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THE NEW STANDARD IN MAIL SECURITY

Enterprise Mail Security

Critical Risks + Practical Solutions

ASIS INTERNATIONAL Stronger Together

CPE Seminar, February 2021

Will Plummer, Chief Security Officer

Cody Martin, Director Mail Security

Alex Sappok, Ph.D., CEO

RaySecur Inc.

Presenters

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Will Plummer
Chief Security Officer

Retired U.S. Army EOD and Commanding Officer

Cody Martin
Director of Mail Security

Former U.S. Postal Inspector, Dangerous Mail Unit

Alex Sappok, Ph.D.
CEO

MIT Mechanical Engineering Dept. & RF Technology Spin-Out

RaySecur – New Standard in Mail Security

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Leading Mail Security Provider

- Cambridge, MA
- Mail threat detection
- Real-time analysis & support

The New Standard in Mail Security

Supporting

- Fortune 500 Corporations
- Government (defense, customs/border, police, etc)
- Heads of State
- High-profile individuals

US Department of Homeland Security
Qualified Anti-Terror Technology (QATT)

Agenda

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- **Mail-Borne Threats** - Prevalence and costs
- **Risk Assessment** - Evaluating organization risk
- **Prevention** - Newest technology for screening

Five Pillars of Mail Security

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- People
- Procedures
- Training
- Technology
- Emergency Response

Mail-Borne Threats

Types of Threats and Extent of the Problem

Mail Threats Stats

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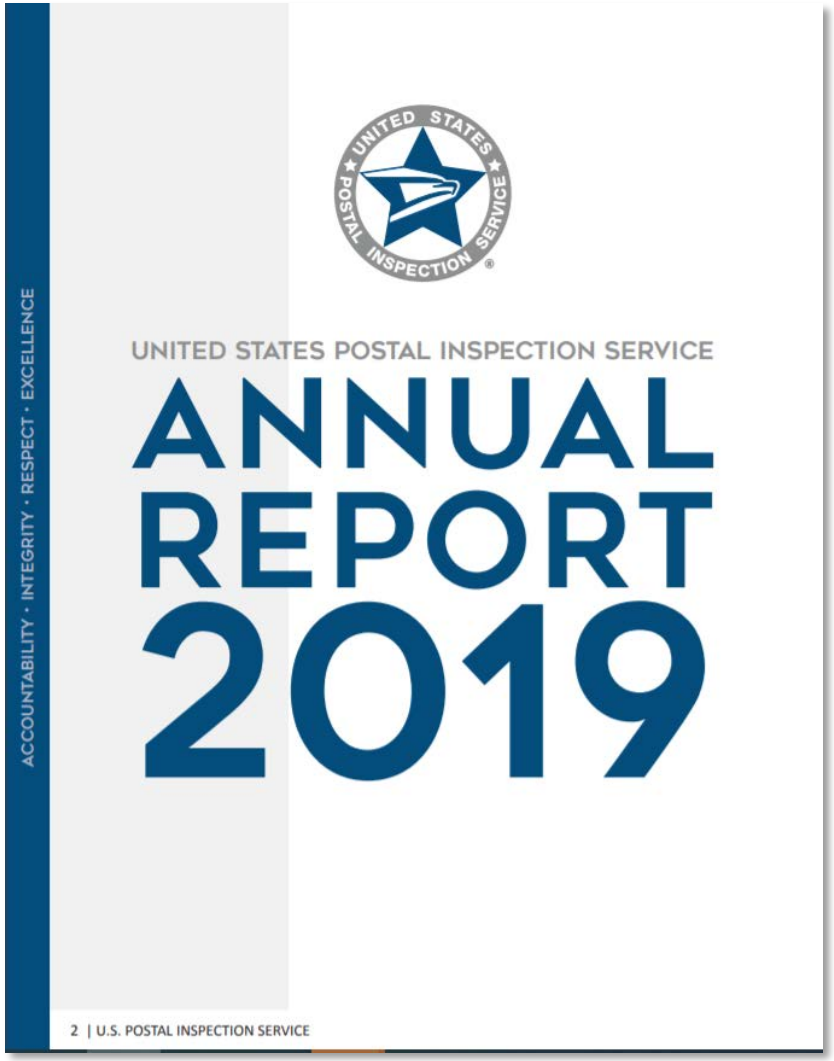
USPIS 2019 Annual Report

- Dangerous Mail Investigations (DMI) Unit
- 400 specially-trained inspectors
- 3,289 suspicious incidents (powders, liquids)
- 125,000 suspicious mail items subject to forensics exam

US Bomb Data Center

- 7,404 suspicious packages in 2018
- 2,261 incidents involving letters or parcels



https://www.uspis.gov/wp-content/uploads/2020/02/FY-2019-annual-report-508-web.pdf

Small Threats Lack Chain of Custody

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Most Mail Threats

1. Small to fit anonymous drop box
2. Lack chain of custody
3. Exhibit unusual characteristics

95% of Mail Threats in Small Packages

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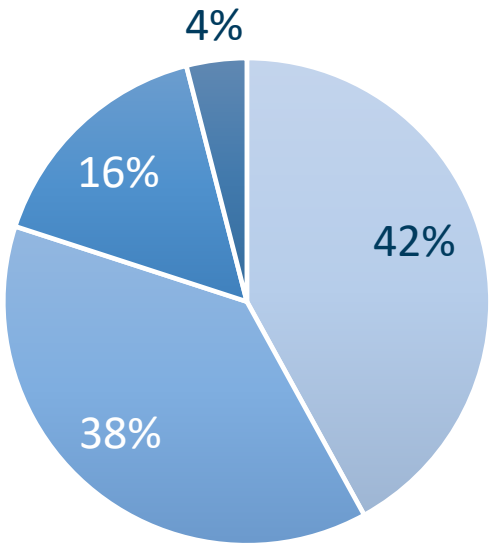
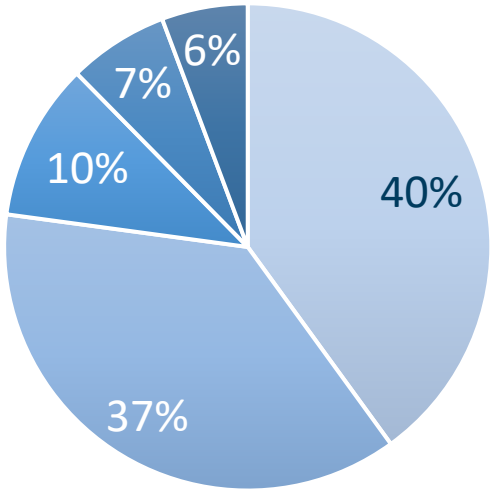
Threat Types



42% Drugs
38% White Powder
16% Other
4% Other Powders

Targets



42% Government
39% Private
11% Post Office
7% Corrections
6% Courts

95%

Small Packages

32% of known threats arrived in a letter envelope, and 63% via parcel — which could be mailed via USPS "blue box."

US PIS data

10 Dangerous Mail Incidents Every Day

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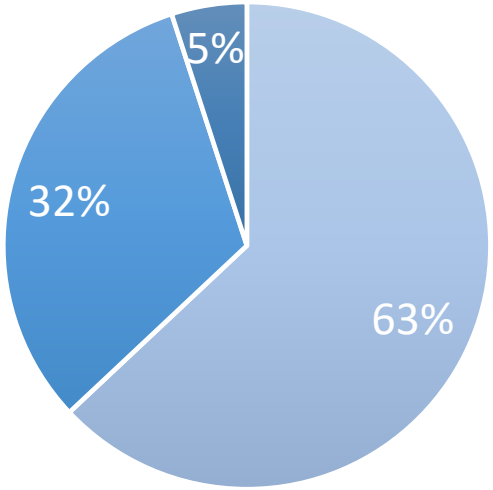
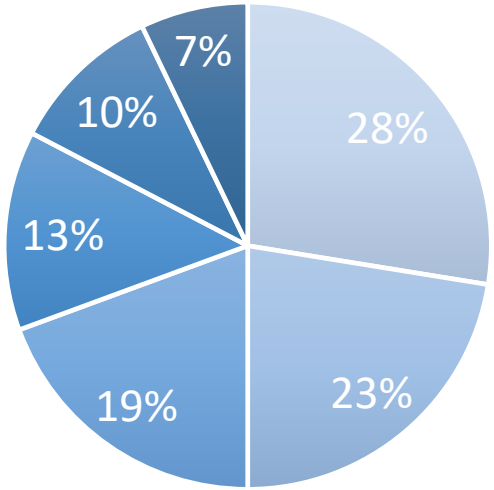
Container



63% Parcels
32% Letters
5% Unreported

Response



27% Hazmat
22% EOD/Bomb Squad
19% Sheriff
13% FBI
10% Local police
7% USPIS

3,289

USPIS Incident Responses in 2019

USPIS responds to 10 dangerous mail incidents every day, on average.

