National Defense Industrial Association

Promoting National Security Since 1919

Quantifying Defense Supply Chain Economic Impact:
Strategies For Creating Value Amid Volatility

Panel Discussion
Protecting the Digital Thread

Global Supply Chain Summit
June 26, 2014

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ANSER
An Operating Unit of Analytic Services Inc.

Protecting the Digital Thread
Panelists

Michael McGrath, *Vice President, Systems and Operations Analysis, Analytic Services Inc.*

Dan DiMase, *Director, Compliance and Quality, Honeywell International Inc.*

John Toomer, *Director, Intelligence, Information & Cyber Systems, Government Operations, The Boeing Company*

Manufacturing is a Cyber-physical Business

Common Visions

Smart Manufacturing,

Industrial Internet,

Industry 4.0, …

The Internet of Things!

Advanced Manufacturing is:

- Driven by a "Digital Thread" of product and process information – ***valuable intellectual property (IP)***
- Networked at every level to gain efficiency, speed and quality
- Targeted by global cyber threats

The Threat is Global and Growing

Manufacturing is an inviting target

The Washington Post

Washington, DC May 28, 2013 Edition: U.S. | Regional Make us your

Weapons designs compromised by Chinese hackers

Ellen Nakashima 10:54 PM ET

Cyber Security

German jitters over cyber attacks

www.DW.DE , 8 Mar 2013

W32.Stuxnet Dossier

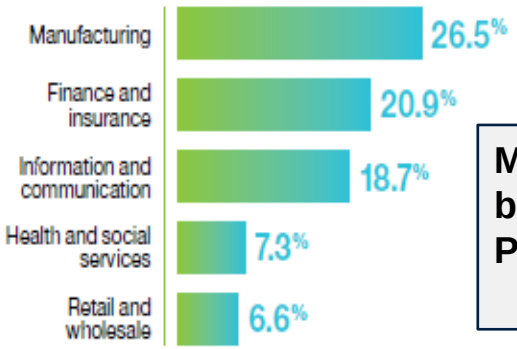
Version 1.4 (February 2011)

Symantec Security Response

MANDIANT

APT1

Incident rates across monitored industries



IBM Security Services Cyber Security Intelligence Index 2014

Manufacturing: a 1 in 3 chance of being targeted by at least one Spear Phishing attack in 2013

Symantec Internet Security Report 2014

intel Security

Cost to Global Economy > $400 B

KASPERSKY

WHO'S SPYING ON YOU?

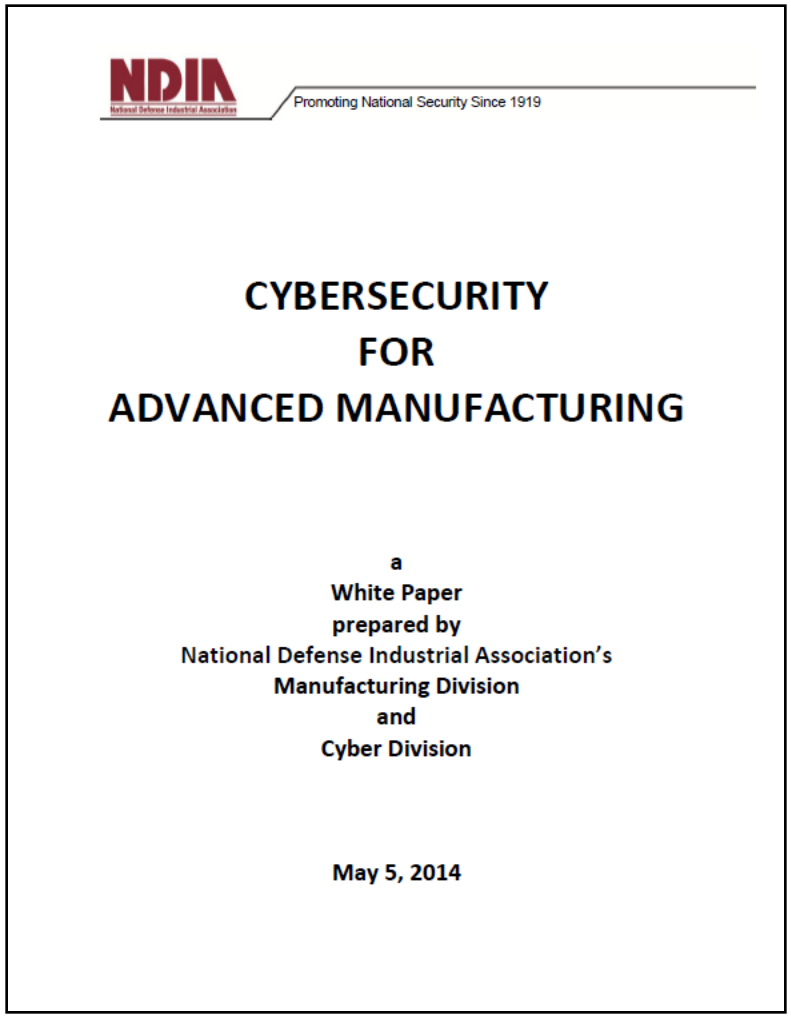
No business is safe from cyber-espionage

