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Maritime Transportation System Information Sharing and Analysis Center

How to Navigate Operational Technology (OT) Cybersecurity in Port Environments

AAPA WEBINAR

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Introduction

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- 20+ years Intel, Info Sharing, Cybersecurity
- USCG Cyber Command, Navy Cyber Defense Operations Command, Private Sector Maritime Stakeholders

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- 15+ years of experience in IT and OT security
- Worked at KVH Industries

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Agenda

- The Maritime Cyber Threat Landscape
- Potential Impacts of a Cyber Attack
- Information Technology vs. Operational Technology
- Emerging Cybersecurity Compliance Standards for Ports
- OT Cybersecurity Best Practices
- Recommendations & Key Takeaways

The Maritime Cyber Threat Landscape

Actors

- State level
- Criminal
- Insiders
- Activists

Motivations

- Political / Strategic
- Financial / Smuggling
- Revenge / Unintentional
- Ideologocial

Objectives

- Data, Information
- Funding source
- Smuggling
- Disrupt / Destroy
- Media / Attention

Potential Impacts of a Cyber Attack Against Maritime OT

- Organizational
  - Can place significant strain on multiple teams involved in operations, IT, customer service, etc. - this is an organizational challenge
  - Financial and/or reputational impacts
- Supply Chain
  - Impacts to both upstream and downstream maritime stakeholders
  - Intermodal disruptions as well as impacts to other critical infrastructure
- Safety & Security
  - Environmental / hazardous material incidents
  - Availability and integrity of cranes, pumps, etc.
  - Access controls – gates, CCTV, etc.

IT vs. OT Security: What's the Difference?

- The goal of information technology (IT) security is **to protect the confidentiality of data** flowing between connected devices. IT devices include:
  - **Employee workstations**
  - **Tablets**
  - **Telecommunications equipment**
  - **Servers in a data center**
- The goal of operational technology (OT) security is **to ensure the availability and integrity of systems that control physical processes**. OT devices includes things like:
  - **Power systems**
  - **Programmable logic controllers**
  - **Cranes**
  - **Building devices**
- Because OT systems are different from traditional IT computing systems, you need to approach cybersecurity differently, too.
  - **More sensitive to intrusive security methods, like scanning**
  - **Insecure by design- most devices have built-in remote access for vendors and third parties to perform maintenance**
  - **Operate in real-time and can have physical consequences**