US PIS data

Case Study – Corporate HQ

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1 in 3

Fortune 500 Companies

receive at least one mail threat per year*.

https://www.uspis.gov/wp-content/uploads/2020/02/FY-2019-annual-report-508-web.pdf

2020 Shutdown Example

- ~200 Employees Work in HQ
- Approximately 20 on Site
- News outlets tied it to “Firings”
- Recent “problems” like Jared Fogel
- News agencies blamed Corporate

*Government Technology & Services Coalition, “Third of Companies Got Mail Threats in Past Year While Biological Screening Doubled,” May 19, 2019

Case Study – Government

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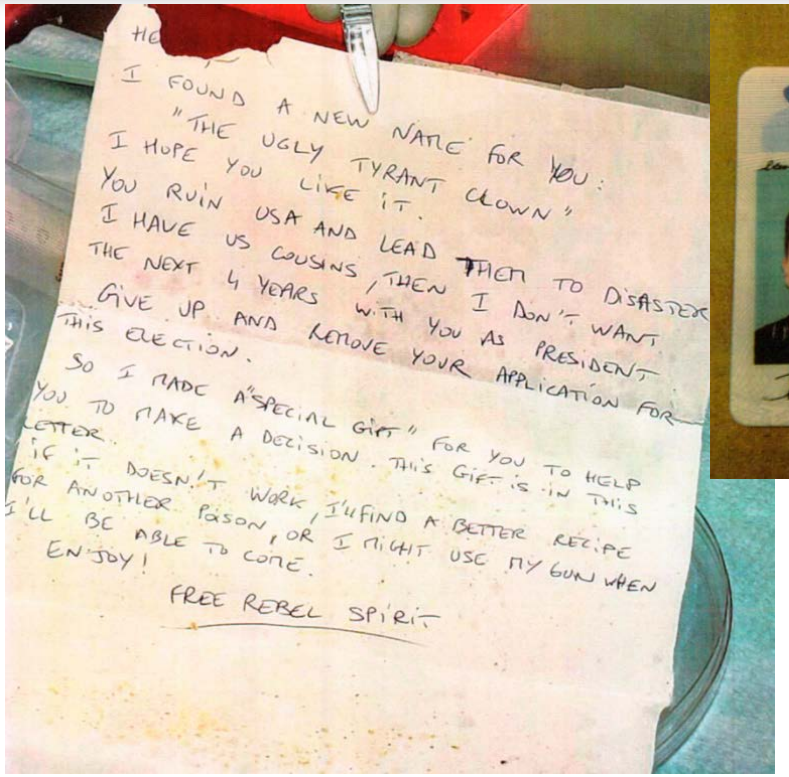
Washington DC, Sep 2020

- White House – 1 letter
- Texas – 6 Letters
  - Detention Centers
  - Law Enforcement HQs
- Federal Charges
  - Making Interstate Threats
  - Violating Prohibitions on Biological Weapons



Case Study – Election Mail-in Ballots

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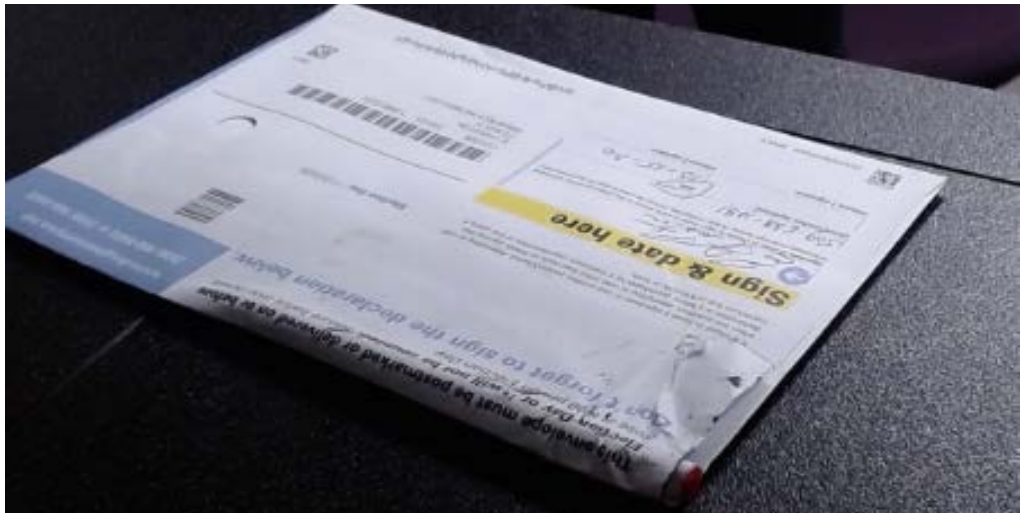
Multiple Cities

- Las Vegas, NV – Board of Elections
  - White Powder
- Baltimore, MD – NAACP
  - White powder & racist note
- Erie County, NY – Board of Elections
  - White Powder
- Grand Island, NE – Election Commission
  - 24" x 3" tube, blue liquid & electric pump
  - "F___ off, NOW" in reference to the "New World Order" written on a voter registration form.



Case Study – Bombs, IEDs, Hoaxes

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Netherlands Jan-Feb 2020

- 20+ parcels
- Multiple cities
- Extorsion/bitcoin
- Fraudulent return address
- Hissing + “bang”

Case Study – “Brushing” (Seeds, etc)

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All 50 States

- Fake ecommerce reviews
- Fake review, real name
- Federal Trade Commission
- Thousands of packages

Hundreds of Calls

- Follows all “Suspect Markings”
- Legitimate concerns
- Drained emergency services

Chain of Custody More Frequently Broken

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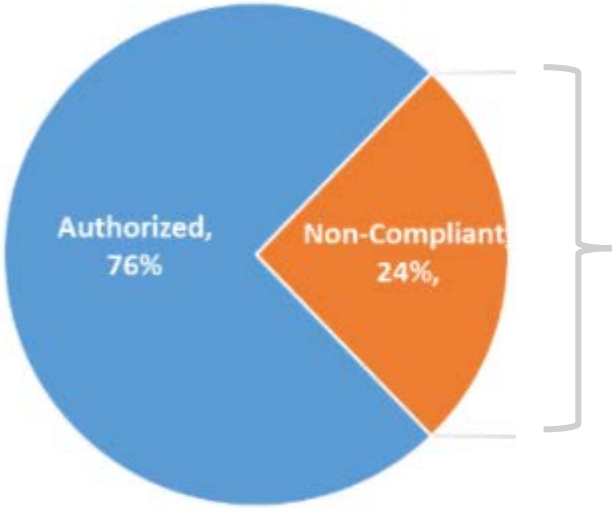
Image: United States Postal Service



https://truenorthcompanies.com/blog/transportation/solving-for-risk-in-the-last-mile-sector.aspx

Multi-Mode Last Mile Delivery

Potential for risk and complacency

- Crowdsourced providers
- Local currier services
- Automated technologies

NEW Threats Overlap Physical and Cyber

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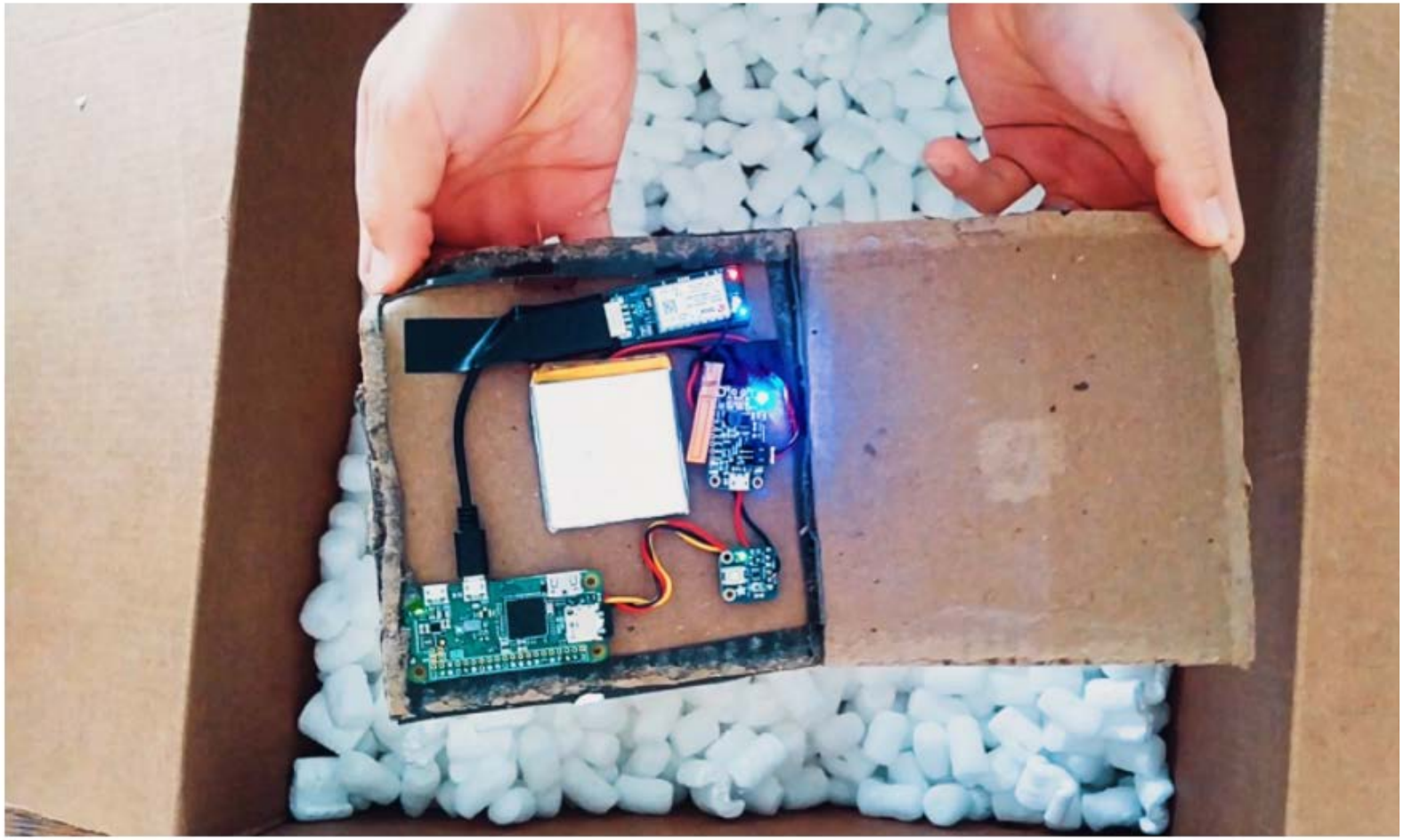
IBM Research Black Hat USA 2019



A warshipping device (Image: IBM/supplied)

Cyber Attack Vector

- WIFI + 3G hobby components for **less than $100**
- Shipped in the mail or concealed within items
- Provides physical network access point

