Cyber Risk to Transportation Control Systems

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Control Systems

- Monitor, operate, and control major industrial systems
  - Power production
  - Power transmission and distribution
  - Water and wastewater control
  - Transportation systems such as the bridge tunnel systems
- Systems are connected through communications networks
  - Physical cable connection
  - Radio signals
  - Via Internet over LAN and WAN.
- Increasingly rely on open forms of communication

Vulnerability

- Experts believe that control systems are more vulnerable today due to
  - Increased standardization of technologies,
  - Increased connectivity of control systems to other computer networks and the Internet
  - Insecure connections
  - Widespread availability of technical information about control systems
  - Little authentication of the origin of the signals

The Need

- Knowledge gap among senior leaders and key stakeholders
  - Most information provided is 'bumper sticker' level
  - Level of abstraction impacts ability to make informed decisions when compared to other more well-known threats (knowledge bias)
- Control systems education is not part of typical computer sciences curriculum
  - IT professionals do not see control systems in the correct context with other IT systems.

A Way Ahead

- Grant received from Virginia Department of Emergency Management
- Short term project (Final report due July 2012)
  - Assess vulnerability of transportation infrastructure
  - Potential consequences of cyber tasks (including use of M&S techniques)
  - Identification of critical concerns
  - Risk mitigation method recommendations

Action

- Develop detailed study plan and implementation plan to conduct the study
- Conduct stakeholder analysis to focus study issues and essential elements of analysis
- Conduct modeling, simulation, and analysis to assess and compare risks
- Suggest methods of mitigation
- Conduct meetings/workshop focused on key stakeholders to identify knowledge and technology gaps

Expert Insight

- Who are the regional experts in transportation control systems?
- Where do these experts see vulnerabilities?
- How are vulnerabilities assessed and compared?
- What is level of preparedness?
  - How can it most effectively be improved?


Questions?