Emerging Cybersecurity Compliance Standards

NVIC 01-20

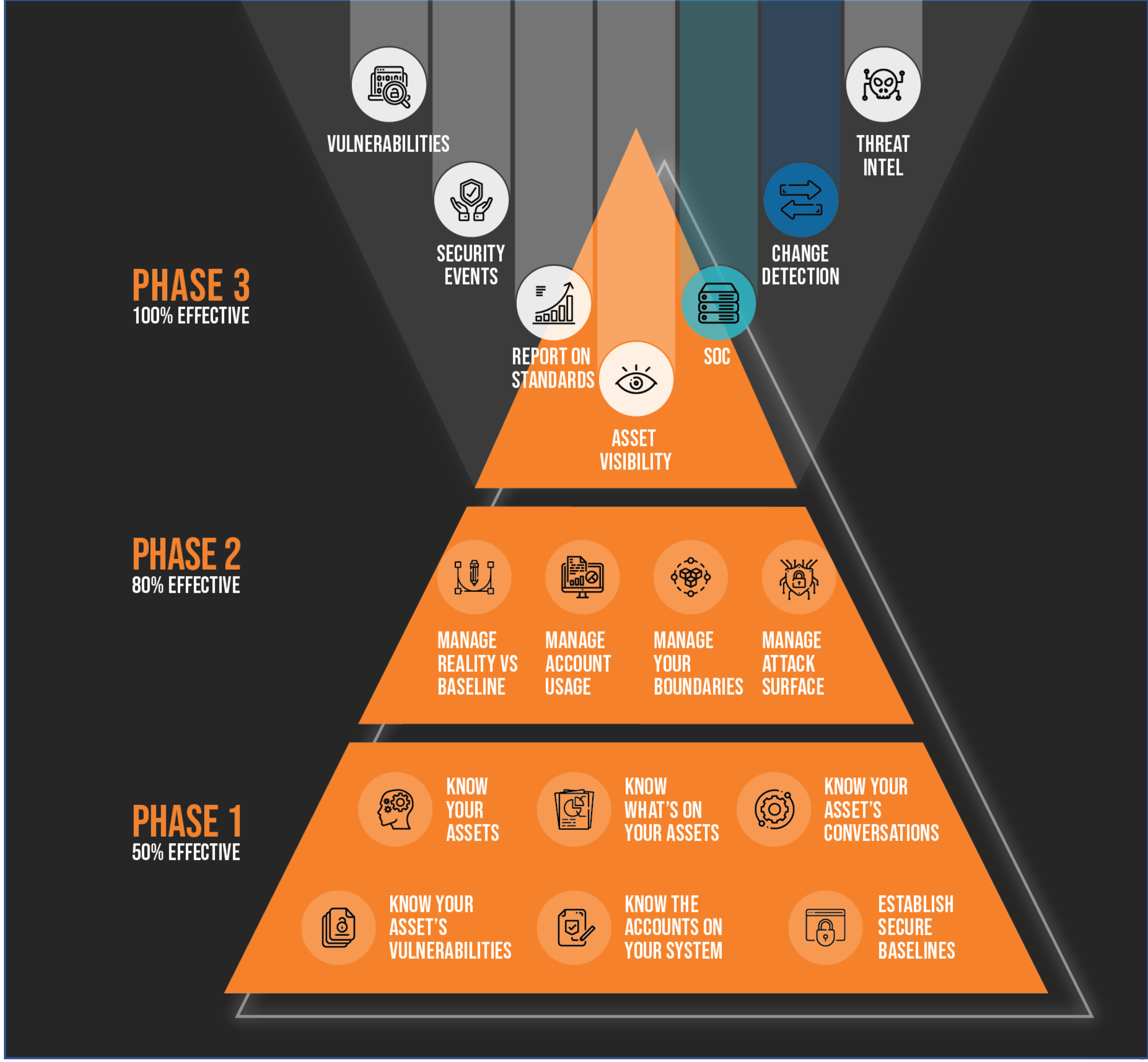
ISPS

ENISA

- Colonial Pipeline incident impacts-new regs will likely affect ports

OT Cybersecurity Best Practices

- It all starts with knowing **everything** about your devices, including:
  - Where they are
  - What's on them
  - What they talk to
  - Who can access them
  - What their vulnerabilities are
  - What a healthy baseline looks like



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How Do I Collect OT Asset Information?

ACTIVE

Agents

Pros:

- The most comprehensive data collection – identify anything
- Easy to manage centrally
- No credentials required

Cons:

- Requires installation and resources on the endpoint

Agentless/Native Querying

Pros:

- Second most comprehensive data collection method
- Leverages the same collection methods created by the device vendor
- Can be done from a centralized data collector

Cons:

- Requires routable connections to device and credentials

How Do I Collect OT Asset Information?

PASSIVE

Offline Collection

Pros:

- Serial/air-gapped assets with no other way to get
- If config file processed, still more accurate than spreadsheets

Cons:

- Only as good as last copy of config from device
- Manual work, but can be part normal routine if planned correctly

Network Monitoring

Pros:

- Quick to deploy if the infrastructure supports it
- Quickly find unknown IP based assets
- Threat Intel

Cons:

- Limited ability to collect data
- May require multiple sensors and SPAN/TAP/Mirror Ports in the target networks
- Not comprehensive enough for a compliance program or vulnerability management

What Else Is Important?

- Vulnerability identification and management
- Threat detection capabilities
- Visibility and monitoring of 3rd party maintenance actions
- Built-in compliance reporting for your standard
- Integration with existing cybersecurity infrastructure (SIEM, etc.)

Recommendations & Key Takeaways

Organizations should seek to manage risk across people, process and technology

- Appoint a named cybersecurity leader
- Align security strategy with business roadmap to promote safe, secure and resilient operations

Cyber hygiene controls are first step to reducing risk

- After that, detection of anomalous activity, threat hunting, and information sharing reduce ability for adversaries to "live" in networks and decrease risk of catastrophic cyberattacks

Third party / vendor risk management needs to improve

- Software inventory should include Software Bill of Materials (SBOM)
- Monitor third-party maintenance activity
- Information sharing can improve detection and response

Questions?