Mitigation

1. Process mail quickly
2. Scan for anomalies
3. Discard packing

Initial Response Based on Worst Case

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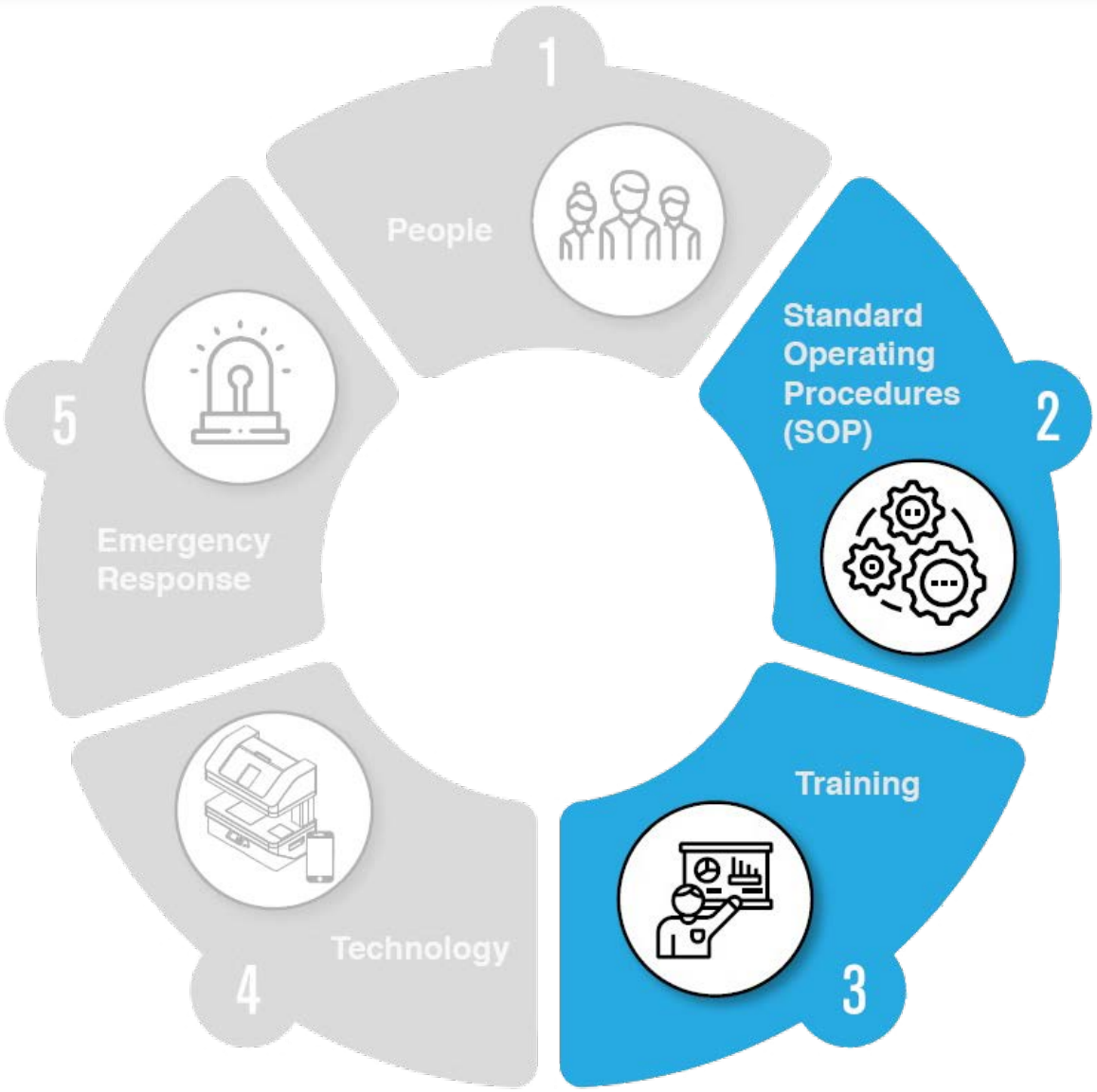
Probability

Types of Threats

- False Positive
- Hoax
- Chemical
  - Intentional
  - Accidental
- Hazardous Device
- Biological
  - Anthrax
  - Ricin

Severity



Mail Security Program

Key Concepts and Implementation

Five Pillars of Mail Security

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1. Leadership and Execution

- Internal security team
- External support resources

2. Standard Process

- Best practices
- Effective and actionable
- Disciplined

3. Education and Intelligence

- Reinforce SOPs
- Continually updated

4. Advanced Screening

- Right tools for the job
- Simple and easy to use

5. Response Plan

- Internal procedures
- External coordination

Leadership & Execution – Mail Security Pillar

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Internal Teams

- Executive Support
- Global Security
- Facilities Management
  - Outsourced Service Providers
- Mail Handlers

External Teams

- Subject Matter Experts
- On-Demand Support
- Incident Response

Standard Processes – Mail Security Pillar

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- Global Mailroom Security Policy Statement
- Global Mailroom Mail Screening Process
- SOP-001: Mail Security Screening
- SOP-002: Suspicious Item Screening
- SOP-003: Emergency Response

Broad Corporate Guidelines to Define Global Mail Screening Standards

- Appendix: Site-Specific Information

Site #1	Site #2	Site #...	Site #...	Site #...

Site-Specific Resources:
- Process Materials: Poster 84, RS Process Flow
- Trainings: LMS, On-Site Training, Quarterly Webinar
- Equipment: Screening Mat, MailSecur Scanner
- Support: EODSecur 24/7/365 Support

Site-Specific Information

Flexibility to Adapt as COVID Situation Evolves

Education & Intelligence – Mail Security Pillar

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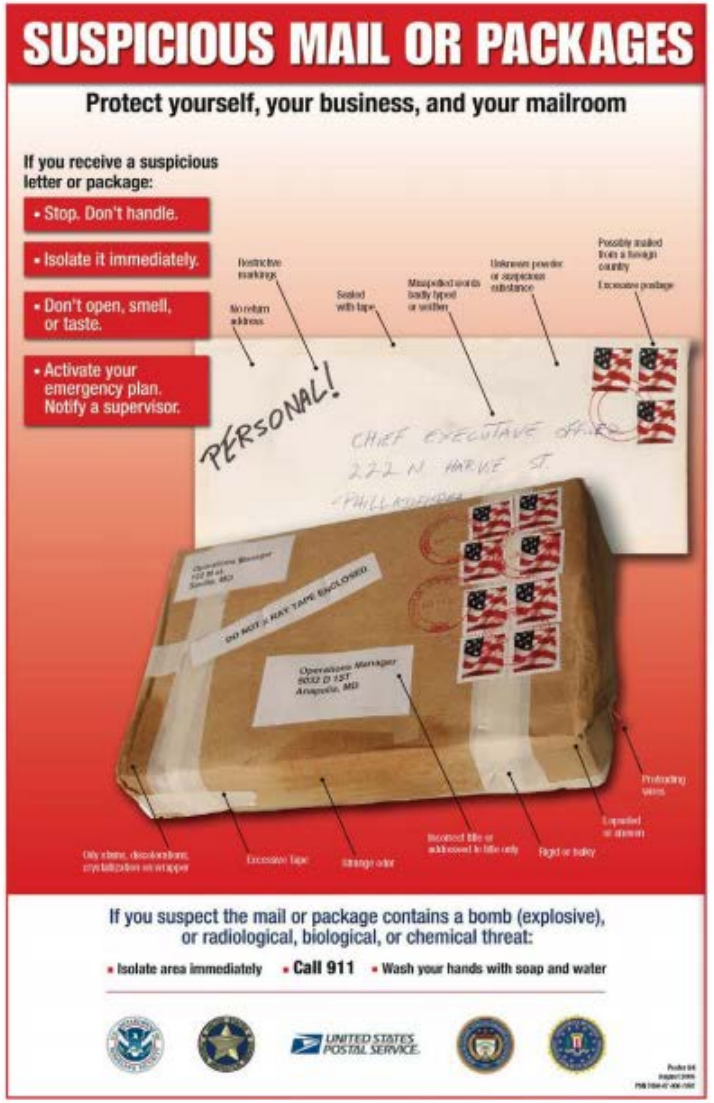
Training – Internalize SOPs

- Spans all layers of the organization
- Objective is to educate
- Incorporate training aids into everyday routines
- Continually update

Certification

- Confirm required level of understanding
- Require periodic recertification for key employees



Advanced Screening – Mail Security Pillar

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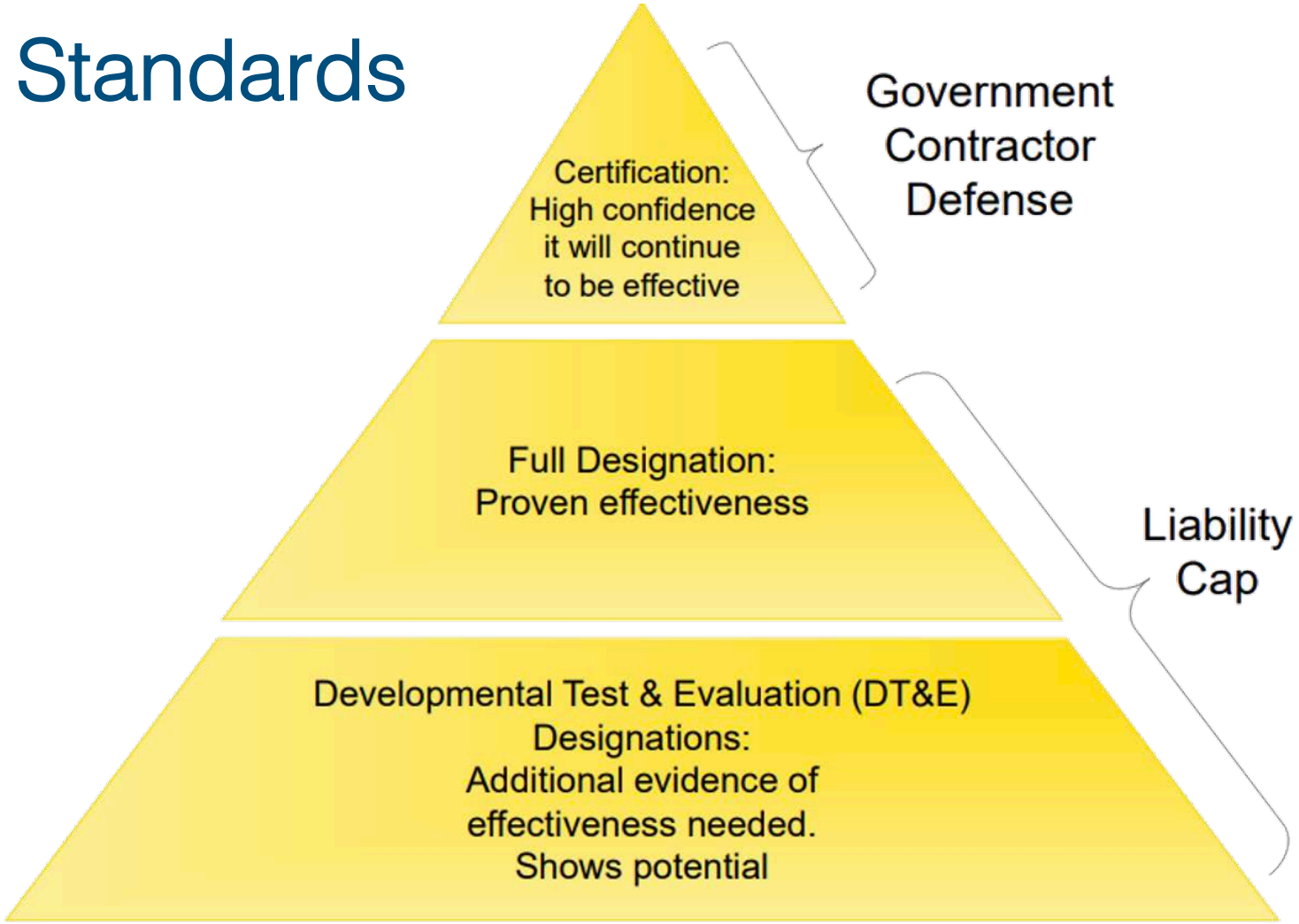
Validated Standards



https://www.safetyact.gov/externalRes/refDoc/refGroup/8/SAFETY%20Act%20101%20Briefing.pdf

