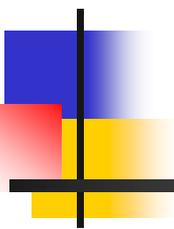


Roadmap to Secure Control Systems in the Chemical Sector



Eric C. Cosman

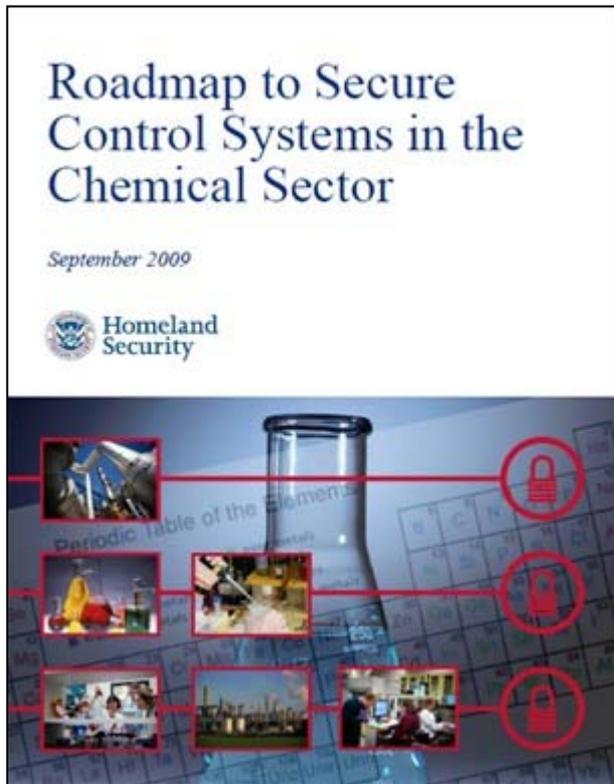
Engineering IT Consultant, The Dow Chemical Company

Chemical Sector Cyber Security Steering Team

ISA99 Committee Co-chair

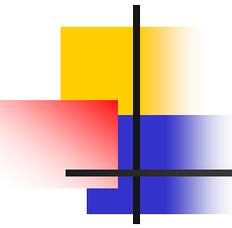
Chemical sector representative to the ICSJWG

Introduction



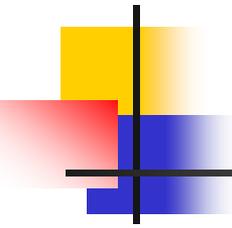
- The “voice” of the sector on improvements to control systems security
- Published September 2009
- Includes a proposed implementation approach
- Identifies milestones over a ten year period

