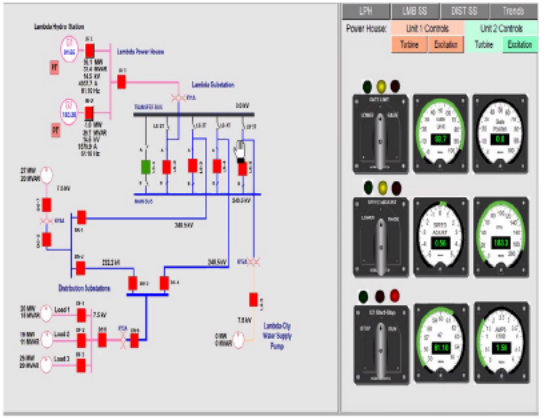
Manufacturing Environment


Positions
Run Trolley To Pos 1
On
Run Trolley To Pos 2
On
Operations Have Been Ransomed
Pay Our Demands
Cancel Exit
Main
WARNING
marathon
Motors
SyMAX


Port and Shipping Environment

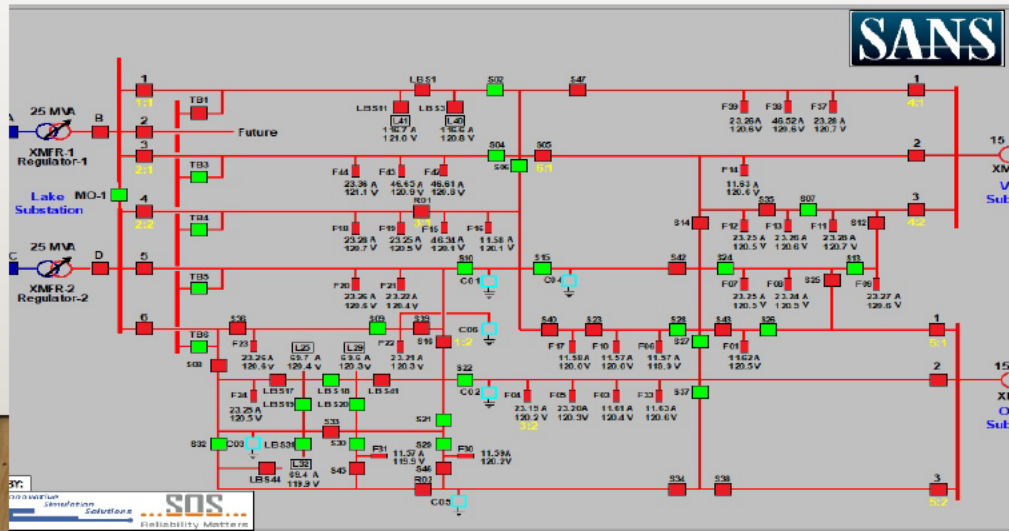



SANS
GIAC
CERTIFICATIONS
Power
Generation
Environment



SANS | GIAC CERTIFICATIONS

Power Distribution Environment



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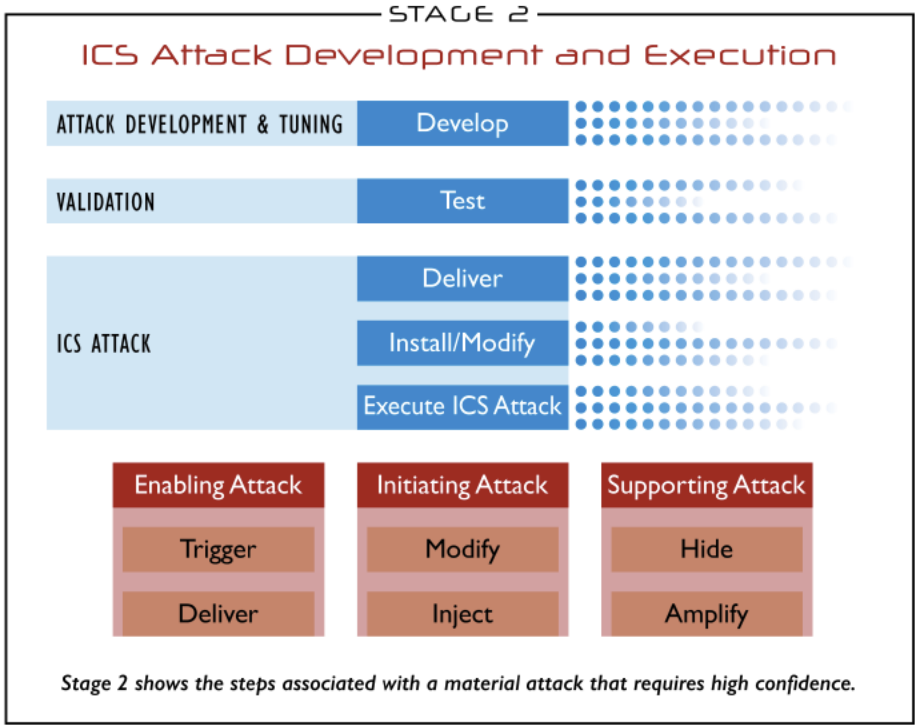
Killing the Kill Chain