Response Planning – Mail Security Pillar

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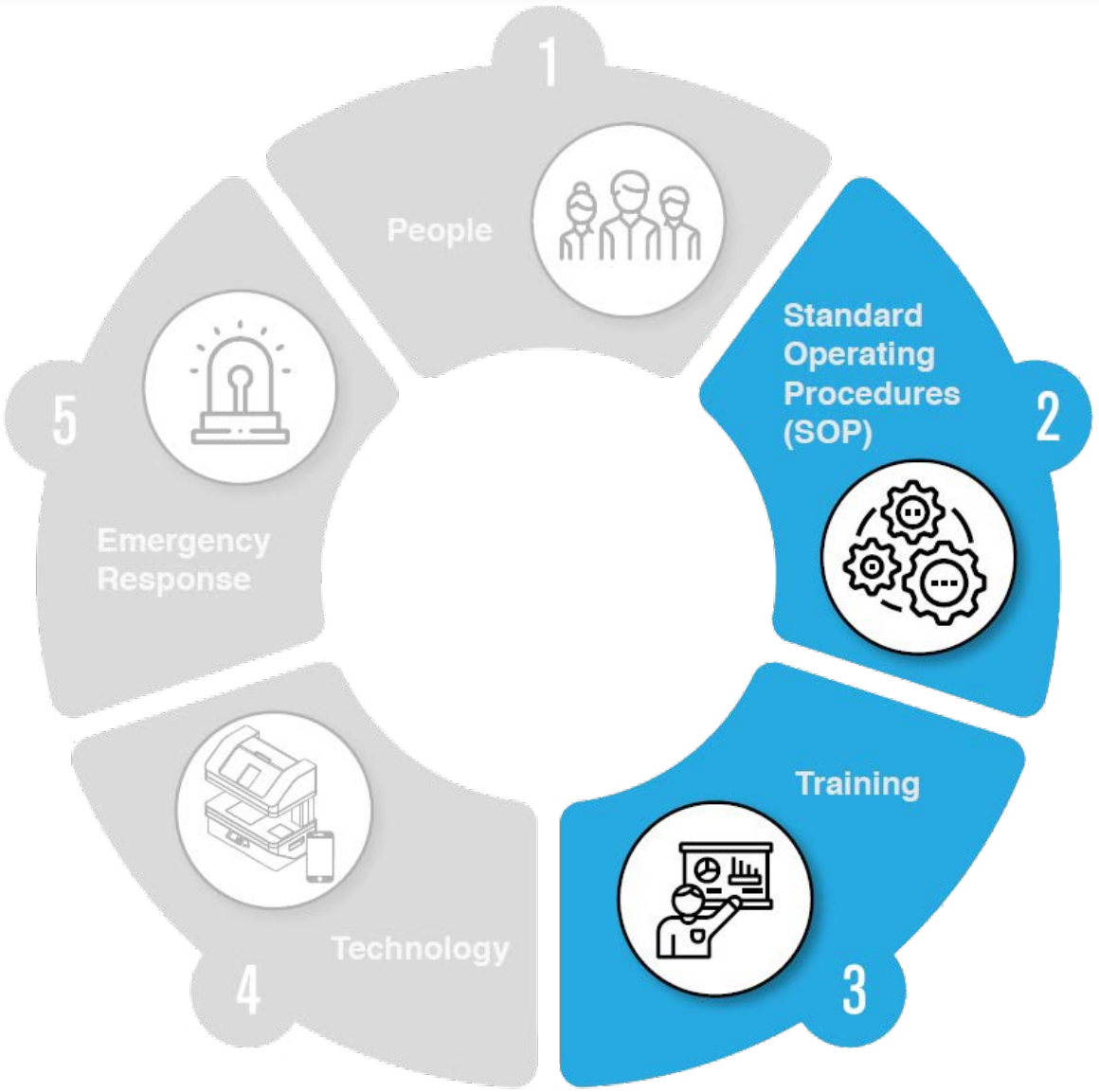
USPIS Response

- 4 hours
- Unmarked SUV
- Dangerous Mail Specialist
- Screen up through identification
- Resolve or escalate

Local (911) Response

- Faster response times
- Numerous personnel
- Evacuations
- Very similar mail screening equipment



Enterprise Risk Assessment

How to Evaluate Your Risk

Security Solutions Require Flexibility and Scale

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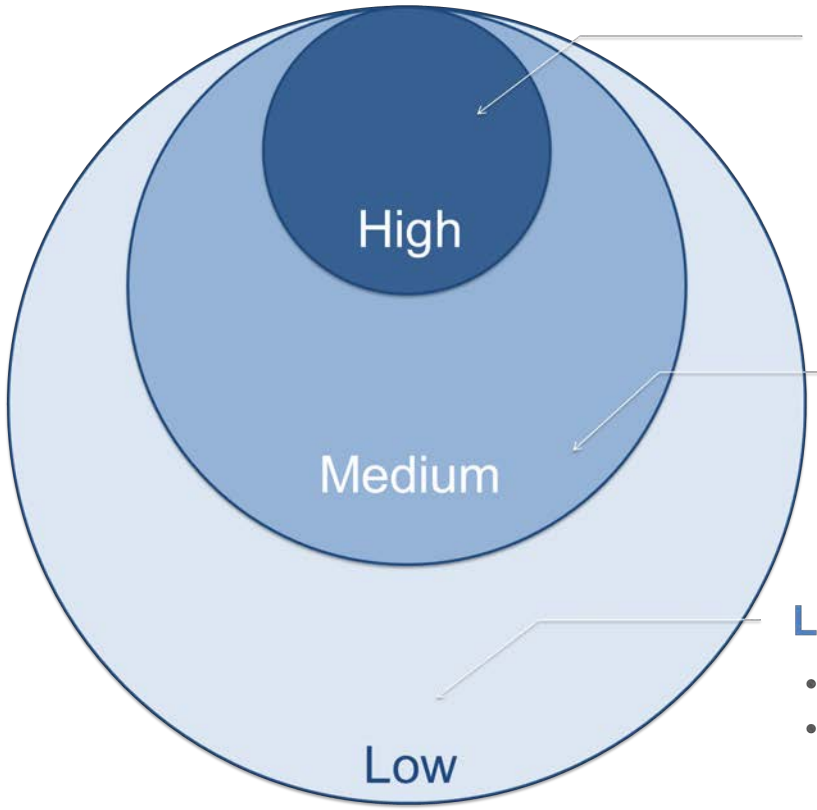
317 Locations for the Average Fortune 500 Company

Site Risk Profile Varies



High Risk

- Corporate HQ
- Critical Infrastructure
  - *Data Centers*
  - *Manufacturing Plants*
  - *Operations Center*
  - *Executive Protection*
- Public Figures

Medium Risk

- Satellite Offices
- Support Facilities

Low Risk

- Remote sites,
- Low profile sites

https://info.caprelo.com/blog/fortune-500-companies-international-expansion

US DHS High Risk Areas

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- Banking
- Energy / Power
- Defense
- Legal
- Chemical / Pharmaceutical
- Nuclear Facilities
- Transportation
- Health & Medical
- Telecommunications
- Construction
- Bio-Medical Research
- “Military Industrial Complex”

Risk Assessment Considerations

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- Symbolism
- Location
- Population

Risk Assessment “Intangibles”

