

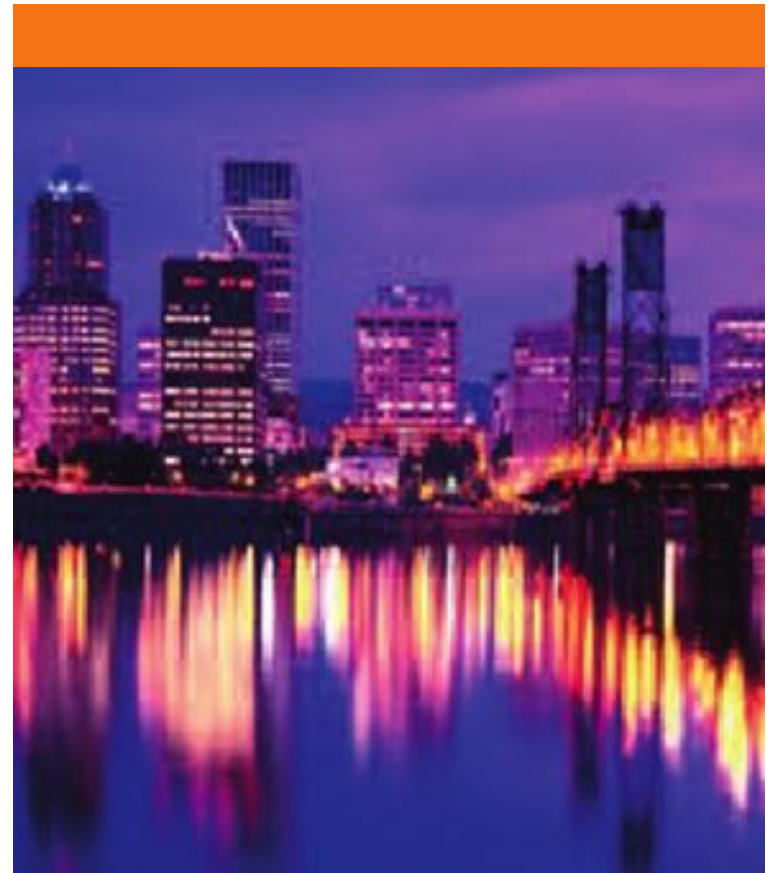
Welcome to
**"Curse of Counterfeit -
Demonstration and
Prevention!"**

"Reliability thru Quality"

NUPIC Meeting June 2017

Presenters: Roger Moerman, Tom Grace, M.
Tannenbaum and

Shamsher (Sham) Beri – Portland General
Electric – Trojan Nuclear Plant



© 2012 Portland General Electric. All rights reserved.

Introduction of the Presenters

- **Roger Moerman – AtkinsGlobal Energy Americas**
- **Tom Grace - Brand Protection Manager Eaton**
- **Marc Tannenbaum – EPRI**
- **Shamsher (Sham) Beri – Portland General Electric – Trojan Nuclear Plant since 1992**

Daily Hazards of CFSI



Let's Define CFSI

- **Counterfeit:**

- Imitation or alteration of a legal product without legal right
- Imitation with the purpose of passing false copy for authentic / genuine without authority

- **Fraudulent:**

- Intentional misrepresentation to deceive
- Incorrect identification
- Falsified or inadequate certification
- Used / defective items sold as new

Fraudulent Documentation – Recent Challenges

- March 11, 2013: Arkansas Nuclear One Sr. Emergency Planner **Falsified documents** regarding Drills/Surveillances per the station's Emergency Plan.
- Oct. 2013: Two convicted murderers in Florida - **using forged documents**, for which they had paid about \$8,000 each, were released from prison!
- In 2016: Areva, faced a major scandal after the country's nuclear watchdog confirmed there have been "irregularities" in 400 parts produced for its reactors since 1965. Authorities are assessing whether at **Creusot Forge documents** may have been "**falsified.**"
- Jan 27, 2017: CB&I Laurens, SC Sr. QC Specialist was suspended pending Employee Review Board action for **Falsification of UT tests.**
- March 28, 2017 NRC Operations Center Event Report indicated that a **Forged VT-1, 2, 3 Level II** training record was being circulated.

Fraudulent Documents in Korea.....

- **November 5, 2012:** two reactors at the Yonggwang Nuclear Plant in South Korea shutdown.
- **Between 2003 and 2012,** eight (8) suppliers supplied:
 - 7,682 items (for example, fuses / power switches) worth almost \$0.75 million
 - **Forged quality certificates**
- **Spring 2013:** Questionable components installed in 14 of the 23 South Korean nuclear plants resulting in **three reactors shutdown.**
- A company that was supposed to test reactor parts skipped portions of examinations / tests, doctored test data - **even issued safety certificates for parts that failed its tests.**
- Some officials at the design firm have taken bribes to accept the substandard parts. **Root cause: Cronyism.**
- Prosecutors raided the offices more suppliers suspected of also providing parts with **faked quality certificates.**

Let's Define CFSI (cont'd...)

