THE ENERGY INFRASTRUCTURE INITIATIVE

"GREATER THAN THE SUM OF ITS PARTS"

International Conference on Quality, Leadership and Management in the Nuclear Industry

Ottawa, Canada

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

DAN PASQUALE
SR. REACTOR SYSTEMS ENGINEER
(301) 415-2498
Daniel.Pasquale@nrc.gov

NRC MISSION

To license and regulate the nation's civilian use of byproduct, source and special nuclear materials to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment.

OFFICE OF INVESTIGATIONS

Responsibilities outlined in

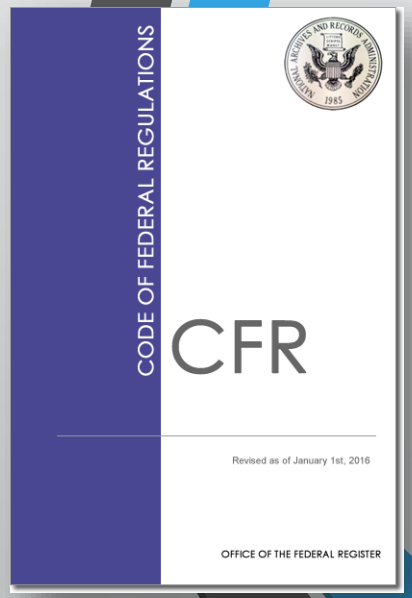
Title 10 of the CFR, Part 1.36, “Office of Investigations”

- Conducts investigations of allegations of wrongdoing
- Maintains current awareness of inquiries and inspections by other NRC offices
- Makes appropriate referrals to the Department of Justice
- Liaise with other agencies and organizations, both domestic and international, to ensure the timely exchange of information of mutual interest

Counterfeit, Fraudulent, Suspect Items (CFSI)

The Office of Investigations:

- is committed to combatting the introduction of counterfeit parts into the nuclear supply chain through strategic partnerships with internal and external stakeholders
- is collaboratively working with other government agencies and industry to proactively identify CFSI before it enters into the US critical infrastructure (i.e., nuclear supply chain)
- works closely with our inspectors and the technical staff whenever there is a report of CFSI



10 CFR 50, APPENDIX A
General Design Criteria

For those Systems, Structures, And Components (SSC) deemed "Important to Safety," the GENERAL DESIGN CRITERA provides design, fabrication, construction, testing, and performance requirements that provide ***reasonable assurance*** *the facility can be operated without undue risk to the health and safety of the public*

"REASONABLE" ASSURANCE:

1. *to the **best possible extent** provided given the situation's circumstances, the author is reasonably sure that his conclusions are free from material misstatement*

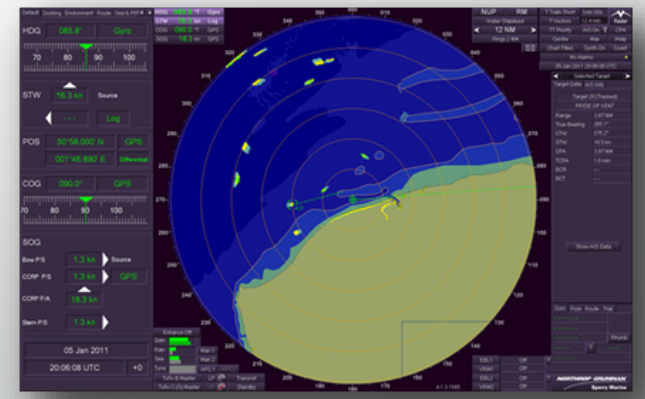
2. *acknowledgment that it is **not possible** to assert absolutely and certainly that an event will (or will not) occur*

REASONABLE ASSURANCE

is constantly evolving!