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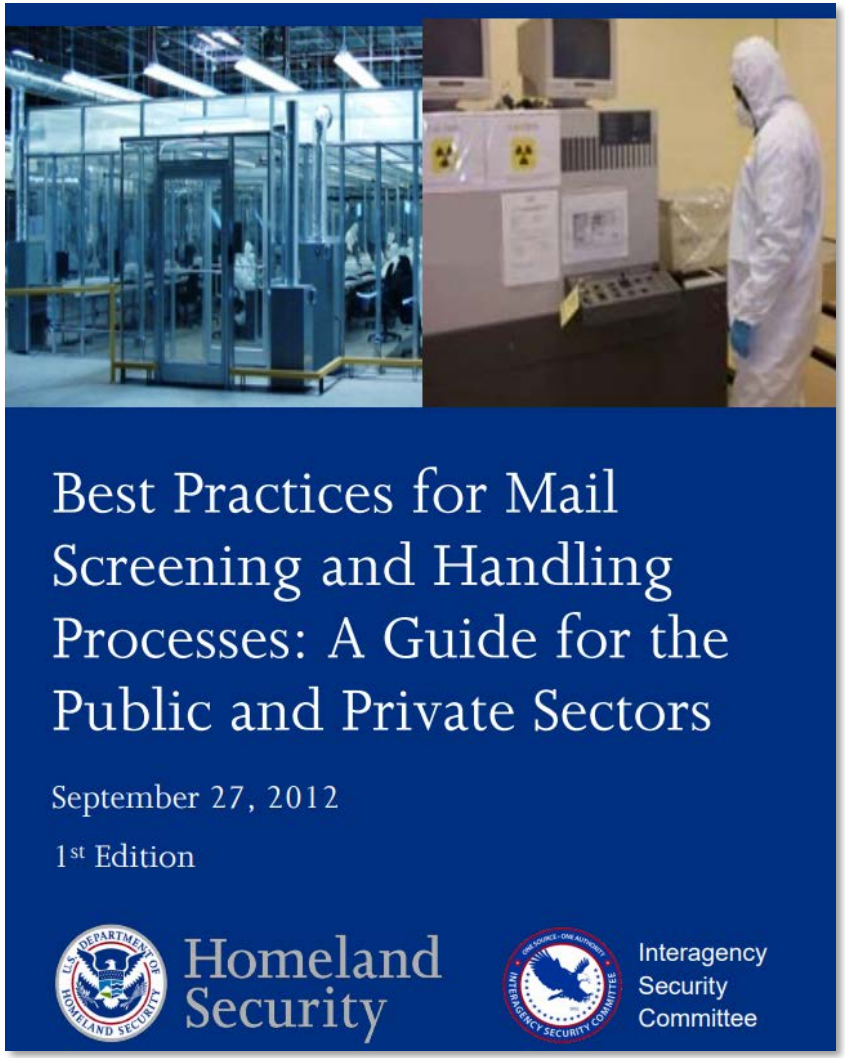
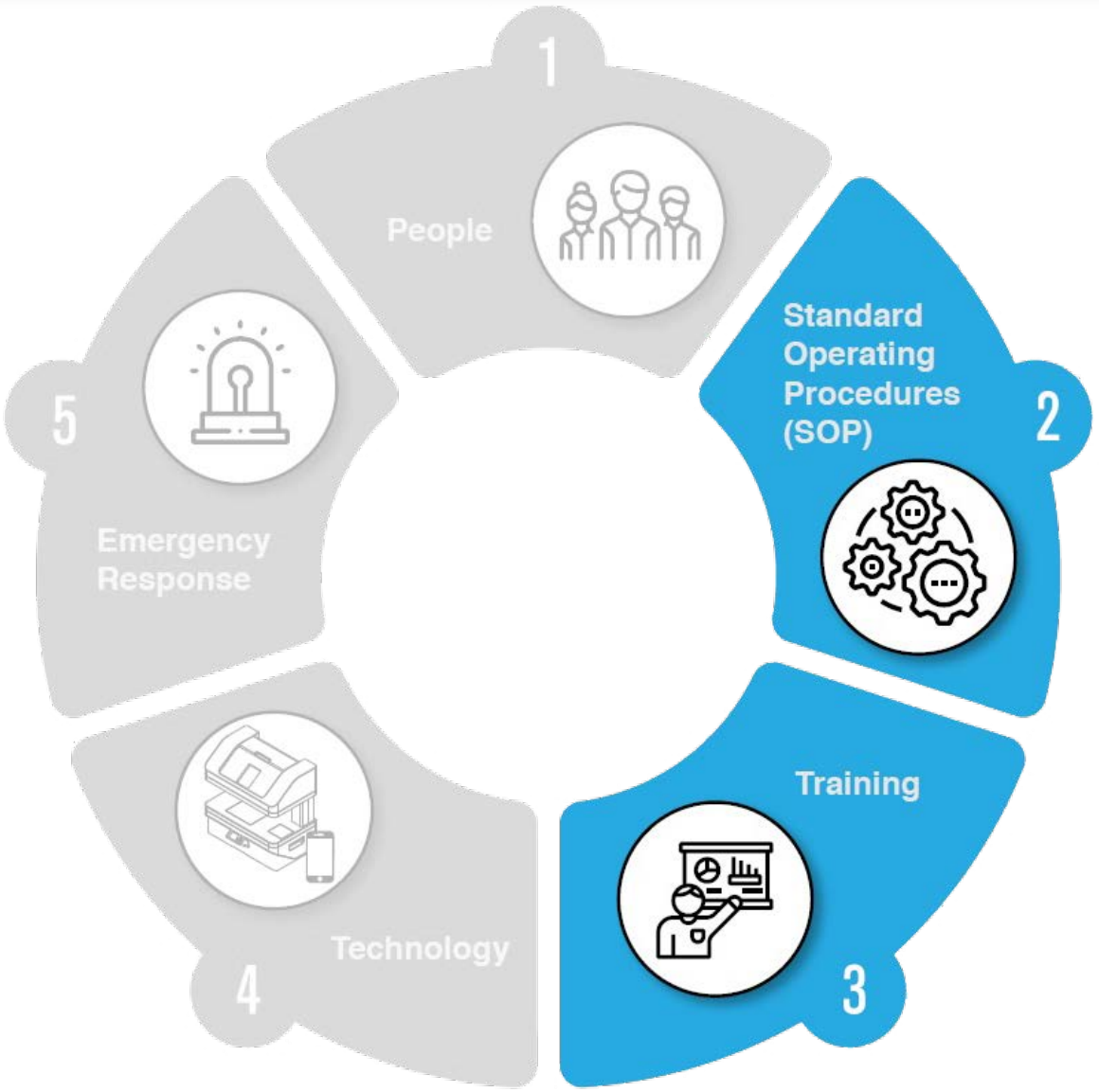
- Previous attacks
- Negative press
- Demonstrations, boycotts, labor disputes
- Disgruntled employees
- Facility layout
- Facility tenants
- Controlled vs. public access
- Loading dock
- Visibility (signage, lighting, advertising)
- Visitors





Enterprise-Level SOPs

How to Evaluate Your Risk

Standard Operating Procedures

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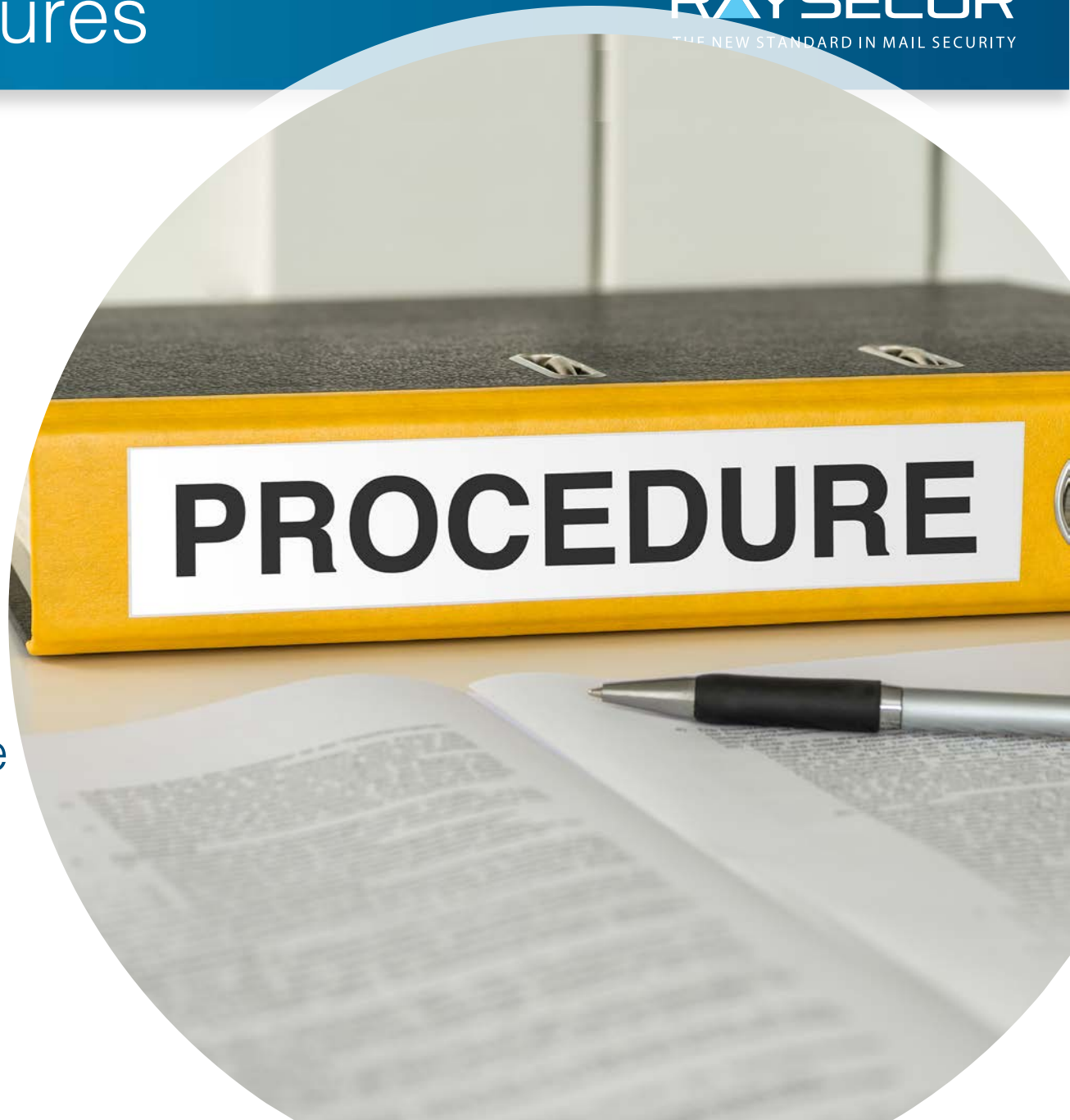
- Specify company-wide
- Global, not site-specific
- Individual sites added case-by-case
- All sites use global standards
- Site-specific SOPs based on risk profile



Mailroom Security Documentation

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Global Mail Screening Standards

- Global Mailroom Security Policy Statement
- Global Mailroom Mail Screening Process
- SOP-001: Mail Security Screening
- SOP-001A: Executive Protection Screening Standard Operating Procedure
- SOP-002: Suspicious Item Screening
- SOP-003: Emergency Response

Site-specific Appendix

Appendix: Site-Specific Information

Site 1 — Site 2 — Site 3 — Site 4 — Site 5 — Site 6

Site-Specific Resources:

- Process Materials: Poster 84, RS Process Flow
- Trainings: LMS, On-Site Training, Quarterly Webinar
- Equipment: Screening Mat, MailSecur Scanner
- Support: EODSecur 24/7/365 Support

DHS Mail Center Classification & Rating

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MAIL SCREENING REQUIREMENTS RATING