- **Suspect:**

- Items suspected of being counterfeit or fraudulent
- Legally, may not be appropriate to call an item counterfeit / fraudulent unless verified
- Conclusive investigation might be very costly.
- Prudent course of action: Consider obtaining an authentic item or one that complies with the specification
- CFSI are generally “assumed” to be imported – but often are “Made in the USA”
- **“Intent” vs. “Error”**

Regulatory Basis for CFSI?

Here is what App. B & NQA -1 Say

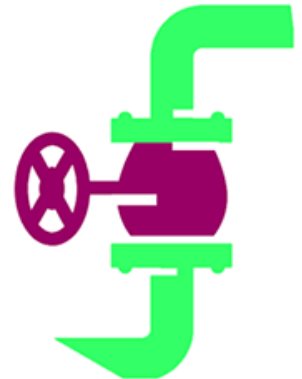
- **Criterion 4....** *applicable regulatory requirements, design bases, and other requirements which are necessary to assure adequate quality are included in the documents for procurement ...*
- **Criterion 7...** *Measures shall be established to assure that purchased materials conform to the procurement documents. These measures shall include source evaluation and selection, objective evidence of quality furnished by the contractor, inspection at the contractor source, and examination of products upon delivery....*

ISO 9001:2015 states, in part...

- **8.4 Control of Externally Provided Processes, Products and Services (EPPP&S) (continued)**
 - **8.4.2 Type and Extent of Control:** *The organization shall ensure that EPPP&S do not adversely affect the org's ability to **consistently deliver conforming products** and services to its customers.*
 - *The organization shall **define both the controls it intends to apply to an external provider and those it intends to apply to the resulting output.***
 - *The organization shall **determine the verification, or other activities, necessary to ensure that the EPPP&S meet requirements.***

CFSI: A Historical Perspective

- Various incidents - 1980s:
 - Electrical equipment - e.g., Nuclear Regulatory Commission (NRC) Information Notice (IN) 88-46 reported problems with defective surplus / refurbished circuit breakers.
 - Pipe materials, fittings, flanges
 - Valves / replacement parts
 - Fasteners
- But in smaller quantities....
- Very poor quality – most didn't work
- Sense of arrogance by U.S. industry – were not seen as a threat
- Interesting: United States (US) Secret Service first established in 1865 - main duty: prevent **counterfeiting** of money, NOT protection!



CFSI are Everywhere!

- Counterfeit / fraudulent items - common – fake consumer products frequently in the news:
 - Fine Watches! (see: Luxury Replicas, Rolexes, etc., at e.g., <http://www.perfectwatches.cn/>)
 - Pet Food!
 - Designer Handbags!
 - Children's Toys!
 - Wine! – seen this >>>>>>>?! (see next slide)
 - Pharmaceuticals! (several have resulted in deaths)
 - NFL merchandise (almost \$39 million before '16 Super Bowl)
- Any others?
- Articles of interest - Dangerous Fakes: How counterfeit, defective computer components from China are getting into U.S. warplanes and ships, Business Week, October 2, 2008



Incident in Brazil

- Eletronuclear's Angra Nuclear Power Plant Unit 2 - July 2007
 - Steam generator water level was dropping.
 - Plant supposed to control the level automatically, but it wasn't.
 - Water level reached minimum allowable.
 - Reactor scrammed.
 - Contacts of breaker that commands the valve were stuck (bonded).
 - Root cause analysis: contacts were not original. Silver plating was not correctly applied.

Incident in Brazil (cont' d)



CFSI contacts after 5 months

Original contacts after 1 cycle

Incident in Brazil (cont' d)



Original – note CE logo and holographic sticker

CFSI contacts

Top 10 Counterfeit Industrial / Construction Goods

1. Steel
 2. Fasteners
 3. Valves
 4. Pipe
 5. Circuit Breakers
 6. Rotating Equipment
 7. Electric Equipment
 8. Pipe Fittings
 9. Pressure Vessels
 10. Cement
- Counterfeiters traditionally have flooded retailers with knock-off shoes, DVDs and luxury goods.
 - Construction commodities are now an easy target since:
 - They cost little to make and
 - They fly under the radar of law enforcement.
 - Fake critical components (e.g., steel, electrical parts and plumbing) are readily available over the Internet.

Reasons Why CFSI Keep Proliferating

- Poor Global Economic Prognosis – Quick Buck!
- Buyers ask for quick supply at low price
- Lack of dialogue among all parties: Customers, Suppliers, Law Enforcement
- Assumption: “others” in the supply chain are testing the product
- Internet sales – bypass traditional channels direct to customers
- Many don't know who to contact in Federal / State Government or applicable Industry Group.
- Most Companies / Organizations: no policies in place to prevent CFSI from infiltrating their supply chain.

