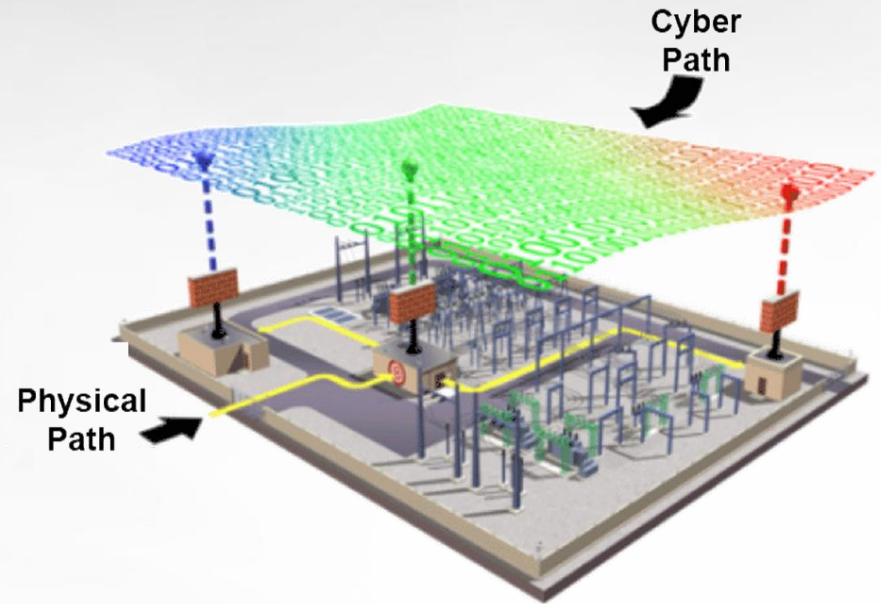




PACRAT

The Blended Physical and Cyber Risk Analysis Tool



PRESENTED BY DOUG MACDONALD
PACIFIC NORTHWEST NATIONAL LABORATORY

Historically, physical protection systems have been isolated from any external connections

Over the years, electronic connections have become more prevalent

- ▶ Requirement for the common credential
- ▶ Automation
- ▶ Remote monitoring and control
- ▶ System updates pushed to equipment

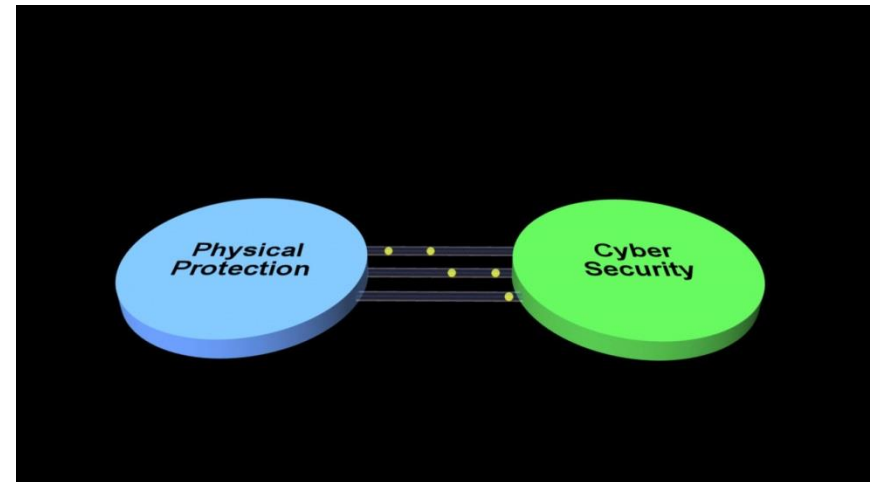


Not properly identifying these vulnerabilities can have ***catastrophic consequences***