*"**Reasonable**" evolves consistent with the "Body Of Knowledge". What was understood to be reasonable in 1818 may not be reasonable in 2018!*

➔



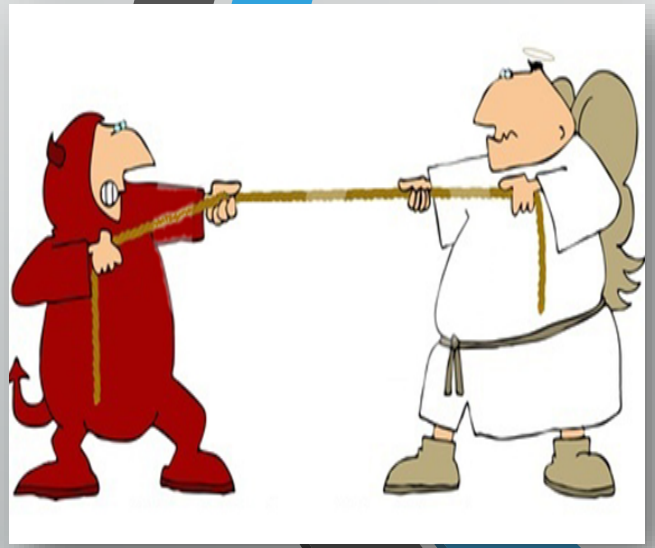
CFSI: THE EPITOME OF "UNCERTAINTY"

- **Will it fail?**
- **When will it fail?**
- **How will it fail?**
- **How will it's failure effect other components?**
- **Trend data?**

- **No Warranties or Guarantees**
- **No Vendor support**
- **No Nuclear liability**

  - Single Failure Criterion (SFC)
  - Common Cause Failure (CCF)
  - Probabilistic Risk Assessment (PRA)
  - Core Damage Frequency (CDF)

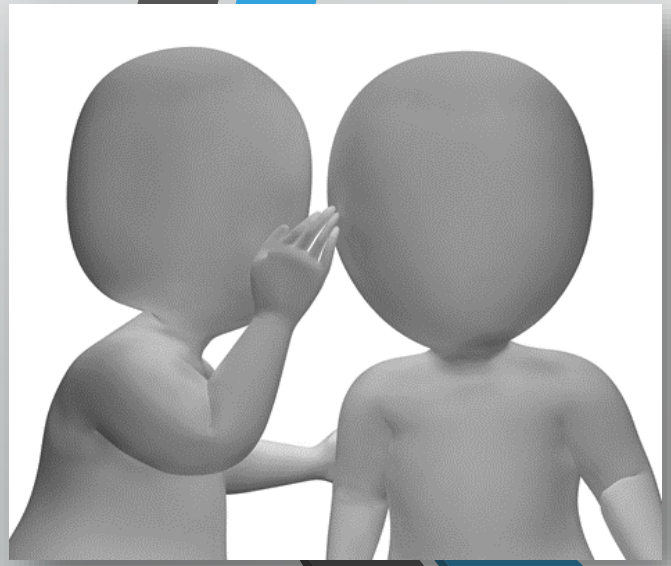
POOR PERFORMANCE vs. WRONGDOING



*Poor performance by a vendor resulting in a nonconformance, while **undesirable**, can be managed by effective customer oversight.*

*Intentionally misrepresenting equipment, parts or materials **is illegal** and must be dealt with appropriately*

NRC ALLEGATIONS PROGRAM



Allegation (in-part): *"A declaration, statement, or assertion of impropriety or inadequacy associated with NRC-regulated activity, the validity of which has not been established"*

The NRC's Allegation Program is:

designed to review **anyone's** concerns regarding safety significant issues associated with NRC regulated activities

Contact any NRC employee (including a resident inspector), or e-mail the NRC at ALLEGATION@nrc.gov, or call the NRC's toll-free Safety Hotline, 1-800-695-7403

NUREG BR-0240 "Reporting Safety Concerns to the NRC"
https://www.nrc.gov/docs/ML1214/ML12146A003.pdf

COMMERCIAL GRADE DEDICATION

"An **acceptance process** undertaken to provide **reasonable assurance** that a commercial grade item to be used as a **basic component** will **perform its intended safety function** and, in this respect, is deemed **equivalent** to an item designed and manufactured under a 10 CFR Part 50, appendix B, quality assurance program."