verizon

2014 DATA BREACH INVESTIGATIONS REPORT

NDIA White Paper

Protecting the Digital Thread



NDIA
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CYBERSECURITY
FOR
ADVANCED MANUFACTURING

a
White Paper
prepared by
National Defense Industrial Association's
Manufacturing Division
and
Cyber Division

May 5, 2014

Manufacturing Concerns:

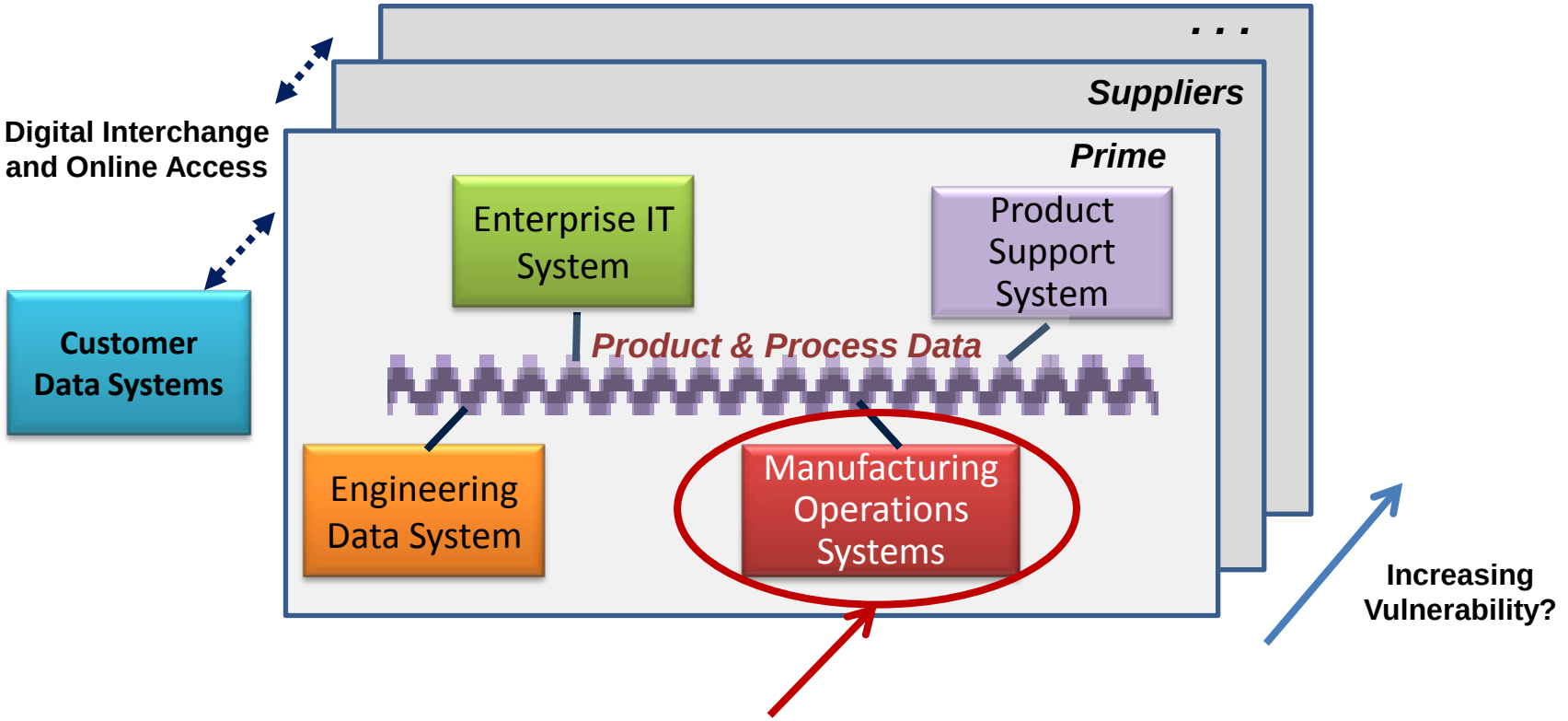
- **Theft of technical info** -- can compromise national defense and economic security
- **Alteration of technical data** -- can alter the part or the process, with physical consequences to mission and safety
- **Disruption or denial of process control** -- can shut down production

A risk management problem. Need resilience!