Lets See Some Real CFSI Items

Roger Moerman **AtkinsGlobal Energy Americas** **Other physical examples:**

- **Flex Connector**
- **Blind Flange**
- **Stainless Steel Flanges (2)**
- **Quick Disconnects**
- **Bridle Slings**

Flex Connector (Expansion Joint)



Flanges are supposed to be 150 # Stainless Steel

150 # Blind Flange



Markings on
outer edge of
flange:

B16.5

150 #

304/304L

SA182 (Forged
Item)

FUS

On surface 4
numbers
(cold rolled plate
markings)

Identical Flanges



Flanges have the same part number on the outer edge of the flange.

Note the ID on both.

Compare the raised face.

Quick Disconnects



Stainless Steel -
300 series.

No
manufacturer
markings

Note – Blank
windows

Bridle Slings

Purchased With Credit Card



Purchased as “brand new”



Over stamped – WLL
2200 now stamped
3100

Recent Example Coming From Approved Supplier



Q Level 1 Items

Received from
Q Level 1
approved Supplier

Cost >\$1,000 each

Question?

What Action(s)
should occur
at this point?

Why Should We Care?

Tom Grace
Brand Protection Manager
Eaton

Why Should We Care?

- Potential serious operational safety concerns –
Public, Employees and Nuclear Customers
 - Used in safety-related (SR) system? Could cause failure of SR equipment to perform as intended.
 - Could create hazardous situation at critical load path, e.g.,:
 - Structural component (bolt, in a crane, hoist or other handling / lifting equipment that bears the load) being lifted / moved
 - Electrical safeguard (circuit breaker)
- NRC IN 2008-04: potential for CFSI to enter supply chains (no major instances 1998 – 2006)

Why Should We Care?

Circuit breakers are designed to provide safe electrical power distribution by protecting installed wire and connected devices against unsafe conditions such as overloads and short circuits



Example: Why Should We Care?