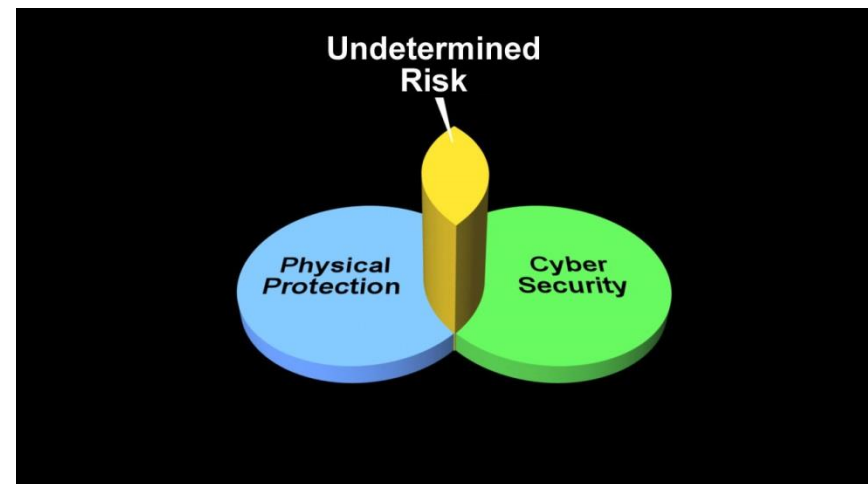
How bad can it be?



- ▶ Most ***physical protection vulnerability assessments*** and ***cyber security analysis*** are performed in an independent or stove piped manner, and don't account for ***system level interactions or interdependencies***
- ▶ This provides a ***segmented*** or ***incomplete*** picture of the overall risk to an asset



- ▶ Fully evaluate the ***physical protection domain*** and the ***cyber security domain*** together to understand the ***overall performance*** of the protection measures in place
- ▶ ***Identify*** and ***quantify*** the areas of undetermined risk



Our blended approach meets that need

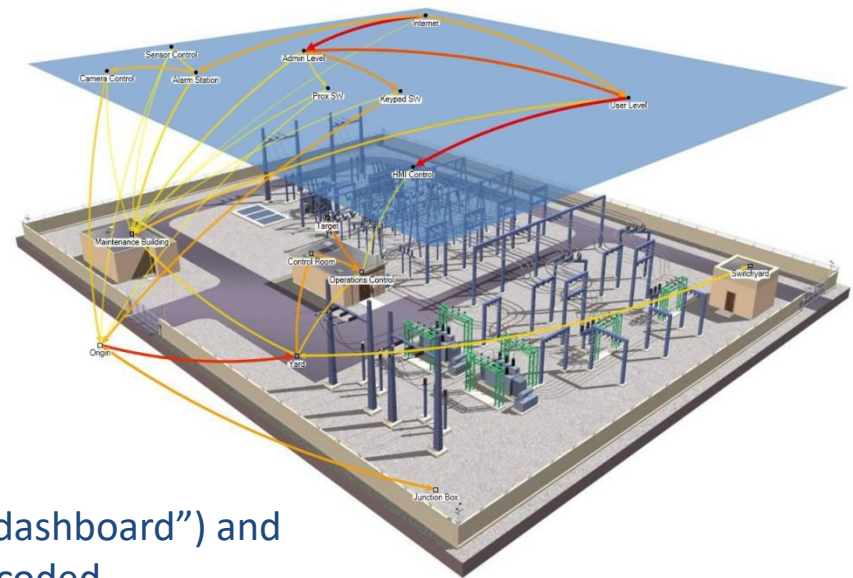
- ▶ Experienced subject matter experts, are cross trained in the **process** and **methodology** domains for
 - Terminology (a common language)
 - Timely detection methodology
 - Experiences
- ▶ The team modified the approach to evaluate **every avenue of approach** using both **electronic** and **physical** pathways

Our blended approach meets that need

- ▶ Real-world assessment
 - Team of 10 SMEs
 - Scope was the entire system
 - Had just completed a comprehensive assessment
 - Several areas of concern based on the cyber/physical interplay

- ▶ Lessons Learned were incorporated to provide
 - A comprehensive **vulnerability assessment** and **risk analysis** tool
 - Elements like the ability to capture and quantify system level interdependencies and interactions
 - A “backtracking” capability

- ▶ Each of these elements are needed to properly assess the overall protection strategy and **identify the true risk to an asset**
- ▶ The ability to **focus** on the objective and **“tune”** the tool