Scope: Protecting the Digital Thread

Technical Data in the Advanced Manufacturing Enterprise

Targeted by nation states, terrorists, criminals and hacktivists.



IT Cyber Security Solutions
May Not Fit Manufacturing Operations Needs

What We Heard from Interviews

Gov't, Industry, Academia

- CIOs/CISOs in the defense primes are implementing strong cyber risk management and sharing info through the DIB CS/IA and DSIE programs
  - *Concerned about suppliers and willing to work with them*
  - *Have not yet seen threat to factory systems, but acknowledge the possibility*
  - *Need cost/risk tradeoffs to arrive at an affordable solution*
- Industrial Control Systems (ICS) are soft targets. Culture differs from IT.
  - *Standards and guides* for ICS provide good risk management approaches. Implementation is spotty.*
- DoD has mandated protection of critical information
  - *Primes address in the program protection plan, but ICS security is not emphasized in DoD guidance*
- Defense R&D for cybersecurity is not currently focused on factory floor

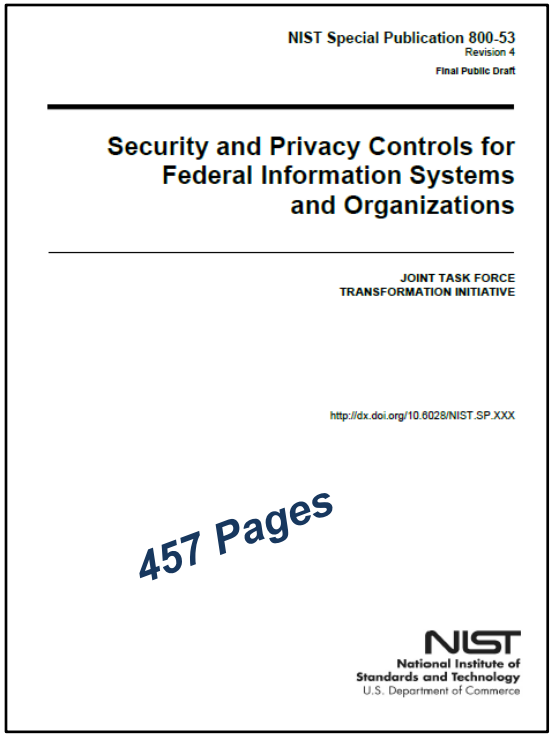
*E.g. ANSI/ISA99 standards and NIST SP 800-82

Operational Technology (OT) vs. IT
What's Different?

- **ICS systems are long-lived capital investments (15-30 year life)**
  - *Old processors, operating systems, protocols, and configuration control.*
  - *New systems architected for security, but hard to integrate with old*
- **"Production mindset" with little tolerance for OT down time**
  - *Operate in real time with critical safety implications – cannot install patches without scheduled downtime and testing*
  - *System availability valued over integrity or confidentiality. Weak privilege management among operators and maintainers who troubleshoot the systems. Growing use of wireless devices.*
  - *Nascent cybersecurity awareness. Poor password management, etc.*
- **Manufacturing differs from other ICS applications (Power Grid et al.)**
  - *Every manufacturing job brings new executable code into system*
  - *Tech data flowing through the system is a target*

Recent Developments

- **Federal Register 18 Nov 2013 -- *DFAR 252.204–7012 Safeguarding of unclassified controlled technical information.***
  - Specifies 54 minimum security controls linked to NIST SP 800-53
  - Reporting of cyber incidents to DoD within 72 hours
  - Reviews and data retention to support DoD Damage Assessments
  - Mandatory flow-down to subcontracts



- **NIST *Cybersecurity Framework for Critical Infrastructure Protection (Feb 2014)***
  - Common vocabulary, core standards and practices
  - Risk-based. Voluntary adoption.
  - Sector-specific implementation, including training and incentives.

NDIA White Paper Recommendations for USD(AT&L)

1. Designate a focal point to work with industry on risk-based, voluntary standards and practices for factory floor cybersecurity.
   - Evaluate NIST framework as starting point.
2. Conduct forums with industry to help understand and implement DFARS clause, including factory floor implications.
3. Update DoD guidance on the Program Protection Plan (PPP). Let industry make appropriate risk/cost tradeoffs.
4. Use red teams to expose vulnerabilities and R&D to fill gaps
5. Assist SME suppliers with training and investments
   - NIST Manufacturing Extension Partnership to deliver training
   - Defense Prod Act Title III and Manufacturing Technology investments
   - Training for DoD contracting officers

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