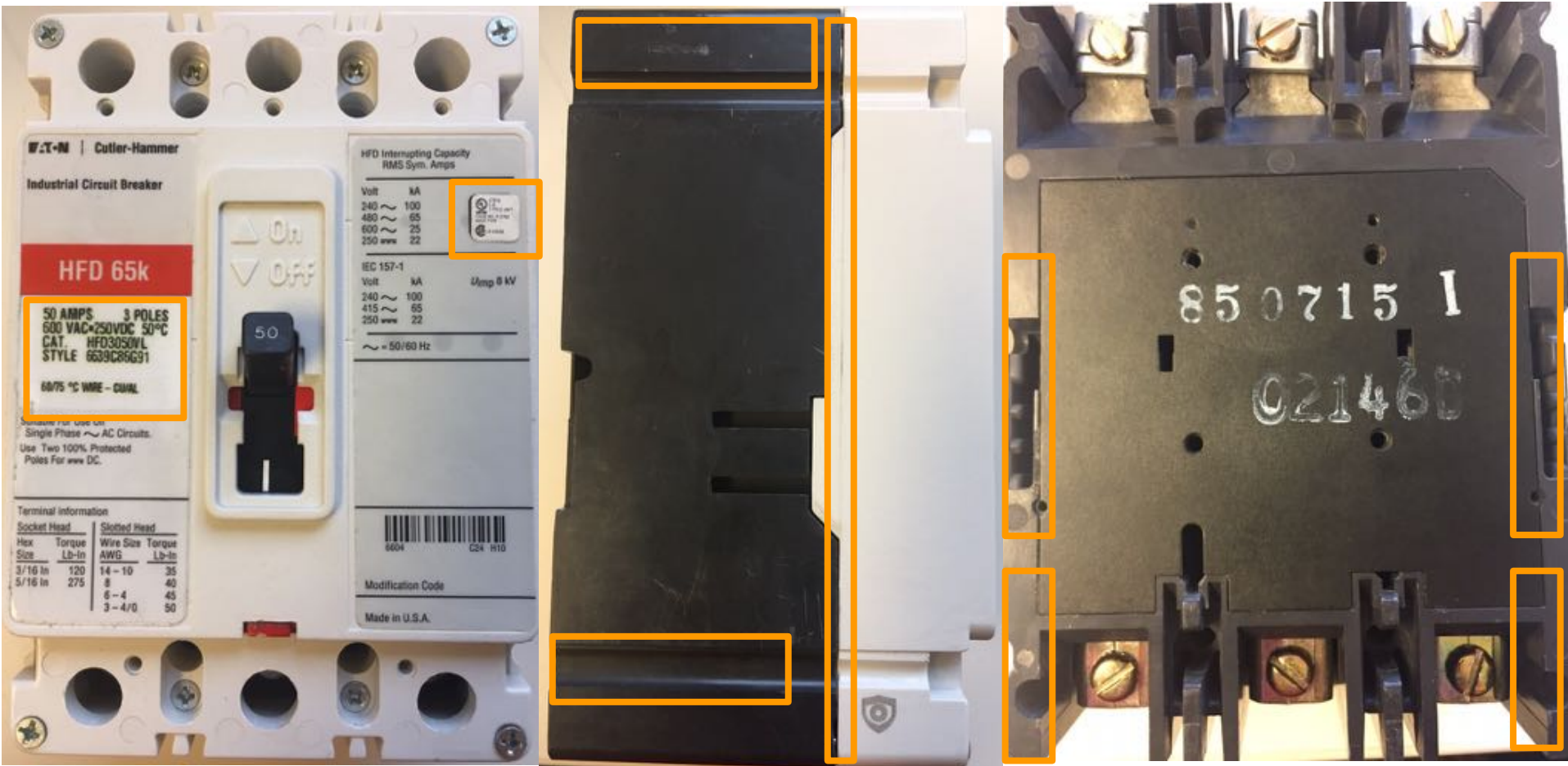
New Product received for CG Dedication

Example: Why Should We Care?



Would you see Red Flags?!

Example: Why Should We Care?



Counterfeit in detail!

Example: Why Should We Care?

CGD Data Sheet

Page 1 of 1

General Data: COUNTERFEIT BREAKERS														
Material Identification:		Breaker, Circuit												
Part Number:		HED0002V5		Manufacturer:		EATON								
Purchase Order:		[REDACTED]		Receipt No:		[REDACTED]								
Cat ID, No:		[REDACTED]		Site:		[REDACTED]								
Functional Test Data														
Item #	Mechanical Operation	Insulation Resistance	Power Operation Tests									Initial	Date	
			Intermittent Over Current Trip for adjustable Trip unit						Thermal Trip Test					
			Actual Trip Amperage Range: 400 - 1000 A			Actual Trip Time at 100 Amps Range: 0.1 - 100 sec			Actual Trip Time at 100 Amps Range: 0.1 - 100 sec					
			Pole A	Pole B	Pole C	Pole A	Pole B	Pole C	Pole A	Pole B	Pole C	Rated Current		
140206-T	SAT	SAT	1032a/4cy	865a/3cy	1051a/4cy				22s	21s	17s	SAT	[Signature]	2-27-17
880719-J	SAT	SAT	1033a/4cy	1004a/3cy	1126a/3cy				36s	37s	29s	SAT	[Signature]	2-27-17
918730-J2	SAT	SAT	1042a/3cy	873a/5cy	1143a/1cy				70s	67s	58s	SAT	[Signature]	2-27-17
160119-T	SAT	SAT	1060a/3cy	905a/2cy	864a/2cy				20s	20s	18s	SAT	[Signature]	2-28-17
061121-B	SAT	SAT	1012a/3cy	992a/2cy	1047a/2cy				57s	74s	76s	SAT	[Signature]	2-28-17

Technician:	Sign:	[Signature]	Date:	2-28-17
	Print Name:	[REDACTED]		

Form No: CGD-011 TEE, Rev. 0, Date 3/23/08

CGD testing does NOT reveal Counterfeit Danger !

Why Should We Care?

CSFI Recap:

- Multiple orders from (2) vendors.
- Molded case circuit breakers:
 - (5) HFD3050VL
 - (3) HFD3030V
- Not purchased from a manufacturer's representative, documentation not provided
- Product found to be counterfeit, scavenged, altered, modified and unsafe.