http://www.us-cert.gov/control_systems/pdf/ChemSec_Roadmap_First_Edition.pdf



Topics

- Situation
- Objectives
- Roadmap Approach
- Status
- Roadmap Highlights

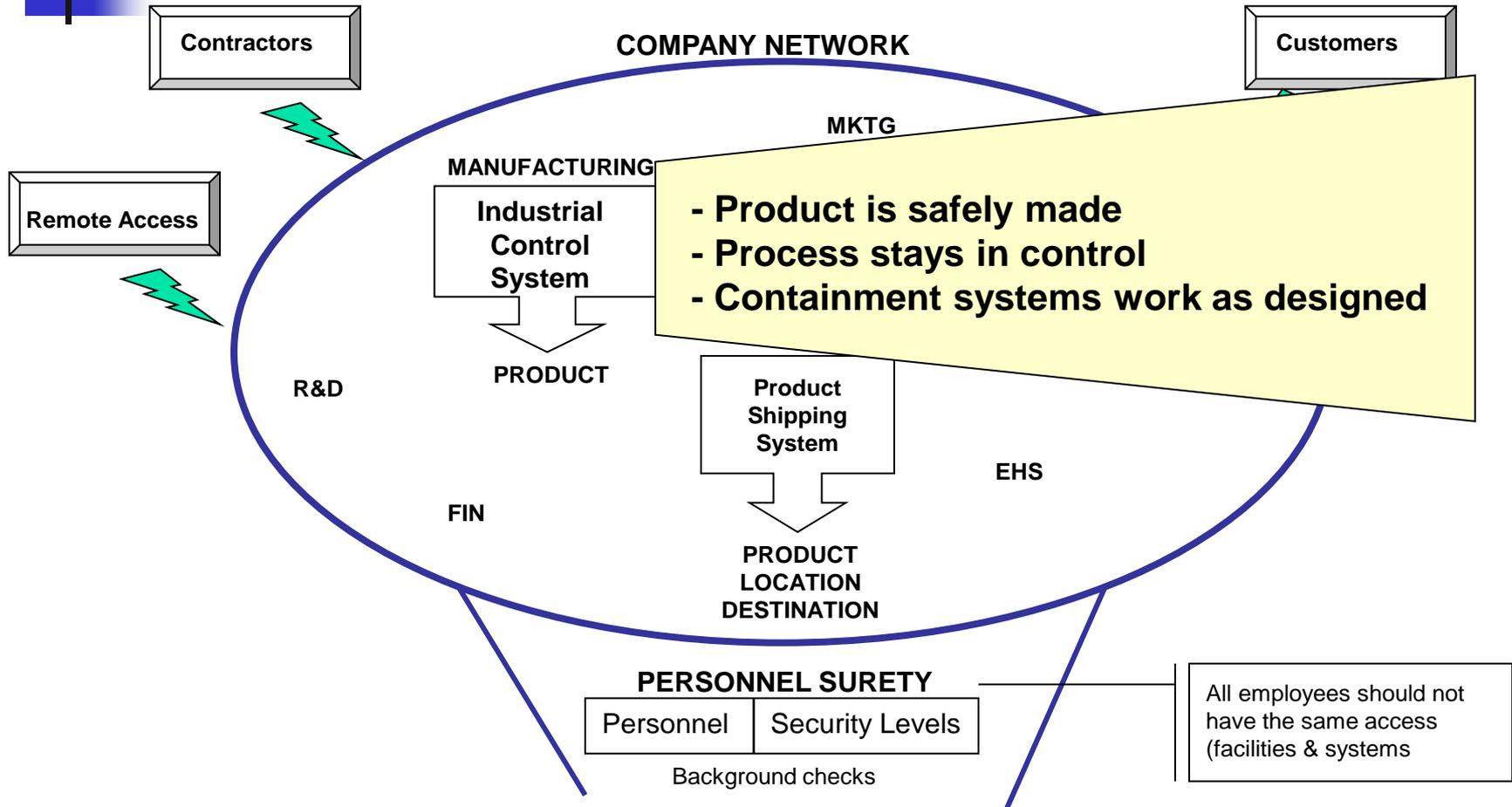


Situation

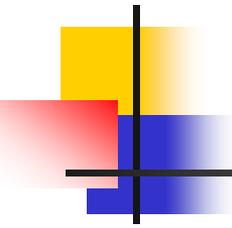
Security Issues

- Increased connectivity
- Interdependencies
- Complexity
- Legacy systems
- System accessibility
- Offshore reliance
- Information availability

CFATS^(*) Compliance

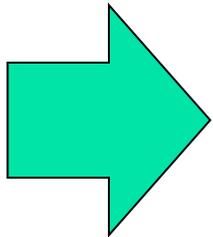


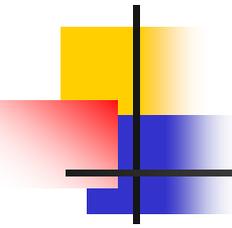
(*) – Chemical Facility Anti-Terrorism Standards



Objectives...

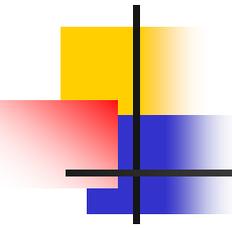
- Present a vision for improved control systems security
- Define a strategy to achieve the vision
- Provide a comprehensive plan
- Encourage participation and compliance
- Clarify how stakeholders can contribute
- Promote continuous improvement





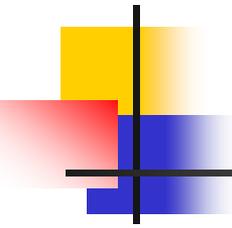
Roadmap Approach...