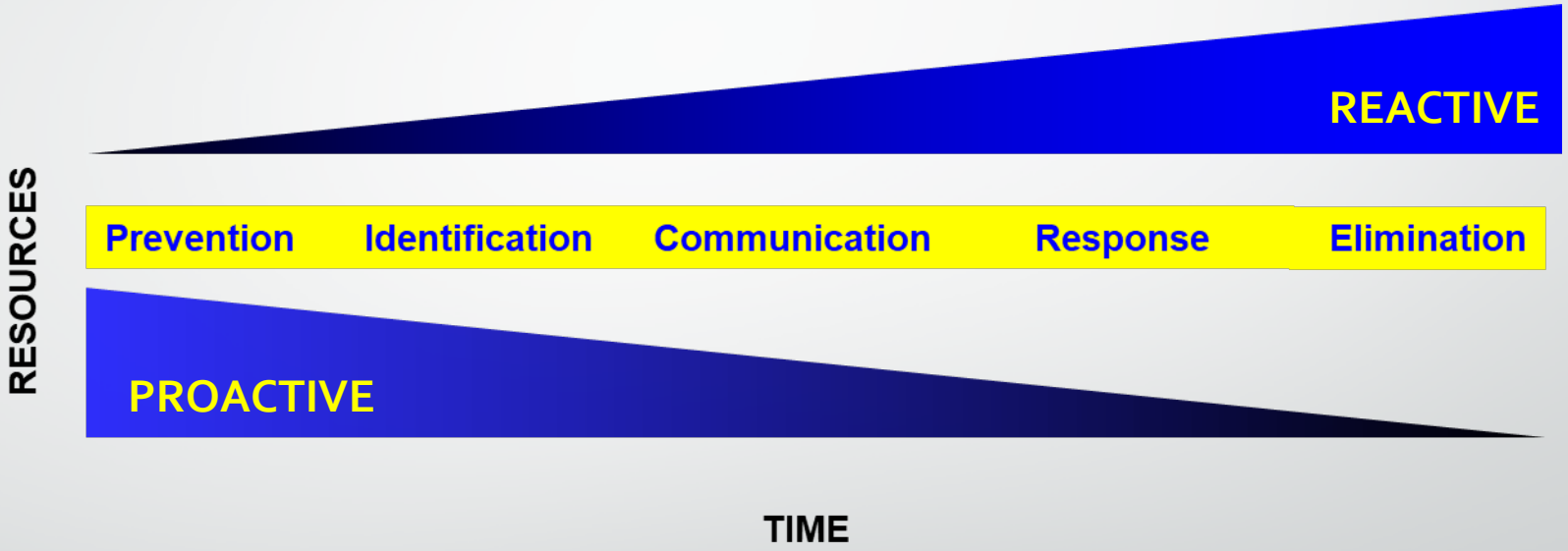
– *10 CFR 21*

U.S. Department of Commerce, 2010
Defense Industrial Base: Counterfeit Electronics

KNOW YOUR SUPPLY CHAIN!

- Historic increase in counterfeit electronic incidents
- 140% increase in DoD counterfeit electronic reports: 2006-2009
- 82% of companies DO NOT report CFSI
- Increased use of commercial-grade dedications
- Supply chain globalization
- Industry-wide transition to digital technology –Advanced microcircuit technology (including programmable logic controllers)
- Cyber Security for Critical Infrastructure (embedded/tainted code)
- Advanced Counterfeiting Technologies

GLOBAL SHIFT IN CFSI RESPONSE PROTOCALS



Reactive → Proactive

DEPARTMENT OF HOMELAND SECURITY, CUSTOMS AND BORDER PROTECTION, HOMELAND SECURITY INVESTIGATIONS

NATIONAL INTELLECTUAL PROPERTY RIGHTS CENTER

"Greater Than The Sum of its Parts"

- 23 partner agencies, consisting of 19 key federal agencies, Interpol, Europol and the governments of Canada and Mexico in a task-force setting.