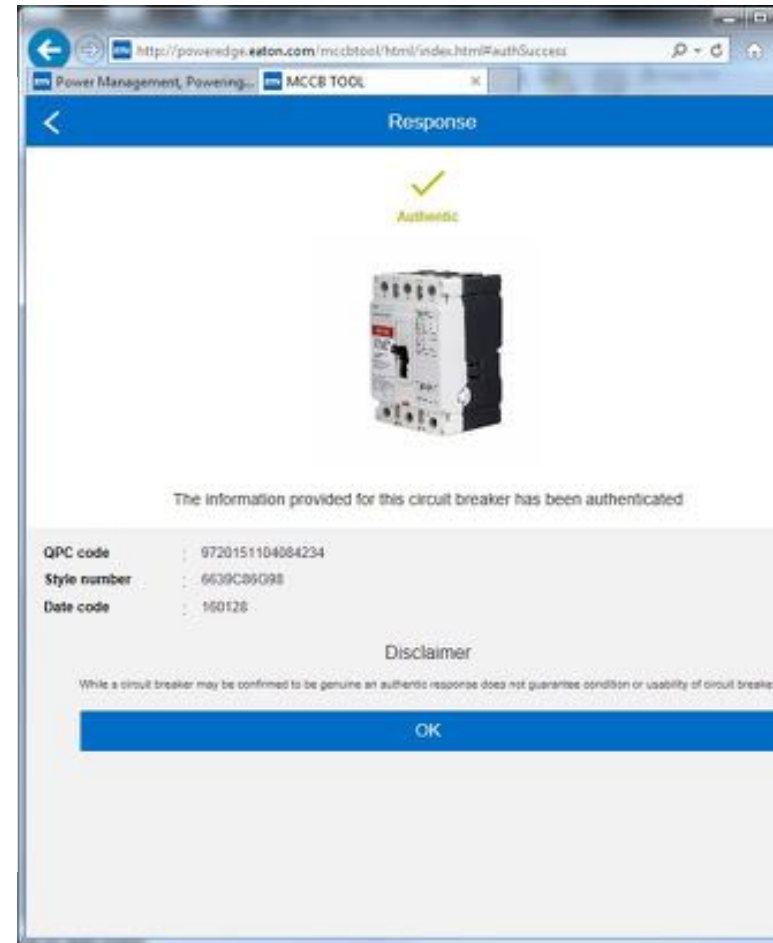
Why Should We Care & What to Do

- Know Counterfeit Products Pose a Danger
- Know Counterfeits are Hard to Spot
- Know You Can Mitigate the Risk
- Know How to Report a Counterfeit

Authentication: Why Should We Care

Eaton's MCCB tool with Authentication

- Support of Eaton's MCCB products through 400A (launched 2011)
- Circuit Breaker authentication and product information
- Responsive design for desktop and mobile devices
- Eaton's PowerEdge App for iOS and Android devices



Authentication: Why Should We Care

Square D MCCB's – New Hologram in 2015

- The new hologram incorporates state-of-the-art technologies that help to identify genuine Square D MCCB's.



The center background of the label appears dark in color.

The bottom right corner has a number that will change when the label is rotated.



Rotating the label 90 degrees makes the dark turn light and the number in the bottom right corner change.

For more information or to report counterfeits, go to www.reportcounterfeitproduct.com

Why Should We Care & What to Do

- You can easily become an unsuspecting victim of counterfeit products
- You should always be able to track a product to the original OEM – authorized distribution
- Authenticate whenever possible using the manufacturer's published information
- Alert the OEM of any suspect products that you might encounter

EPRI Guidance on Prevention, Detection, and Control of Suspected Counterfeit and Fraudulent items

Marc Tannenbaum
Technical Executive

NUPIC Vendor Conference
June 22, 2017



EPRI 3002002276, Counterfeit and Fraudulent Items, Mitigating the Increasing Risk, Revision 1 of 1019163, 05/2014

- NRC SECY-15-0003 (ML14240A692) states:
 - “... the EPRI guidance document provides the necessary fundamental elements for detecting and preventing CFSI from affecting NRC-regulated activities”*
- Historical Perspective
- Recent Incidents
- How CFIs are introduced
- Prevention, Detection, and Control
- Reporting and Sharing
- Benchmarking results
- Standard contract clauses



The big picture

- According to U.S. Immigrations and Custom Enforcement / U.S. Customs and Border Patrol [1]



[1] Intellectual Property Rights Seizure Statistics, U.S. Customs and Border Patrol