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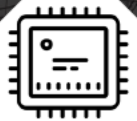

Controller attacks

Now what?

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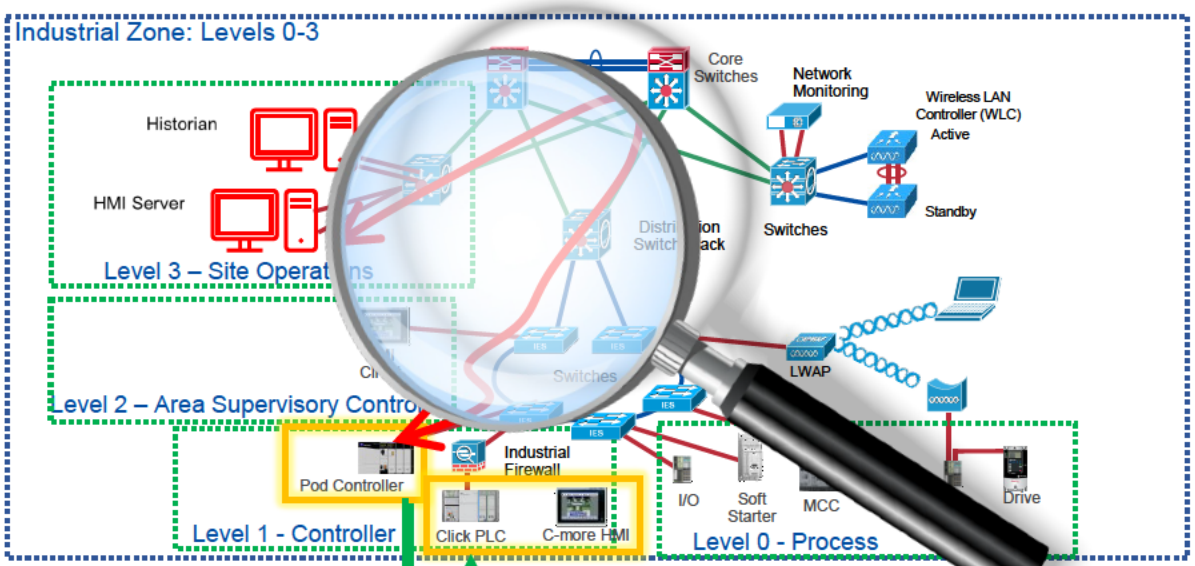
Now what?