IPR CENTER AGENCIES

Piracy is not a victimless crime

NATIONAL IPR CENTER
A Law Enforcement Initiative

Effectively leverage the resources, skills, and authorities of each partner and provide a comprehensive response to IP theft.

Investigation – Identifying, analyzing, deconflicting, prosecuting and dismantling criminal organizations involved in the manufacture and distribution of counterfeit products.

Interdiction – Using collective intelligence & detective resources to perform raids, surges, focused targeting and inspections to keep counterfeit and pirated goods out of U.S. industrial supply chains.

Outreach and Training – Providing training for domestic and international law enforcement to build stronger enforcement capabilities worldwide.

OPERATION CHAIN REACTION (OCR)

A comprehensive initiative targeting counterfeit items entering the supply chains* of the Department of Defense and other U.S. government agencies.

** "supply chains" includes those of public and private critical infrastructure entities regulated by OCR agencies (e.g., NRC)*

THE ENERGY INFRASTRUCTURE INITIATIVE

OCR/EII COLLABORATION

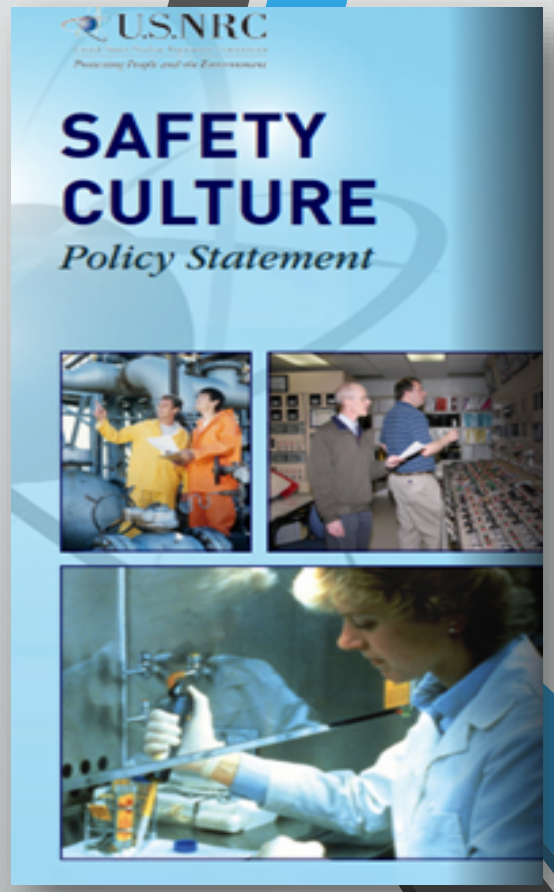
- Proactive Information re: CFSI
- Harder for the dishonest to re-invent themselves
- Access to more Operating/Construction experience
- Expedited CFSI Alerts/Advisories (contain the spill)
- Avenue for reporting **non-power block** CFSI

COLLABORATIVE EFFORTS

Greater than the sum of its parts!

The only effective way to combat the problem is PROACTIVELY.

- Regulator
- Licensee
- Supply Chain
- Trade Associations
- Law Enforcement
- Federal Agencies
- Academia



NUREG/BR-0500 - ML15062A478

NUCLEAR SAFETY CULTURE

The NRC's Safety Culture policy statement, "applies to all licensees, certificate holders, permit holders, authorization holders, holders of quality assurance program approvals, vendors and suppliers of safety-related components, and applicants for a license, certificate, permit, authorization, or quality assurance program approval subject to NRC authority."