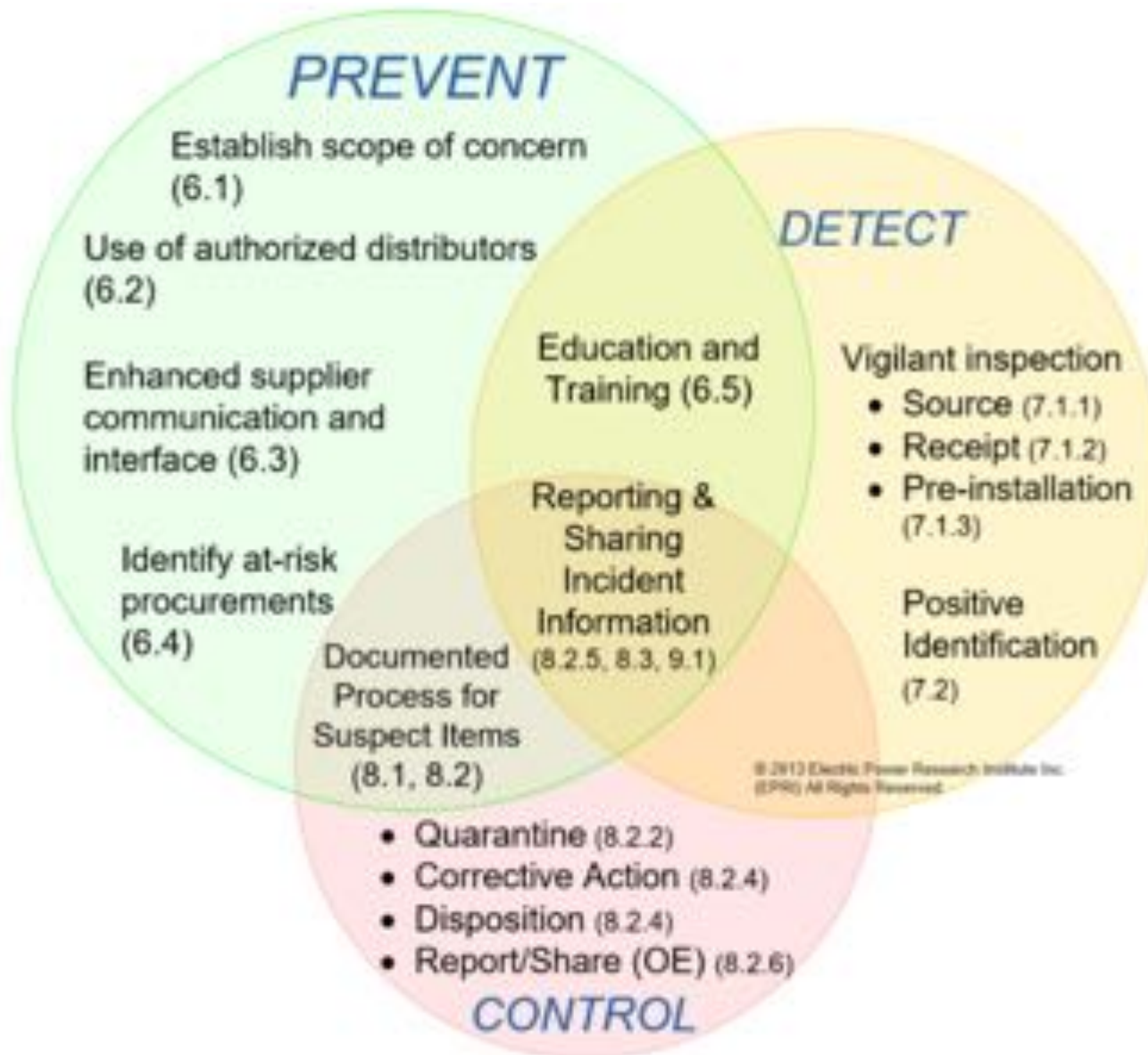
The big picture

- According to U.S. Immigrations and Custom Enforcement / U.S. Customs and Border Patrol [1]



[1] Intellectual Property Rights Seizure Statistics, U.S. Customs and Border Patrol

EPRI 3002002276 (Revision 1 of 1019163)



Prevention



© 2013 Electric Power Research Institute Inc. (EPRI) All Rights Reserved.



Detection

DETECT

Education and
Training (6.5)

Reporting &
Sharing
Incident
Information
(8.2.5, 8.3, 9.1)

Vigilant inspection

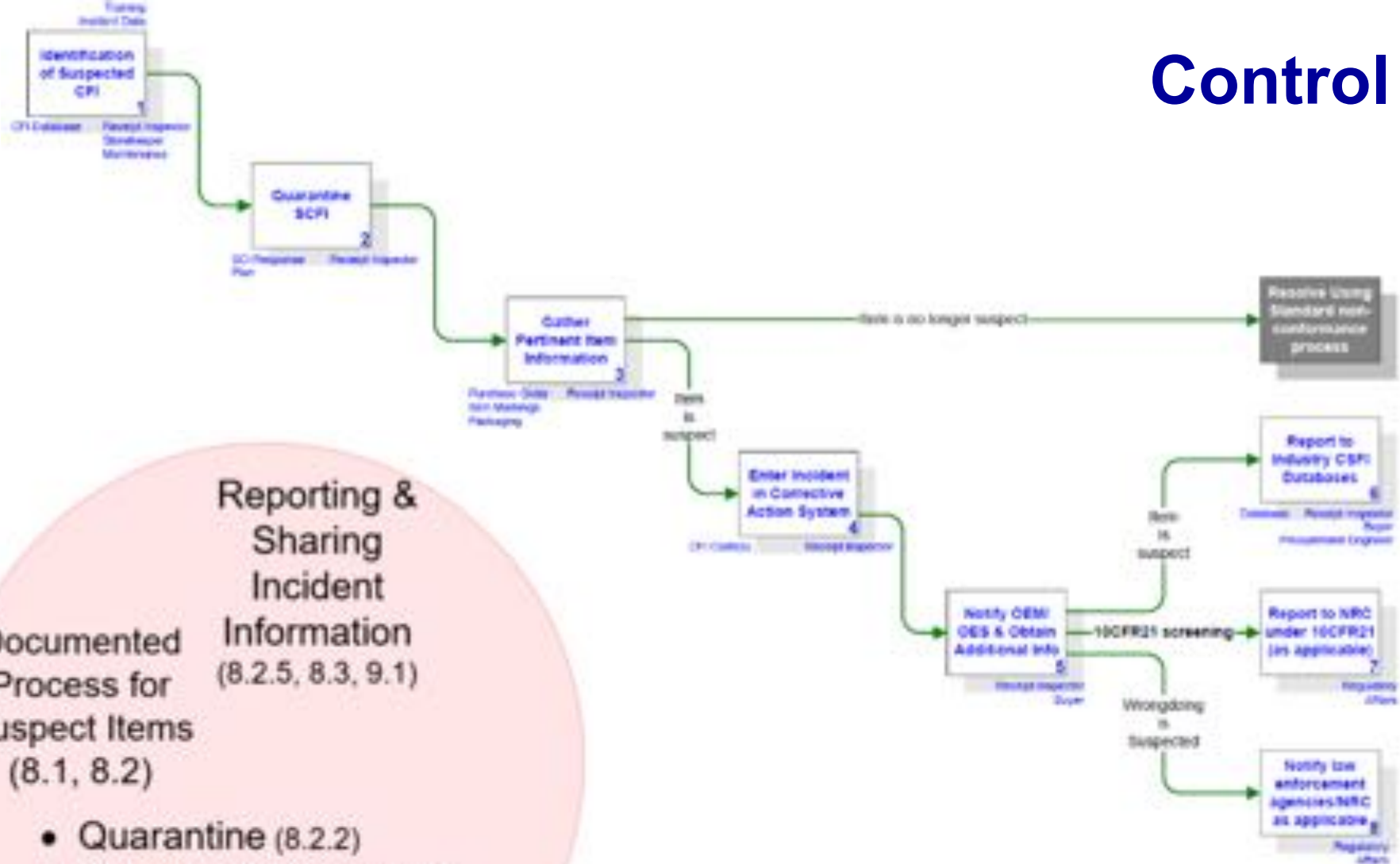
- Source (7.1.1)
- Receipt (7.1.2)
- Pre-installation (7.1.3)