Facility Risk Rating	Mail Center Class A (Small)	Mail Center Class B (Medium)	Mail Center Class C (Large)
1	1A	1B	
2	2A	2B	
3	3A	3B	3C

MAIL CENTER CLASSIFICATION

	Daily Mail Volume	Staff	Number of Satellites
Class A – Small	< 1000	< 10	N/A
Class B – Medium	1000 -9,999	10 - 49	< 3
Class C – Large	10,000+	50+	3 or more

MAIL SCREENING BEST PRACTICES

FACILITY TYPE	VISUAL SCREENING	DANGEROUS CONTRABAND	HOAX SCREENING	EXPLOSIVE SCREENING	CHEMICAL SCREENING	BIOLOGICAL SCREENING	RAD/NUKE SCREENING	CONTENT SCREENING
1A	X	X	X					
1B	X	X	X					
2A	X	X	X	X				
2B	X	X	X	X				
3A	X	X	X	X	X	X	X	X
3B	X	X	X	X	X	X	X	X
3C	X	X	X	X	X	X	X	X

Best Practices in Anti-Terrorism Security

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- Mail room or loading dock only
- Verify registration before accepting
  - Hold courier ID
  - Monitor critical areas
- Electronic surveillance
- Reduce accessories
- Independent HVAC zones

https://bpatsassessmenttool.nibs.org

Mail Room Security Practices

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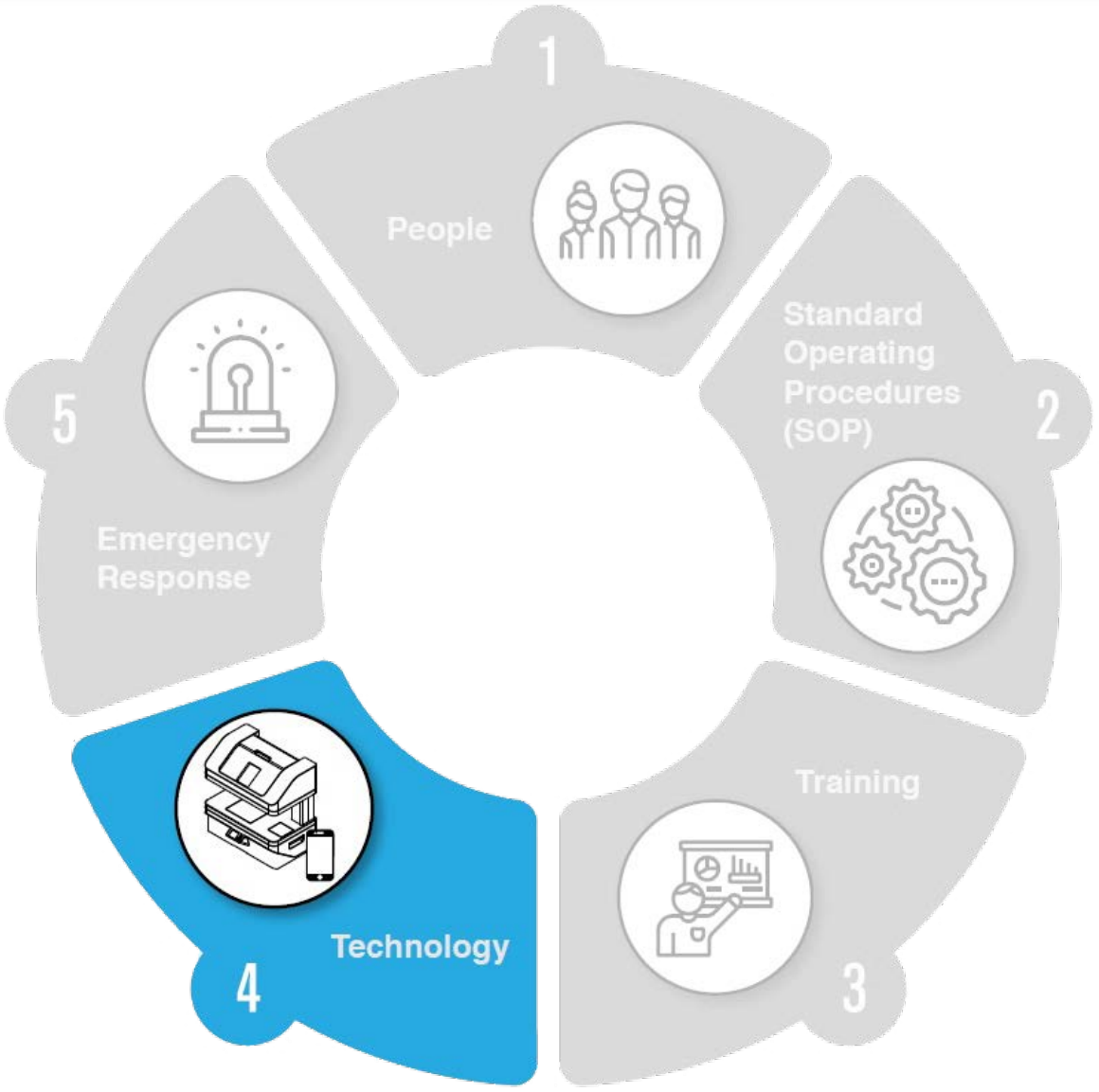
- Away from main entrances & infrastructure
- Off-site or at perimeter
- No deliveries during peak business hours
- Screen all packages
- Separate mail room ventilation
- CBRN detection & isolation equipment
- Train on suspicious mail & deliveries
- Provide PPE

https://bpatsassessmenttool.nibs.org



Screening Technologies

Advanced Technologies to Counter Today's Threats

Common Types of Mail Threats

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Dangerous Items

Needles, razor blades, guns, knives, and lithium ion batteries are just a few of the items that could hurt recipients or mail handlers.

Explosives

In just one 10-day period in 2018, 16 pipe bombs were mailed to prominent Democratic Party politicians and President Trump.

Contraband

Many companies have found illegal drugs being sent to employees through the USPS and internal mail.

Powders

Five people were killed by letters containing anthrax in 2001; since then white powder has been commonly used as a mail-borne threat.

Liquids

Acids, tear gas, and other liquids can cause havoc and injury if released in a workplace.

Chemical

Many chemicals used in industrial applications are dangerous and readily available for purchase and shipping by bad actors.

Biological

Biological threats include microorganisms, viruses, and toxins that can harm humans.

Nuclear

If radioactive materials were to be released in a workplace, they could seriously harm people and render the facility permanently unusable.

Traditional X-Ray ***Not Visible by X-Ray in Typical Quantities Found in Most Mail Threats**

Detection vs. Identification

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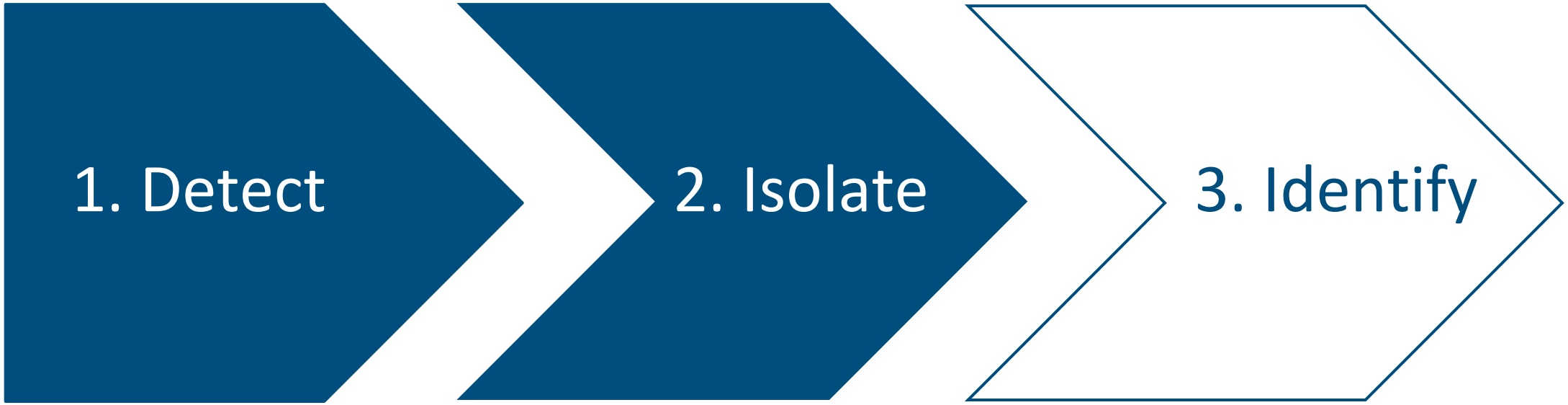

Corporate

- Visual and tactile
- X-ray imaging
- mmWave imaging
- K9 teams

- Confirm & de-escalate
- Initiate response

Law Enforcement

- Spectroscopy
- Chromatography
- Wet chemistry
- Bio-assays
- Chem / bio sensors
- Explosives analyzers

Mail Screening Technology Mismatch

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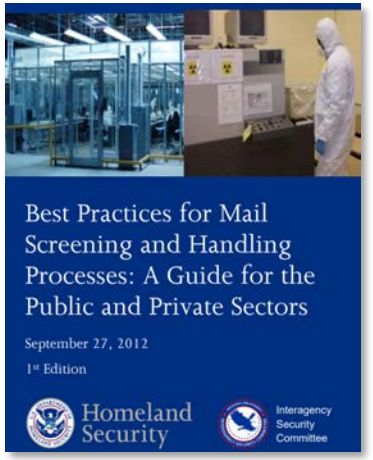
Table 5-1. Common Screening Technology Applications

SUBSTANCE	VISUAL INSPECTION	AUTOMATIC SENSORS	HANDHELD SENSORS	CANINE TEAMS	X-RAY SCANNERS	AIR SAMPLING SYSTEMS	CDC LRN* Tests	AUTOMATIC BIO ID SYSTEMS
Chemical	X	X	X			X		
Biological	X	X	**			X	X	X
Radiological		X	X					
Nuclear		X	X					
Explosives	X	X	X	X	X			
Dangerous Items	X				X			
Contraband	X		X	X	X			
Suspicious powders	X						X	
Threatening Content	X							



https://www.cisa.gov/sites/default/files/publications/isc-mail-handling-screening-nonfouo-sept-2012-508.pdf