- NUREG/BR-0500, Rev. 3

ADVANCING DUE DILIGENCE

- Assist with high risk procurements (incl. CDAs)
- Data Analytics (DataNet)
- Supplier Vetting
  - Access to U.S. Government data
  - Credible & trustworthiness
  - Transnational records
- Financial "stresses"
  - Bankruptcy/delinquency litigations
- Supplier relationship intelligence
  - Time in business
  - "Cage Hoppers/Jackers"
  - System for Award Management (SAM, f.k.a. Excluded Parties List-EPLS)
  - Subsidiary relationships
  - Foreign ownership/global parents

Non-POWER BLOCK CFSI

- OSHA safety gear (hard hats, goggles, gloves)
- Emergency response equipment (Fire/medical)
- Security forces (ammunition/body armor/sights)
- Hand & power tools
- Rigging equipment, hose fittings
- Refrigerants

EMERGING THEMES

Favorable criminal environment:

- lack of reporting
- little fear of prosecution
- low fines and sentences upon conviction
- unprecedented anonymity
- may involve alternate illicit activities

Favorable profit margins:

- high profit potential
- low capital and labor costs
- access to sub-suppliers
- easily distributed via the internet
- no research & development costs
- no advertising costs
- minimal legal expenses

Favorable market conditions:

- obsolescence *(aging operating units)*
- advancing technology *(digital I&C)*
- global supply chain *(58 nuclear plants under construction worldwide)*
- diminishing 10 CFR 50, Appendix B suppliers *(more CGDs)*
- new norms *(high in-service failures)*

THE EVOLUTION OF THE CFSI CRAFT

From back alley to back door!

Modernized, sophisticated sub-industry used to fund other crimes including:

Cyber Hackers

Money laundering

Terrorist activities

Transnational organizations

Organized crime syndicates

Political activists

Culture jammers

Nation-states

WE ARE WHAT WE CONSUME!

- SELECT ONLY THE BEST INGREDIENTS -

then & now

As publicly reported:

REPUTABLE ORGANIZATIONS

- **10/16/17 -** *"Kobe Steel Scandal Goes Nuclear: Company Faked Data For Decades, Had A "Fraud Manual"" _www.zerohedge.com*
- **10/15/17 -** *"Kobe Steel Scandal Could Rattle US Nuclear Industry" _wolfstreet.com*
- **03/24/17 -** *"Inspectors find safety irregularities at Creusot nuclear forge in France" _www.theguardian.com*
- **05/04/16 -** *"France's nuclear giant Areva admits to 400 irregularities' in power plant parts"_ www.telegraph.co.uk*
- **02/17/16 -** IN-16-01: "Recent Issues Related to the Commercial Grade *Dedication of Allen Bradley 700-RTC Relays" _NRC*
- **08/03/15 -** "Relay manufacturer quietly changes internal parts, *creates potential safety hazard"*_www.nuclearelectricalengineer.com

PRESIDENTIAL POLICY DIRECTIVE (PPD-21)

"Critical Infrastructure Security and Resilience"

(2013)

… advances the Community of Interest Concept

- Regulator (USNRC)
- Commercial Nuclear Licensees
- Key IP Rights Owners
- National IPR Center (DHS/ICE/HIS)
- Trade associations
- Academia

PPD-21: https://obamawhitehouse.archives.gov/the-press-office/2013/02/12/presidential-policy-directive-critical-infrastructure-security-and-resil

IN SUMMARY

"In all aspects of IPR crime enforcement, there is an identified and ongoing need for enhanced cooperation and education amongst all stakeholders and intermediaries to ensure that the fight against such criminality and its effects becomes more cohesive and well informed"

- EUROPOL's 2017 Situation Report on Counterfeiting and Piracy in the European Union

- **The NRC's Office of Investigations supports those recommendations for a more COLLABRATIVE and PROACTIVE approach to CFSI**

QUESTIONS ???

DAN PASQUALE

U.S. NRC, Office of Investigations

(301) 415-2498

Daniel.Pasquale@nrc.gov