Positive
Identification
(7.2)

© 2013 Electric Power Research Institute Inc.
(EPRI) All Rights Reserved.

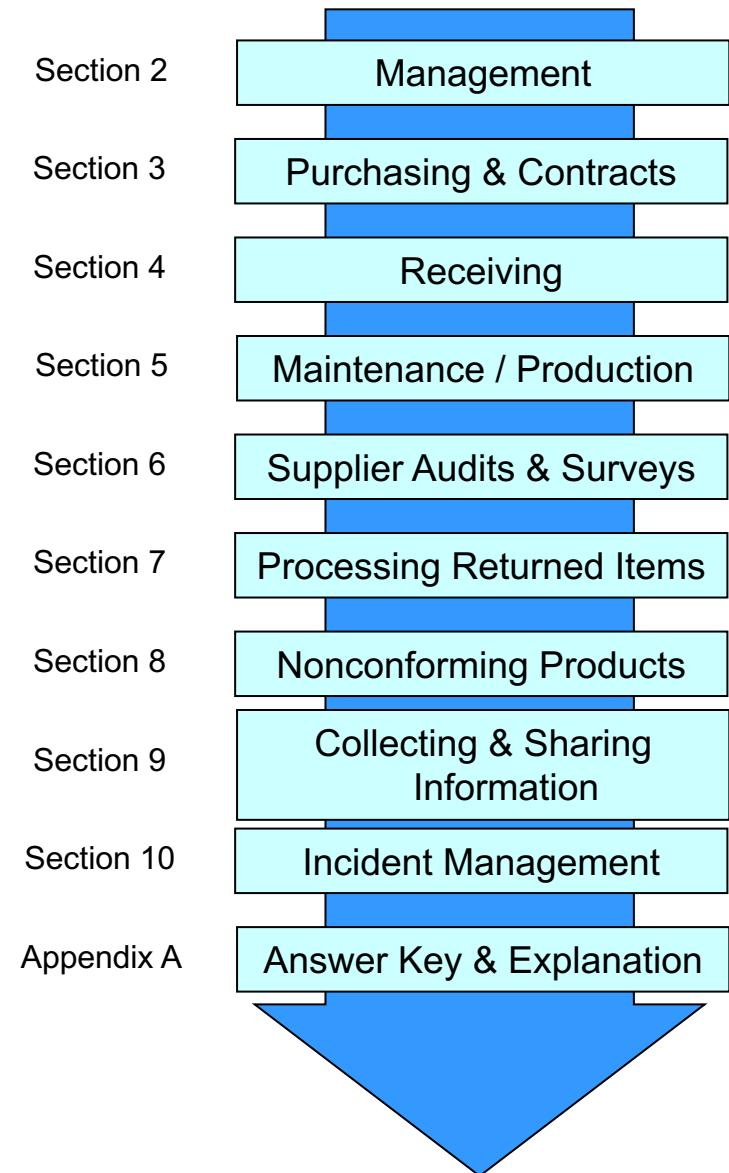


Control



How do I improve controls at my facility?

