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RSAConference2022

San Francisco & Digital | June 6 – 9

TRANSFORM

SESSION ID: **SAT-W02**

The Cyber Physical War – Lessons From the Digital Front Line

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Industrial Cybersecurity is Hitting a Tipping Point

Ransomware Attacks in 2021[1,2]

105%

increase Worldwide

104%

increase in North America

80%

of organizations were hit by a ransomware attack and more than

60%

of those organizations paid the ransom

Top Ransoms Paid in 2021

May 2021	June 2021
Colonial Pipeline Co. $4.4 Million	JBS $11 Million
Brenntag $4.4 Million	

Recent Attacks to Critical Infrastructure

- Oldsmar Water Treatment Facility – Feb. 2021
- German Fuel Supply Terminal – Feb. 2022
- Ukraine Attacks – Feb. and Apr. 2022
- German Wind Turbines – Feb. and Mar. 2022

High-Profile Vulnerabilities Discovered in the Last Six Months

- Log4J – Dec. 2021
- APT Cyber Tools Targeting ICS/SCADA Devices – Apr. 2022
- Pipedream Malware Toolkit Discovery – Apr. 2022

A New Priority for Governments and Trade Associations

IACS International Association of Classification Societies: UR E26 and UR E27

NIST National Institute of Standards and Technology, U.S. Department of Commerce: NIST SP 800-82r3

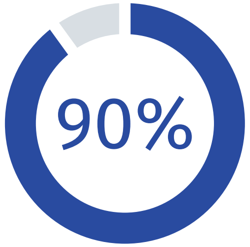
CSA Singapore: Cybersecurity Act, Part 5

Pipeline Security Guidelines Update

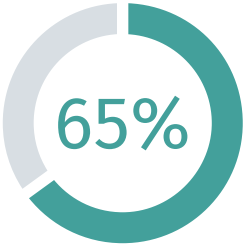
الهيئة الوطنية للأمن السيبراني
National Cybersecurity Authority: Operational Technology Cybersecurity Controls (OTCC-1:2022)

Executive Orders

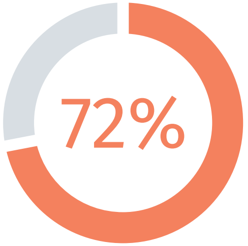
OT Cybersecurity by the Numbers



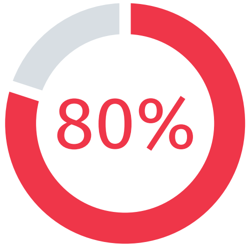
Organizations that use **OT systems** have experienced some sort **of cyber incident** in the **past year**. [3]



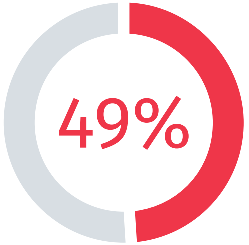
Organizations with **limited visibility** in their control systems [4]



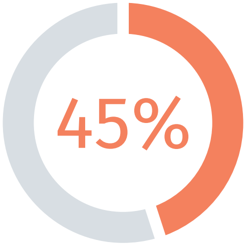
Organizations that **don't have full visibility** into their **supply chains** [5]



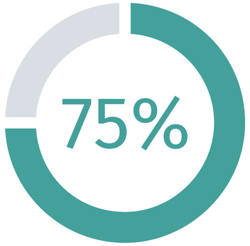
Organizations that find it **difficult to stop cyber** attacks **in time** [6]



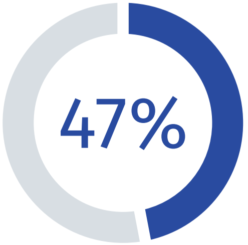
Increase in **ICS vulnerabilities** between 2019 and 2020 [7]



Organizations with **control systems at high risk** [8]



External attacker can **penetrate** the **ICS networks** at 75% success rate [9]



Organizations **without internal resources** to manage **OT/ICS incidents** [10]

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Perspectives From the Digital Front Line

I Spoke to the Digital Front Line

Suppliers
& Vendors
Government
Technical
Implementors
(OT &IT)
Board
Members
Insurers