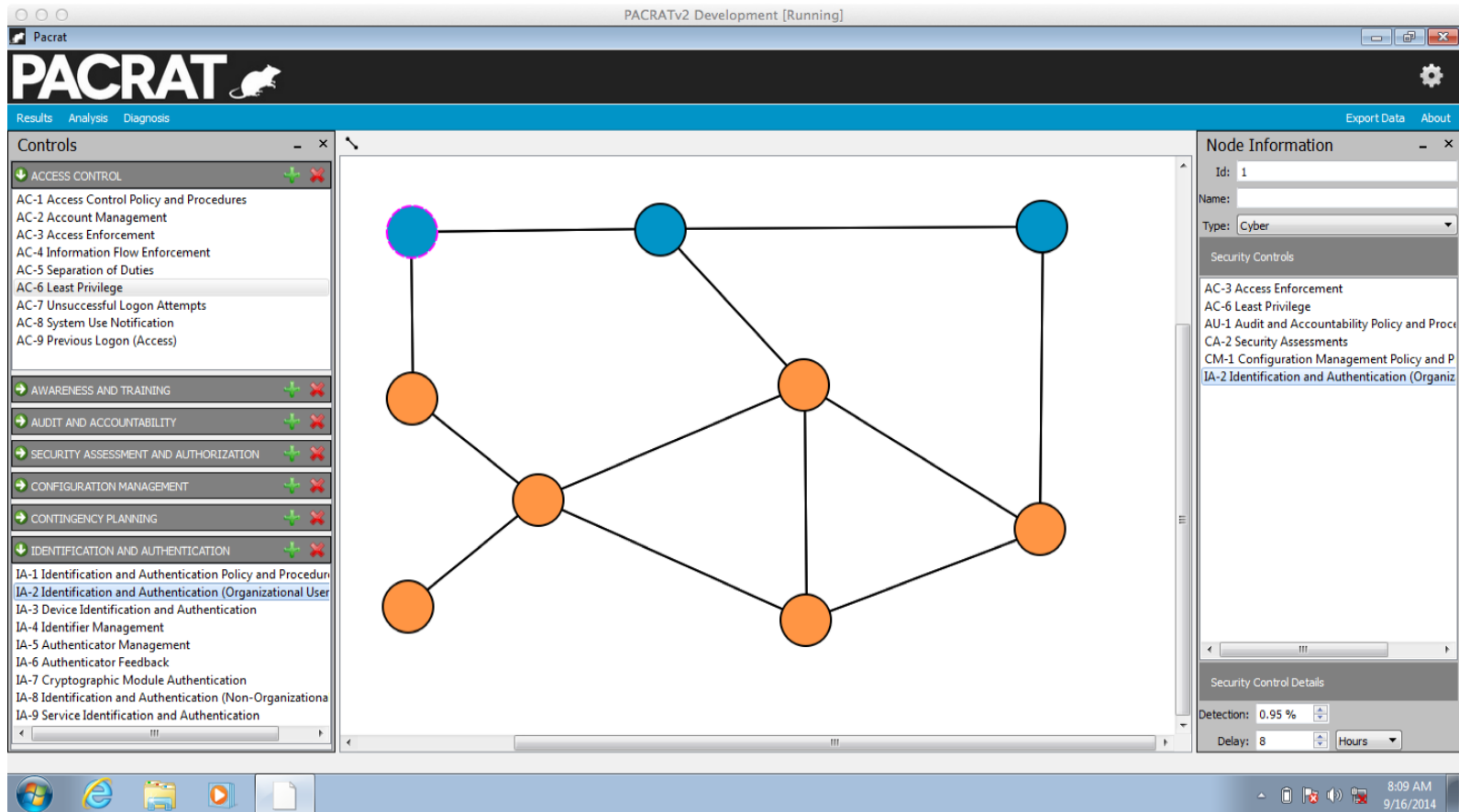


PACRAT's User Interface (the “dashboard”) and the output display (with color coded, statistical pathway analysis)