UK Mail Security Guidelines

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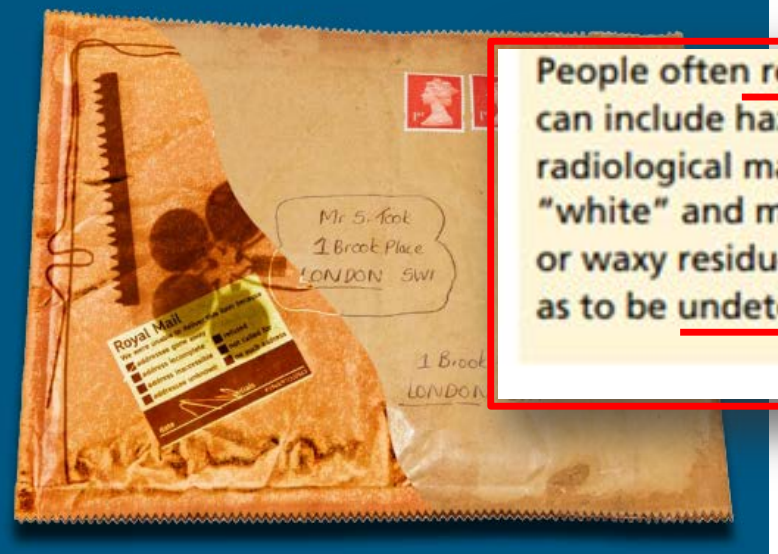
Introduction to **PAS 97**:2015

Mail screening and security – Specification



CPNI
Centre for the Protection of National Infrastructure

bsi.

Screening levels

A key component of PAS 97 is a series of screening levels.

Generally, the greater the commitment of resource and effort to mail screening, the greater the protection that is likely to be achieved. It is, however, important that the organization achieves an appropriate level of screening, balancing the threat it faces with the need for operational efficiency, whilst having the flexibility to adapt screening in response to changes to the threat or the requirements of the organization's business.

It might be appropriate to apply different levels of screening to different mail streams, to reflect the different risks associated with the various streams.

People often refer to **"white powders"** in the context of postal threats. These can include hazardous chemical (including explosive or narcotic), biological or radiological materials, as well as benign materials. Such materials may not be "white" and may not be "powders"; materials may be crystalline (e.g. sugar), oily or waxy residues, or liquids, and might be present in sufficiently small quantities as to be undetectable by typical X-ray-based screening processes.

- knives;
- blades and other sharp items, (e.g. syringe needles, broken glass);
- offensive material (e.g. faeces, urine);
- bulk chemicals – toxic, corrosive or otherwise harmful, including narcotics;
- bulk biological materials;
- bulk radiological (radioactive) materials.

People often refer to **"white powders"** in the context of postal threats. These can include hazardous chemical (including explosive or narcotic), biological or radiological materials, as well as benign materials. Such materials may not be "white" and may not be "powders"; materials may be crystalline (e.g. sugar), oily or waxy residues, or liquids, and might be present in sufficiently small quantities as to be undetectable by typical X-ray-based screening processes.

Level	Screening method	Protection afforded against		Measures common to all screening levels
		Discrete threat objects and bulk materials	"White powders"	
(0)	No screening, other than general staff awareness of postal threats	Low	Very low	The chosen screening level(s) shall be implemented in combination with physical protective measures appropriate for each activity being conducted (see Clause 6). Staff shall be suitably trained and shall be deemed competent to carry out the screening activities. Emergency procedures shall be initiated if at any point during screening an item is considered suspicious. PAS 97 provides actions that are recommended upon discovery of any suspicious delivered item.
1	• External visual inspection of every item. • X-ray anything of concern, especially larger items (packets, parcels, etc.).	Moderate	Low	
2	• X-ray all items in bulk/large batches initially. • X-ray again individually or in smaller batches if anything anomalous is observed	Very good to excellent	Low	
	ery item. e any move to resence nalous, ging ng, ve	(Negligible further benefit)	Low to moderate	
	ery item. of the tap ers or to move to that corner, and inspect visually for presence of any such anomalies. • For any items identified as anomalous, open side of envelope or packaging by cutting, and without removing, examine contents visually; remove contents.	(Negligible further benefit)	Moderate to good	
5	Level 2 followed by: • External visual inspection of every item. • For each item, open side of envelope or packaging by cutting, and without removing, examine contents visually; remove contents if satisfied safe to do so; inspect outer wrapping and contents for any further evidence of powders and other anomalous items or materials.	(Negligible further benefit)	Very good	

https://www.cpni.gov.uk/system/files/documents/3f/b7/Introduction-to-PAS-97-2015.pdf

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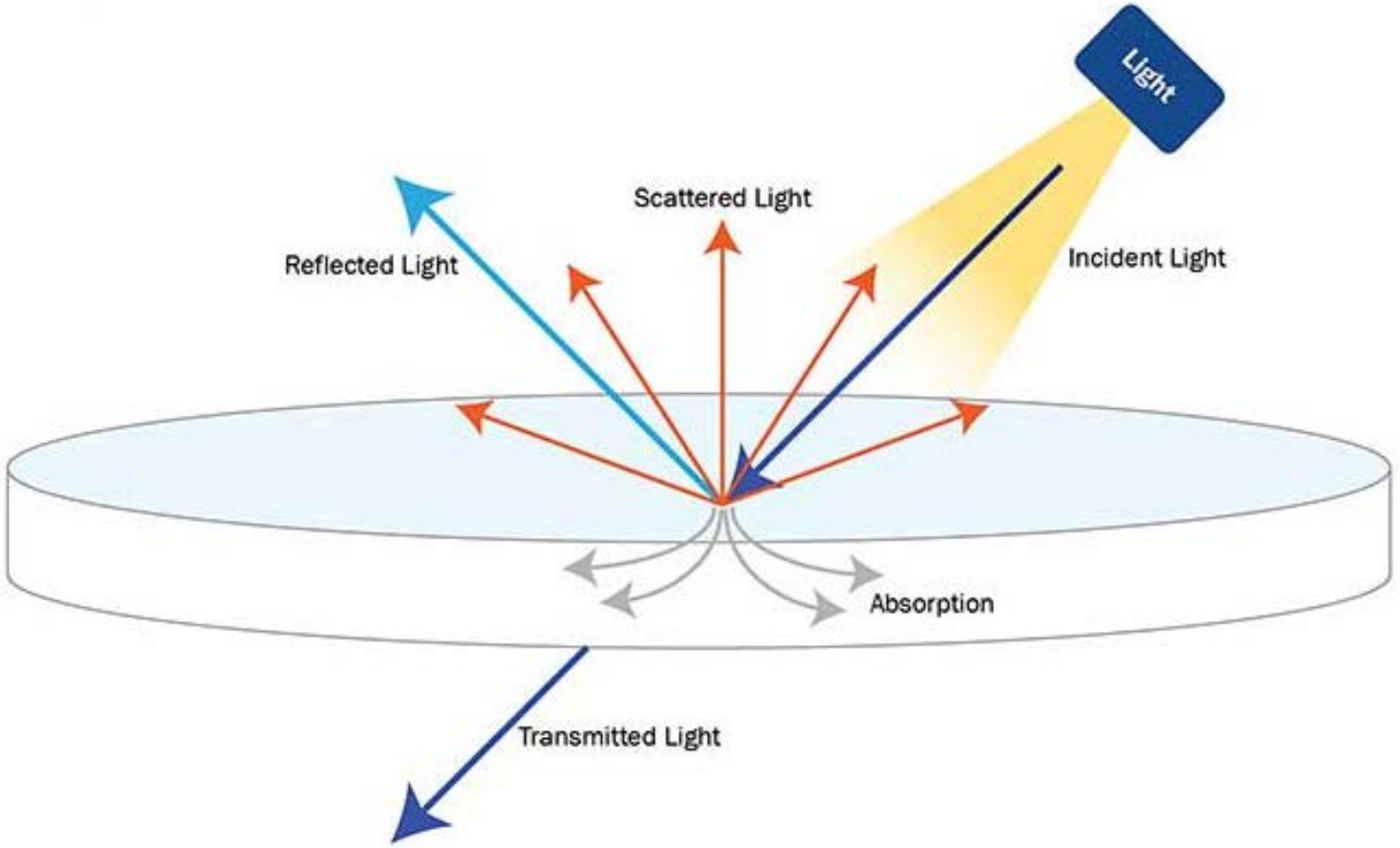
Visual Imaging