My background

- 25+ years in strategy and cyber
- 6+ years focused on industrial cyber for critical infrastructure
- 100s of conversations and engagements across all audiences
- 40+ countries

I spoke with

- Technical Experts (Analysts, Threat Hunters, Labs)
- Government (Regulators, State Governments, Standards Orgs)
- Insurance Companies (Insurers, P&I Clubs, Associations)
- Supply Chain & Manufacturing (Suppliers, OEMs, Manufacturers)
- Implementors (CISOs, Plant Managers, Service Providers)
- Board of Directors (Boards, Analysts, Executives

Technical Experts

Who we asked

- Threat Hunters
- Managed Service Analysts
- White-Hat Hackers
- Cyber Labs

What you need to know

- OT is less mature and much more exposed
- Digitization expanding the attack surface
- Risk to safety – site, public, environment
- No such thing as "air gapped"
- Almost no visibility into OT systems
- OT takes specific expertise

What you need to do

- Do the basics – Asset inventory, identity management, monitoring, response
- Know the identities that access OT systems (e.g., suppliers) and how they access them

> "I've been able to hack into an industrial site in less than eight minutes… my coffee wasn't even cold."
>
> ~ White Hat Hacker

> "Attacks like Colonial Pipeline might be a warning bell for us, but it's a dinner bell for attackers."
>
> ~ Cyber Specialist

Government Perspective

Who we asked

- Federal Agencies (CISA, USCG, TSA, DHS)
- Sate Governments
- International Governments
- Standards and Governance Organizations (e.g., IMO, NIST, NERC)

What you need to know

- Increase attacks on critical infrastructure has broad impacts on the economy, national security and political stability
- Definition of critical infrastructure expanding
- Regulations will focus more on monitoring
- Compliance does not equal security
- Supply chain risk management is key

What you need to do

- Go beyond compliance and put in what will make you secure
- Make sure you have strong monitoring, reporting and response controls in place
- Look closely at supply chain risk management

> "It is the policy of my administration that the prevention, detection, assessment and remediation of cyber incidents is a top priority and essential to national and economic security."
>
> ~ Executive Order on Improving the Nation's Cybersecurity – May 2021

Insurers Perspective

Who we asked

- Insurance Companies
- P&I Companies
- Insurance Associations
- Insurance Focused Law Firms

What you need to know

- Cyber physical events straining insurance and driving costs up
- Cyber is very hard to underwrite
- Premiums are going up significantly
- Underwriting becoming much more stringent
- Exclusions are important

What you need to do

- Read the fine print and watch exceptions
- See how policies interrelate (e.g., suppliers, pollution)
- Come prepared to underwriting sessions
- Make insurance part incident response plans

> "It will be harder to qualify for cyber insurance, and the implementation of many common cybersecurity controls will increasingly be required as a condition of coverage."
>
> ~ Joshua Motta,
> CEO and co-founder of Coalition

Suppliers Chain and Manufacturing

Who we asked

- Supply Chain and Manufacturing Executives
- OEMs
- Technology Providers

What you need to know

- Attacks can happen on the supply chain
- Attacks can happen through the supply chain
- You inherit the risk of you full supply chain
- Supply chain resiliency can work against cyber resiliency
- Most supply chains lack visibility & control

What you need to do

- Employ security by design
- Cyber map your supply chain
- Consider cyber acceptance testing

> "The pressure on building supply chain resiliency, but we don't think about cyber security when we do that…that could be disastrous."
>
> ~ Manufacturing Executive

Implementors Perspective

Who we asked

- CIOs
- Operation Mangers (e.g., plant, site)
- Industrial Cybersecurity Provider (technology and services)

What you need to know

- The digital front lines are in their networks
- Responsible for industrial cyber risk reduction
- There is often tension between IT and OT
- IT solutions will not work in an OT environment
- Technology alone cannot be the solution

What you need to do

- Create a position to lead industrial cyber
- Make sure to have domain expertise
- Build a balanced program that covers Assess and Plan, Protect and Defend, Detect and Respond

> “You can’t take an IT solution and put it into an OT environment. You might bring the network down.”
>
> ~ Operations Manager