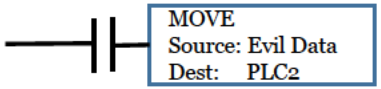
Assumed Breach

Controller attacks

We Focus on Computer to PLC & I/O For Calibration, But Not a Weaponized PLC



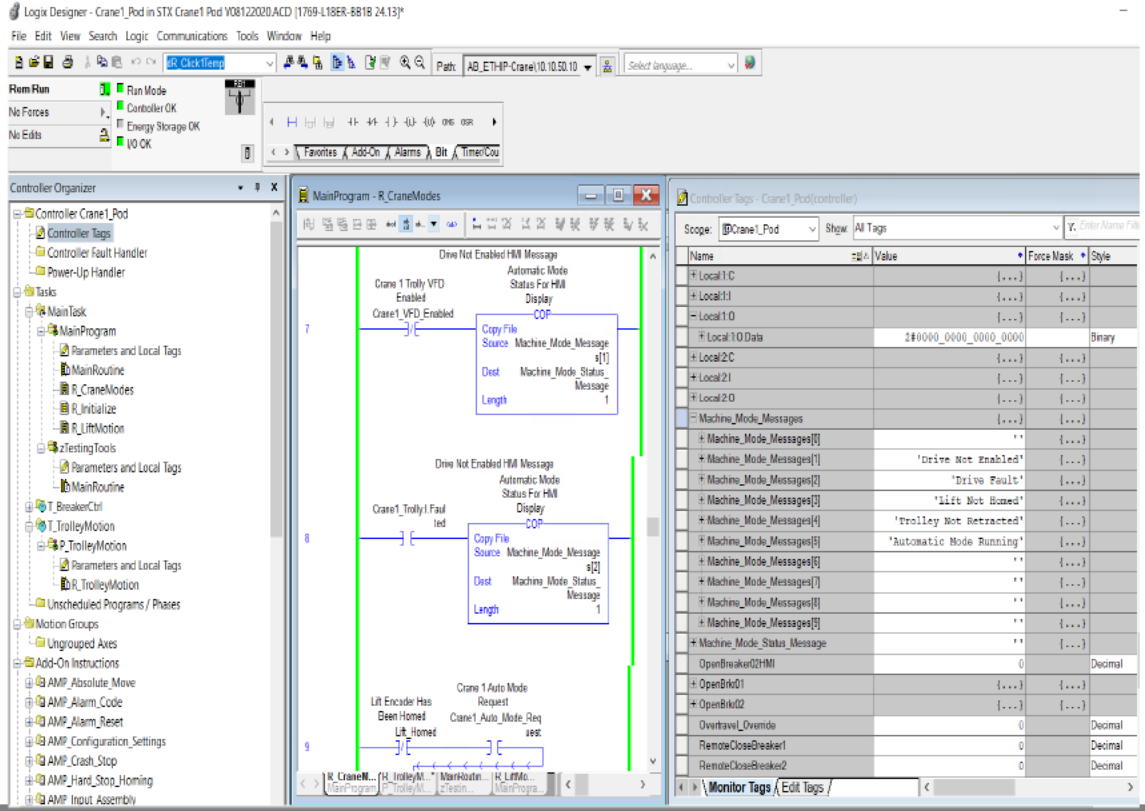
PLC1



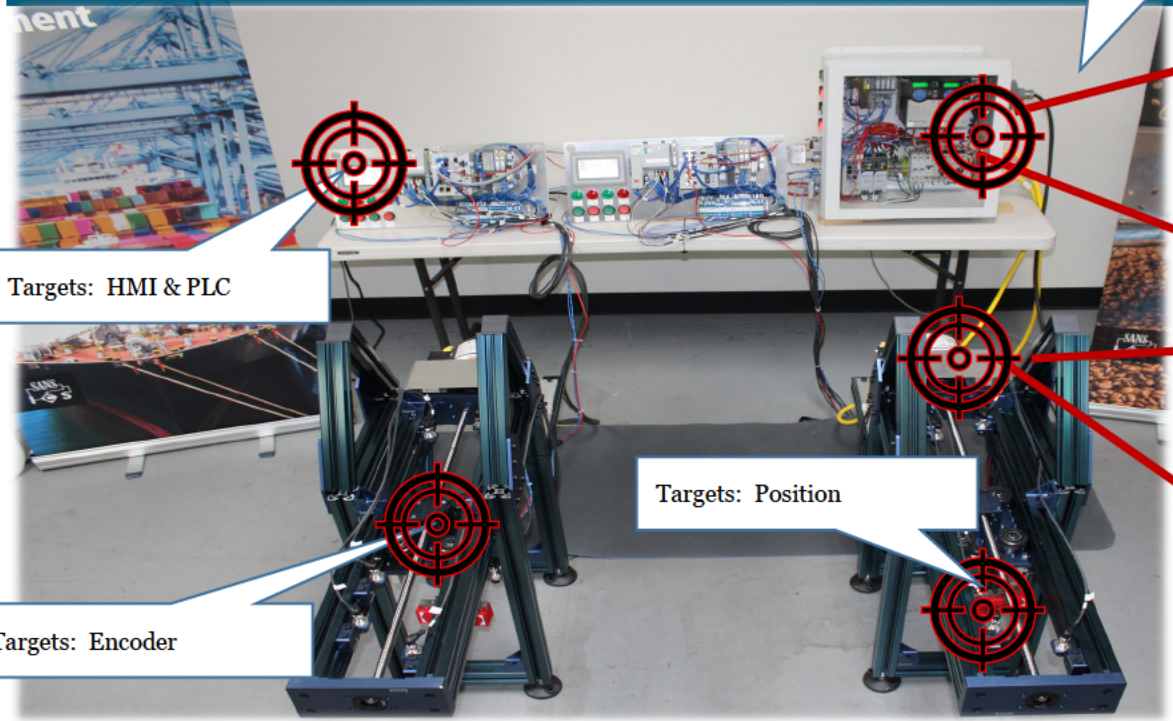
PLC2

It's Challenging to Harden a PLC

- Deep Packet Inspection (DPI) for real time communications not understood and inline processing isn't fast enough
