



Cyber Security for Nuclear Facilities: An Overview of the NRC Regulatory Framework

Craig Erlanger

George Simonds

Cyber Security and Integrated Response Branch
Office of Nuclear Security and Incident Response

U.S. Nuclear Regulatory Commission

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Cyber Security

Today's Overview:

- *Why* – Threat and Consequence
- *What* – Modes of Protection
- *How* – Performance-Based Regulation

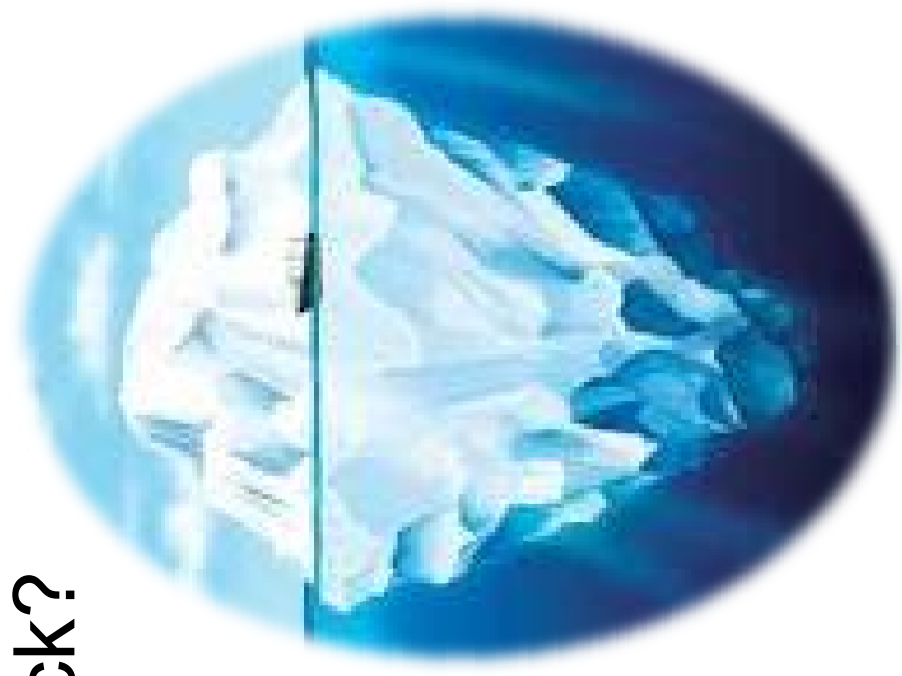
Why – Threat and Consequence

Why - Threat



Why - Threat

- What is an Advanced Attack?
- What We Know/
Don't Know
- Attack Vectors
- Internal/External