Board of Directors Perspective

Who we asked

- Board Members
- Executives Who Present to Boards
- Market Analysts

What you need to know

- OT is the core of the business identity and revenue generation
- Risks are growing exponentially
- IT is often confused with OT
- Compliance does not equal security
- Cyber is important, but there is confusion

What you need to do

- Be clear on the Board's priorities and position
- Present cyber in a business context
- Be clear on risks and priorities
- Educate the board and dispel myths

> "Boards know cyber is a big problem. Beyond that, there's a lot of confusion."
>
> ~ Board Member
> Oil & Gas Industry

> "Most of us on the Board don't understand cyber but we do understand business and risk. Speak our language when you present to us."
>
> ~ Board Member
> Maritime Company

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The Future of OT Cyber

Prediction #1: OT cyber will overtake IT as the priority for companies

1 OT cybersecurity has a direct impact to revenue, operations, safety, brand and legal exposure

2 Increase in attacks on critical infrastructure is shifting the focus to OT

3 Companies don't want two programs and recognize OT as the more specialized field

4 Companies are asking OT cyber managed services to also provide their IT cybersecurity

So what…

- IT focused companies need to offer OT services
- CISO roles need to evolve to fully address OT
- OT will be the priority at board discussions and key to getting funding

> "They talk about OT-IT convergence. It's not a convergence, it's a hostile takeover."
>
> ~ CISO

> "The OT cyber company is covering our crown jewels in operations. We don't want two companies covering cyber, so we are asking them to cover both."
>
> ~ Senior Executive, Power & Energy

Prediction #2: Companies will buy services, not technologies

THE GLOBAL INDUSTRIAL CYBERSECURITY MARKET SIZE IS EXPECTED TO REACH

$22.8 BILLION BY 2026

according to KBV Research

- First wave of solutions - OT Technology
- Customers ill-equipped to apply technology
- Too many solutions, confuse customers
- Need is shifting to manages services
- OT takes domain expertise

So what…

- OT technology companies and OT managed services will need to form strong partnerships
- Customer solutions will include both services and solutions
- Technology sales without services will constrict to larger customers

> "Technology is not enough, without someone who knows what to do with it. It's just an expensive paperweight."
>
> ~ Executive, Power & Energy

> "We don't have the manpower, expertise or resources to handle this. We need a partner."
>
> ~ Executive, Maritime

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Prediction #3: Market drivers will be more important than regulations

Insurance

Proposal Assessments

M&A Due Diligence

Market Valuation

So what…

- Position industrial cyber as competitive advantage
- Make OT cyber part of RFP assessments
- Conduct maturity assessments to make sure you rate highly

> “Compliance motivates you to do the least, competition motivates you to do the most.”
>
> ~ Executive, Oil & Gas

> “What if there was some sort of Moody’s rating or credit score for OT risk? That would impact valuations and drive change.”
>
> ~ OT Analyst

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Conclusions

Applying OT Cyber

Do Now

- Conduct a Maturity Assessment and Build a Roadmap that fits your risk environment, strategic goals and budget realities
- Develop and incident response plan
- Resolve any potential IT-OT conflicts
- Understand where your regulatory environment is heading
- Get senior management and/or the Board involved in your industrial cybersecurity

Do Next

- Hire a head of OT cybersecurity
- Put the basics in place for your OT Systems
  - Asset Inventory and Management
  - Vulnerability Management
  - Monitoring and Response
  - Training
- Report to the Board or senior management regularly
- Consider cyber insurance to augment your program

Sources

- [1] Fortune.com – There's a huge surge in hackers holding data for ransom, and the experts want everyone toa take these steps
- [2] Forbes - A Majority Of Surveyed Companies Were Hit By Ransomware Attacks In 2021—And Paid Ransom Demands
- [3] 2021 The State of Operational Technology and Cybersecurity – Fortinet
- [4, 8,10] 2022 SANS Survey – Threat-Informed Operational Technology Defense: Securing Data vs. Enabling Physics
- [5] Industry Week—Can't Turn Back Time: Cybersecurity Must Be Dealt With—2017
- [6] Gartner—Market Guide for Managed Security Services—2020
- [7] Forbes X Force Threat Intelligence index—2021
- [9] Help Net Security— The cybersecurity of industrial companies remains low, potential damage can be severe—2021