- Understand critical parameters that are targets
- Boundary Check the data before use
  - Usually done in the HMI to trust a passed value is withing range

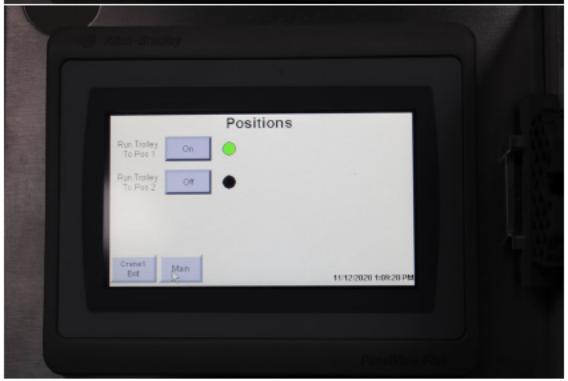


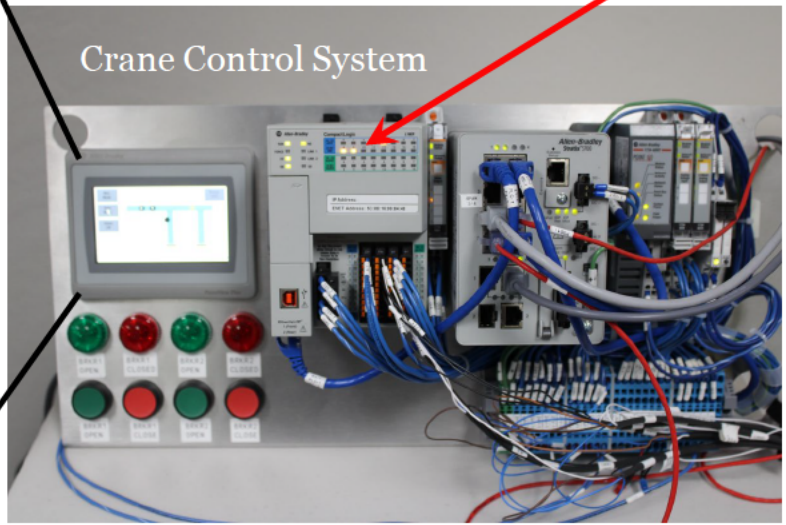
The Ship to Shore Crane Environment



Controller Delivers the Attack(s)