PACRAT

Physical And Cyber Risk Analysis Tool

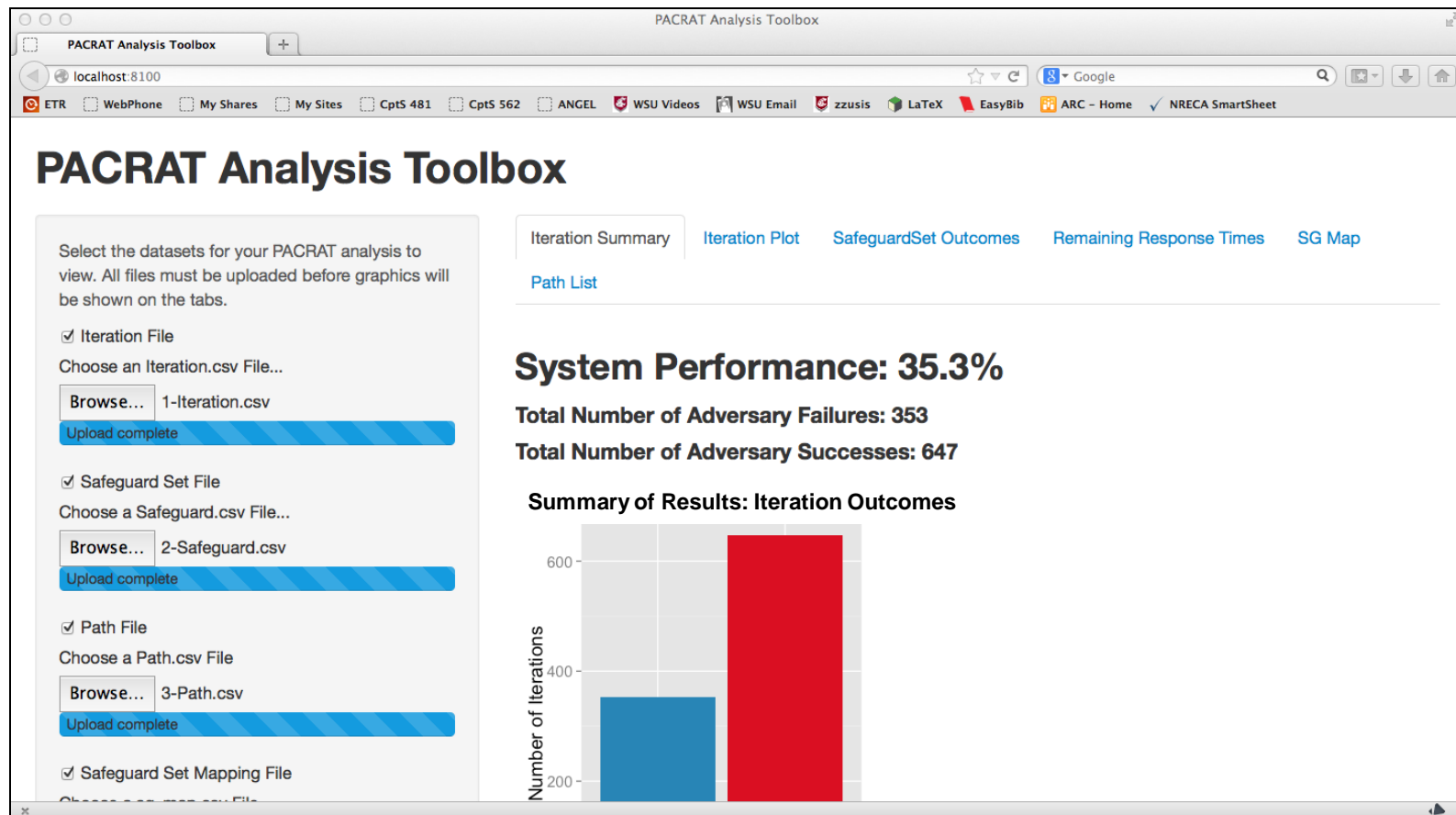
► User Interface to build the model



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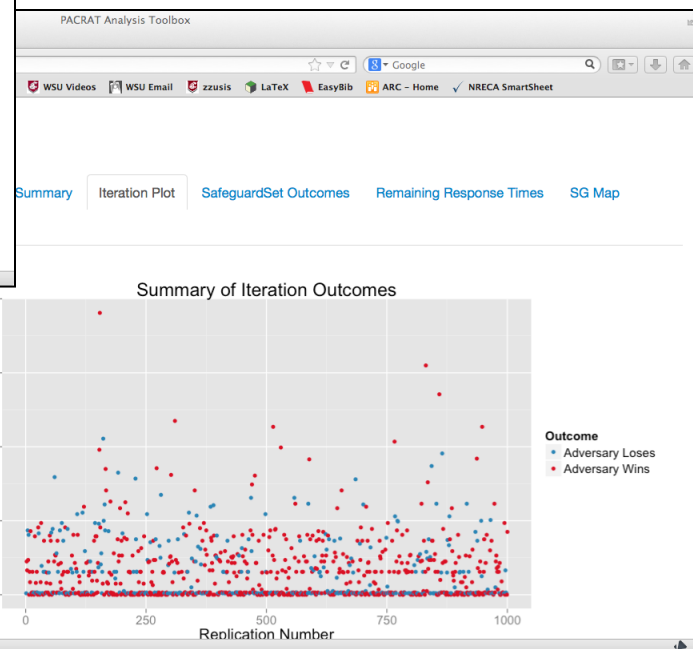
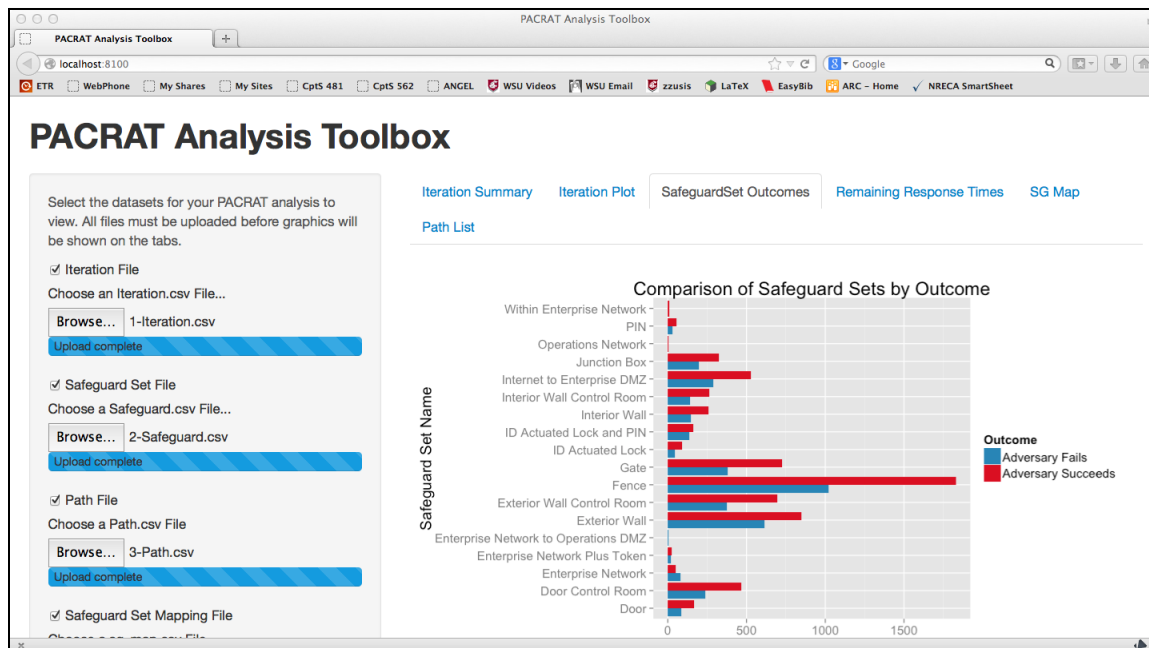
► Interpreting the results ... overall system performance



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► Interpreting the results ... performance metrics



Choose an Iteration.csv File...

Browse... 1-iteration.csv

Upload complete

Safeguard Set File

Choose a Safeguard.csv File...