Why - Threat

Past

Today



Why – Consequence

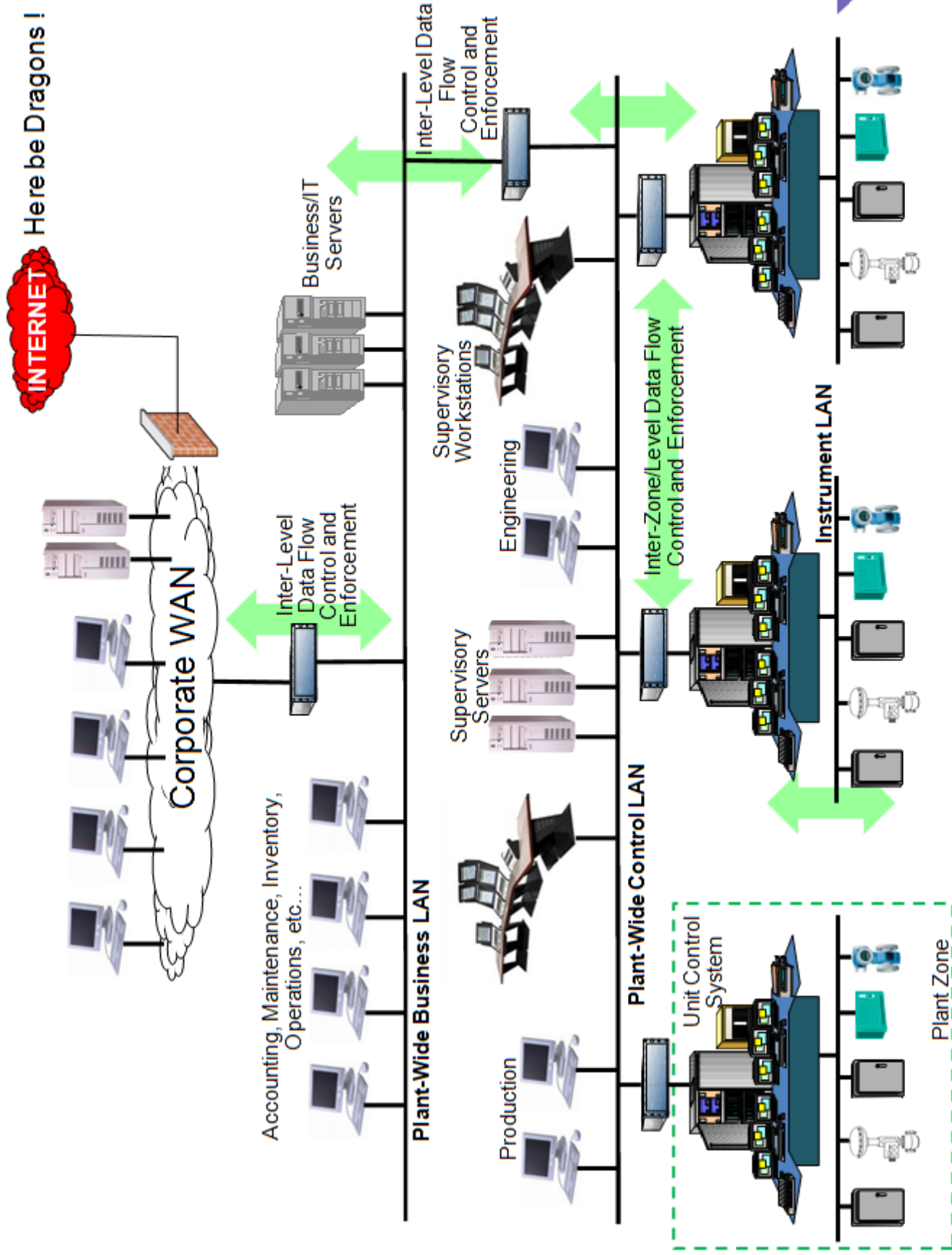
- Not the Same for All Licensees' Facilities
- Perceived and Real Consequences
- Security is a Process
Not a State
- Think Maliciously



What – Modes of Protection

What – Modes of Protection

- Common Taxonomy
 - NIST Special Publication 800-82, “Guide to Industrial Control System (ICS) Security”
- ICS Not Designed with Security in Mind
- Programmatic
 - Standards Tailored for Flexibility & Effectiveness
 - RG 5.71 & NEI 08-09 (R6)



Defense-In-Depth: Multiple levels of Security

How – Performance-Based Regulation



U.S.NRC How – Performance-Based Regulation

United States Nuclear Regulatory Commission

Protecting People and the Environment

- NRC Cyber Security Rule (10 CFR 73.54)
 - Performance-Based, Programmatic
 - FOCUS: High Assurance of **Adequate** Protection
 - Generic (i.e., not reactor-specific)
 - Consistent with regulatory approach for physical security
 - Digital Systems and Equipment Associated with Critical Functions
 - Licensees Perform Analysis to Determine What Needs Protection



U.S.NRC How – Performance-Based Regulation

United States Nuclear Regulatory Commission

Protecting People and the Environment

- Basic Requirements
 - Digital assets that must be protected
 - Defense-in-depth protective strategy
 - Application of security controls to digital assets
 - Implementation details maintained on site
 - Submission of Cyber Security Plans to NRC for approval
- Balance of Plant Systems

How – Performance-Based Regulation

- Regulatory Guidance
 - Align with Programmatic, Performance-Based Rule
 - Integration With Existing NRC Programs (Physical Security, etc.)
 - Template for Licensing
 - Cyber Security Plan

Standards-Based

- NIST
- DHS
- IEEE

Collaboration

- NEI
- Industry
- National Labs
- Private Sector

Finalize

- Concurrence
- ACRS Approval
- Publicly Available

How – Performance-Based Regulation

- Challenges
 - Scope of Cyber Security
 - Breadth of Programs (Physical Security, Maintenance, Digital I&C Development, etc.)
 - **Monitoring the Threat-scape**
 - Workforce Training and Development



U.S.NRC *How – Performance-Based
Regulation*

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Protecting People and the Environment

- Path Forward for RTRs
 - Self-Assessments
 - NRC Evaluation of Self-Assessments
 - Site Visits
 - Determine Next Steps
- Additional Considerations for Cyber Security
 - Cyber Security Roadmap
 - Guidance Development
 - Cyber Security Training
 - Interagency and International Support

Questions?