- Prepare a series of roadmaps, each focused on a particular sector
- Converge on common needs and requirements
- Extract common elements into a cross sector roadmap prepared by ICSJWG
- Individual sectors focus efforts on implementation



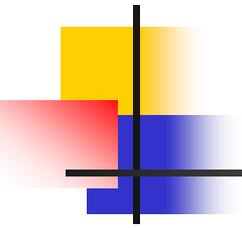
Status

- Roadmap is available from ACC and DHS
- Implementation proposal presented to Sector Coordinating Council
- General agreement and commitment to implementation
- Resourcing details are being addressed
- Participating in ICSJWG effort to create a cross sector roadmap

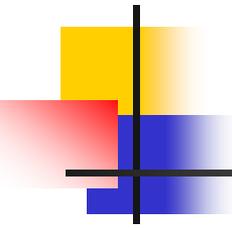


Implementation Roles

- Implementation program manager
- Sector committee member
- Vendors
- DHS (SSA and CSSP)
- Other Federal entities
- State, local and territorial governments
- Owner operators
- Academia

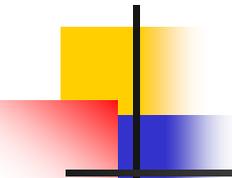


Roadmap Highlights



Scope

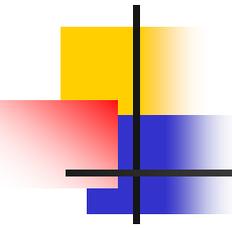
- Focus is on Industrial Control Systems (ICS) in chemical facilities that are part of the critical infrastructure
- Includes possible implications for ICS vendors
- Connection to other systems included if they impact ICS risk
- Planning horizon is 10 years



We intend to...

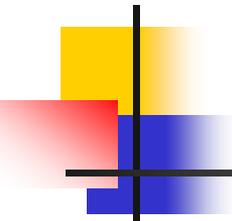
Roadmap Purpose

- Present the Chemical Sector's security vision
- Define a consensus-based strategy for the sector
- Propose a comprehensive plan to improve security
- Encourage stakeholder participation and compliance
- Guide industry, academia, and government effort
- Identify opportunities for cross-sector cooperation
- Promote continuous improvement in security posture



Chemical Roadmap Vision

“In 10 years, the layers of defense for industrial control systems managing critical applications will be designed, installed and maintained, commensurate with risk, to operate with no loss of critical function during and after a cyber event.”

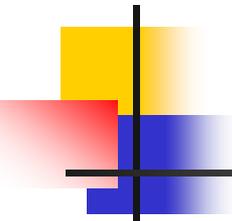


Structure



Vision

- **Goal #1**
 - **Goal #2**
 - **Challenges**
 - **Milestones**
 - **Priorities**
 - **Goal #3**
 - **Goal #4**
-
- Milestones positioned over a ten year period



Goals

Vision of Secure Industrial Control Systems in the Chemical Sector

Vision Statement

In 10 years, the layers of defense for industrial control systems managing critical applications will be designed, installed, and maintained, commensurate with risk, to operate with no loss of critical function during and after a cyber event.

Roadmap Goals

Goal 1

Measure and assess security posture

Goal 2

Develop and integrate protective measures

Goal 3

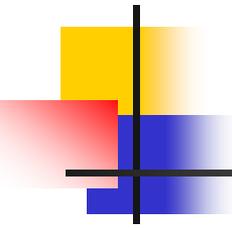
Detect intrusion and implement response strategies

Goal 4

Sustain security improvements

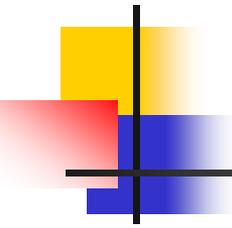
Goal 5

Secure-by-design



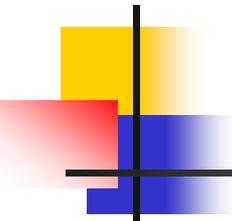
Milestone Examples

- Short Term:
 - Metrics for benchmarking security posture
 - Secure communications between remote access devices and control centers
 - Business case for cost efficient investment in security
 - Owner/operators specific “secure by design”



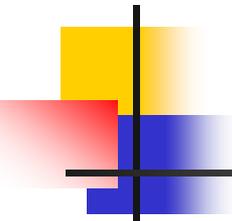
Milestone Examples

- Long Term:
 - ICS architecture with “built in” security
 - Self configuring control systems
 - Certification of control systems as secure



Priorities

- A total of seventy priorities identified across five goals
- Details described in the roadmap document



Questions



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