Browse... 2-Safeguard.csv

Upload complete

Path File

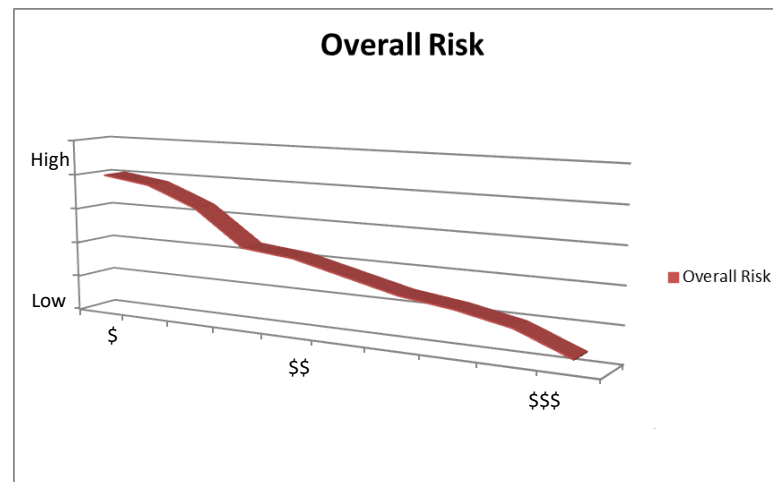
Choose a Path.csv File

Browse... 3-Path.csv

Upload complete

Safeguard Set Mapping File

- ▶ PACRAT also has a Value Added Module to assist in “prioritizing” investment upgrades
 - Automated “what if” analysis
 - Currently a manual, time consuming process
 - Not intended to eliminate the analyst
- ▶ This automated function will “recommend” improvements based on the ROI





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