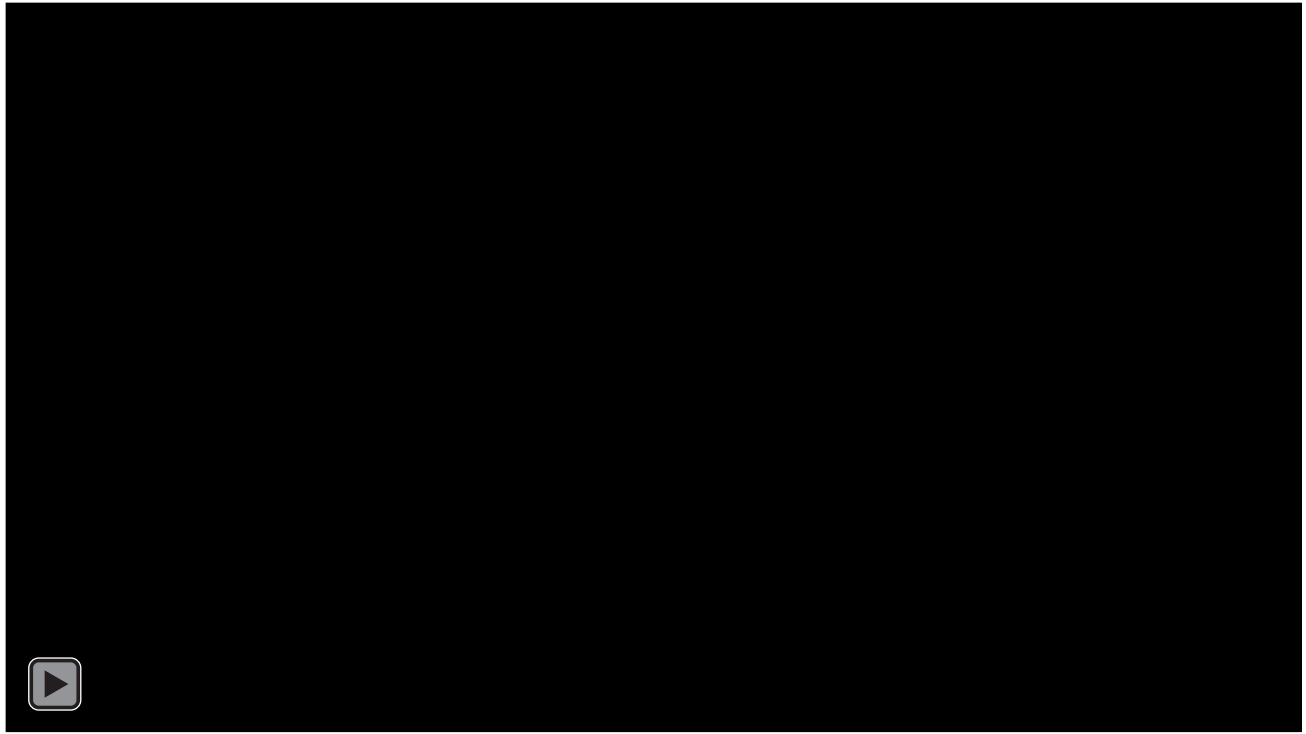
Rogue Control System





Ship To Shore Crane – Normal Operation

- Two Programmable Trolley Ship Positions
- One Trolley Shore Position
- Programmable Up and Down Positions



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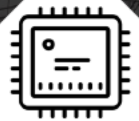
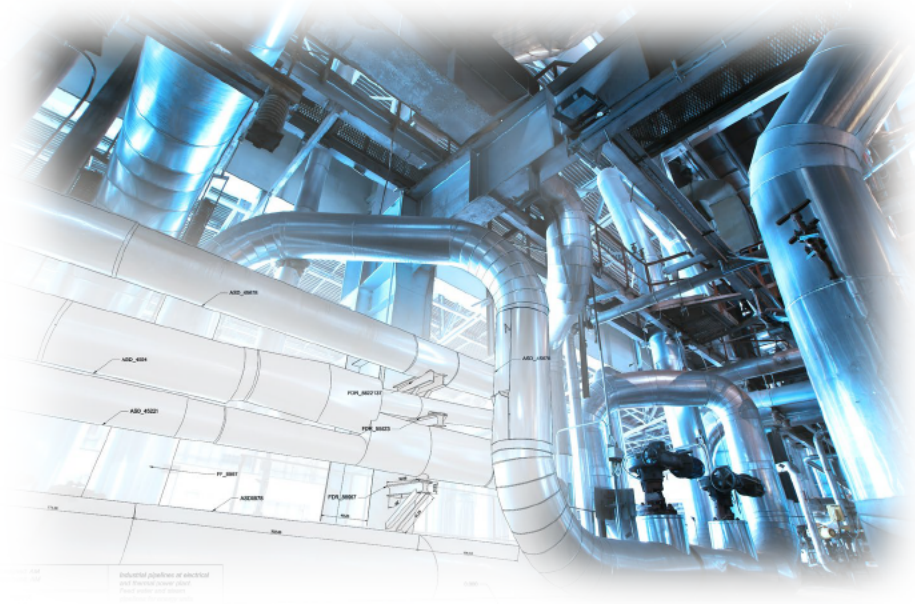


Controller attacks

Now what?

Now What?

- Gain visibility inside your ICS environments
- Develop an understanding of what normal looks like
- Look for bad and operationalize a response approach
- Ensure capabilities exist to validate logic and recover known good logic
- Engineering driven boundary checking within the logic



RESOURCES AND CONTACT INFORMATION

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