- EPRI 1021493, Self Assessment Checklist



Recommended Actions & Actual Actions Being Taken

Sham Beri

NRC Recommended Actions

- NRC Generic Letter 89-02 recommended (based on inspections of effective procurement / dedication programs):
- Engineering staff involvement in procurement / product acceptance processes
- Effective source inspection, receipt inspection, testing programs
- Thorough, engineering-based programs for review, testing, dedication of commercial grade items for suitability for use in SR applications
- Letter also conditionally endorsed EPRI Report NP-5652, "Guideline for the Utilization of Commercial-Grade Items in Nuclear Safety-Related Applications (NCIG-07)," issued June 1988.

NUPIC Recommended Actions

- **Implement NUPIC expectations – Checklist Rev.20 item 8.4**
 - Inspection / testing processes for identifying CFSI items, material, components that may not be those ordered, with indications such as:
 - Altered manufacturer's name, logo, serial number, manufacturing date
 - Items differing in configuration, dimensions, fit, finish, color
 - Markings on items / documentation missing / unusual / altered / inconsistent
 - Markings / documentation from country other than supplier
 - Items, sold as new, exhibit evidence of prior use
 - Performance inconsistent with specifications / certification or test data furnished
 - Documentation appears altered / incomplete or lacks expected traceability, UL or manufacturer's markings
 - Train Auditors and Receipt Inspectors
 - Use OEM / authorized agent / distributor whenever possible
 - Industry-wide sharing of experiences

Actions Being Taken by the US Government

- NRC, DOE, Federal Aviation Administration (FAA), Customs & Border Patrol / Immigration & Customs Enforcement (ICE), Department of Commerce, Department of Justice, Consumer Product Safety Commission (CPSC) and National Aeronautics and Space Administration (NASA) coordinating
- U.S. Department of Commerce, DOE, NRC may develop additional **Black Lists**
- Closing down a Chinese operation is a short-term achievement. Registering trademarks in China & in Chinese. Monitoring Chinese trading sites.
- Monitoring websites like “eBay” & “craigslist” (suspicious products / suspicious prices)

NRC Public CFSI Webpage Launched – Nov. 13, 2014

www.nrc.gov/about-nrc/cfsi.html

- Intended to help all interested parties quickly locate CFSI info
- Relating to NRC-regulated activities spanning a period of approximately 30 years
- Links to CFSI-related:
 - Guidance documents (e.g., INs, Bulletins, Generic Letters)
 - Background information
- Updated as new documents are generated
- Contains links to the [National Intellectual Property \(IP\) Rights Coordination Center](#), the Nuclear Energy Agency and IAEA, plus a link to report IP theft.

Actions Being Taken by the US Government (cont'd)



Intellectual Property (IP) Rights Coordination (IPR Center)

- Founded in 2000
- Serves as one of the U.S. government's key weapons in the fight against criminal counterfeiting and piracy
- Uses the expertise of its 23 member agencies (10 are shown on the next slide) to share information, develop initiatives, coordinate enforcement actions, and conduct investigations related to IP theft
- Approach to combat IP theft includes investigation, interdiction, and outreach and training
- **To report IP theft or to learn more about the IPR Center, visit <http://www.iprcenter.gov>**

Actions Being Taken by the US Government (cont'd) – STOPfakes.gov

- Intellectual property rights (IPR) protection / enforcement are critical to the success of U.S. businesses, including small and medium-sized enterprises (SMEs), and economy as a whole.
- U.S. Chamber of Commerce estimates IP intensive industries employ more than 55.7 million Americans.
- STOPfakes.gov was launched to serve as a one-stop shop for U.S. government tools / resources on IPR.
- Administered by the International Trade Administration's Office of Intellectual Property Rights

The Modern Day CFSI in our Society !

- You'd have to live under a rock not to have heard much about “**Fake News!!**”
- Generally, Fake News consists of stories that “report” on so-called facts and information that have no basis in fact, often with specifically fantastic headlines to encourage sharing on social media.
- **Fake News** stories cover the gambit of topics, much like real news — Politics yes, but also health, entertainment, gossip, arts and culture.
- Fake News can be more sensational than reality and lead to a high number of clicks, meaning that stories that get sufficient views can be very **profitable**.
- Fake News has been there for ever but only in the past year has it gained widespread notoriety in the U.S., largely due to the fact that the 2016 presidential candidates highlighted the issue!

Counterfeit, Fraudulent, and Suspect Items (CFSI)

Q & A ?

**For additional information
Please contact:**

1. Shamsheer (Sham) Beri:
Sham.Beri@pgn.com and/or
shamberi@aol.com
2. Tom Grace: TomAGrace@Eaton.com
3. Roger Moerman:
Roger.Moerman@atkinsglobal.com
4. Marc Tannenbaum:
mtannenbaum@epri.com