Reflection and Transmission



Other Applications

Example: Ultrasound

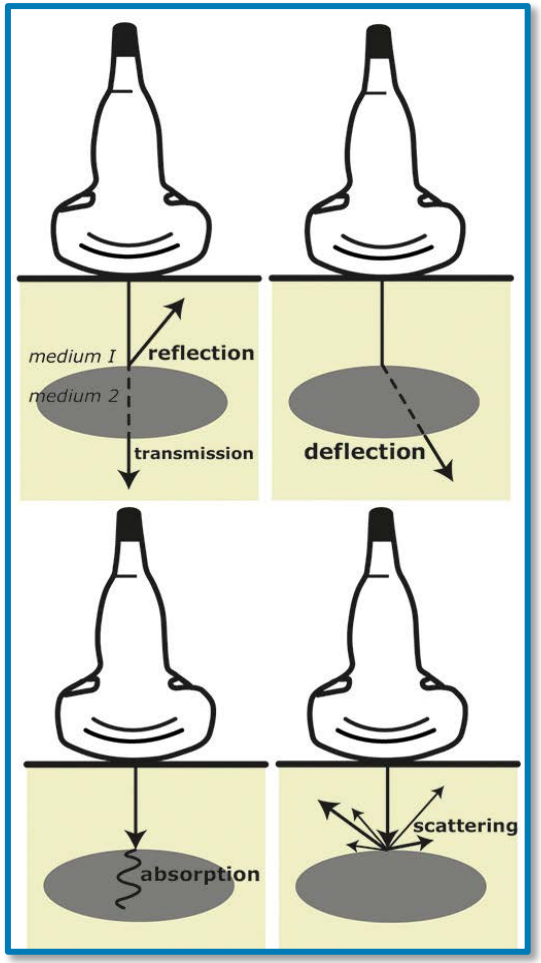


Image Source: https://www.photonics.com, https://www.startradiology.com

Electromagnetic Spectrum

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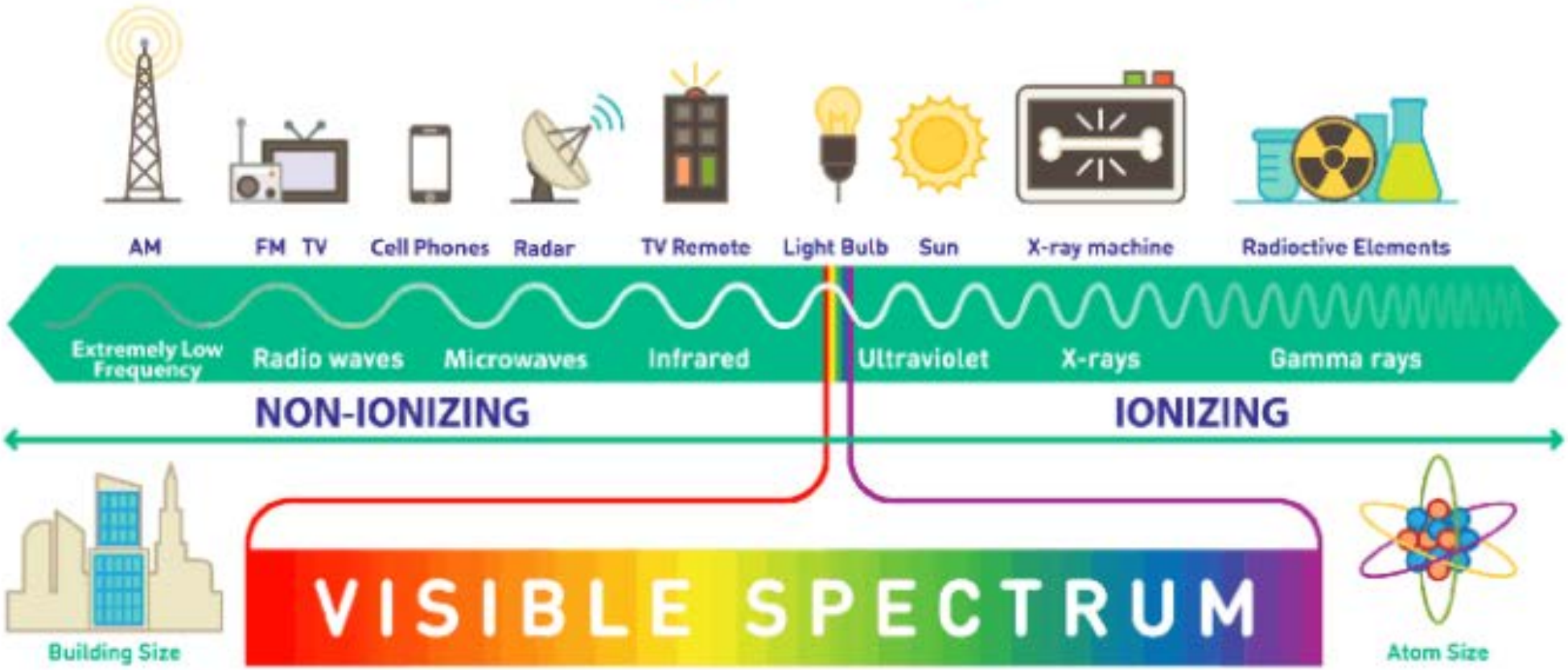

Image Source: medium.com

Non-Invasive Imaging Based on Wavelength

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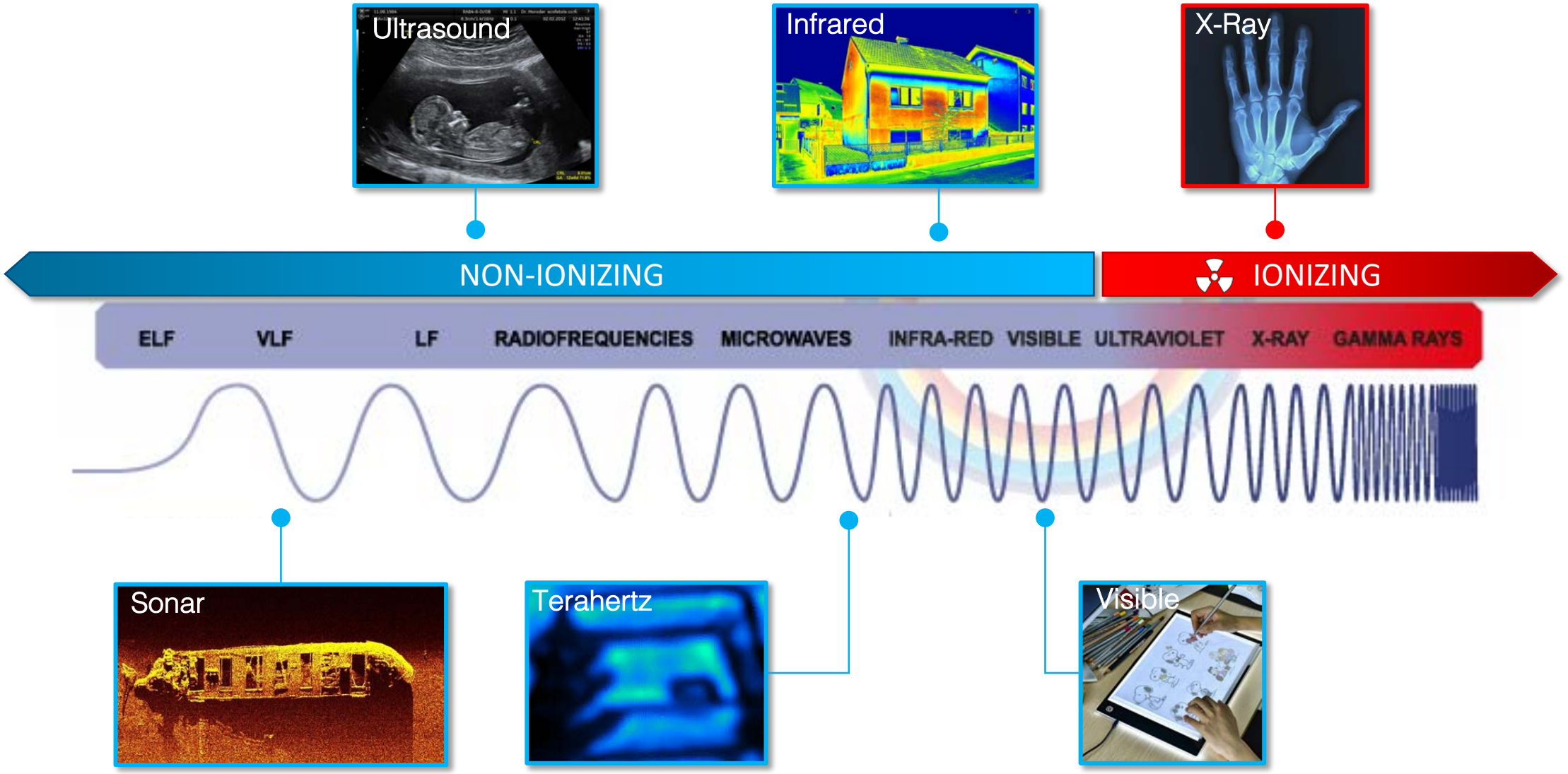

Image Source: baesystems.com

Millimeter Wave Real-time Video

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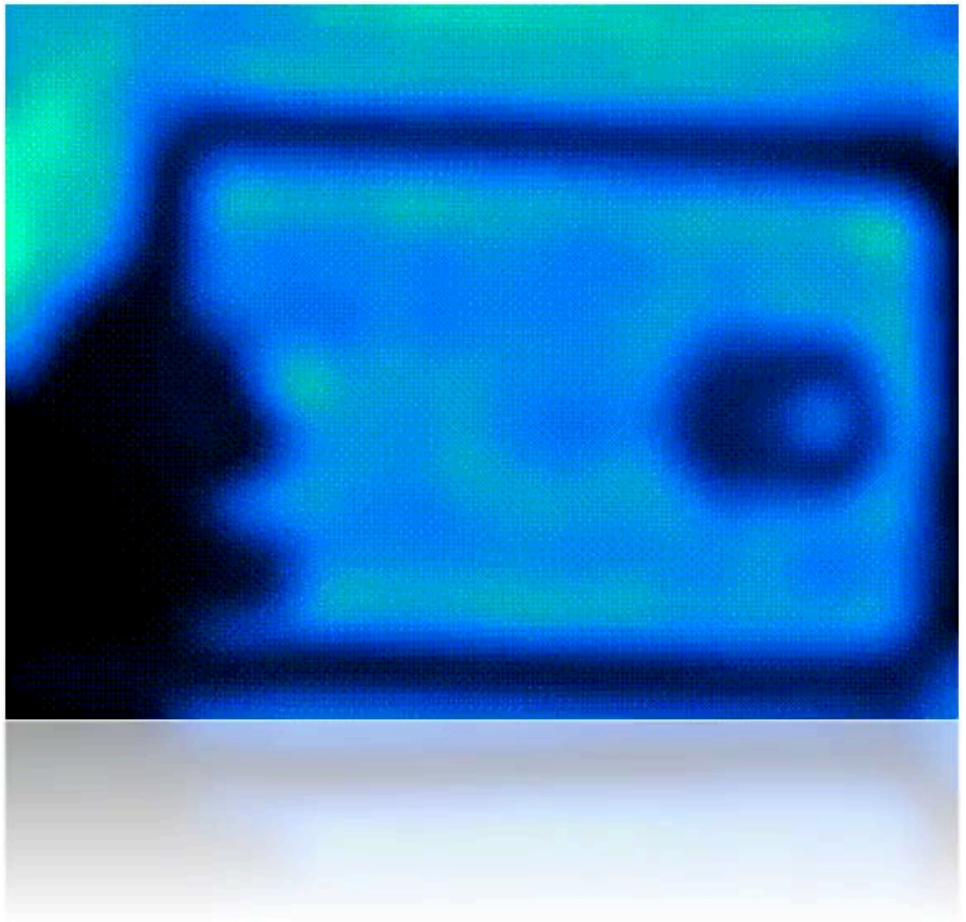

mmWave (THz) Imaging Technology

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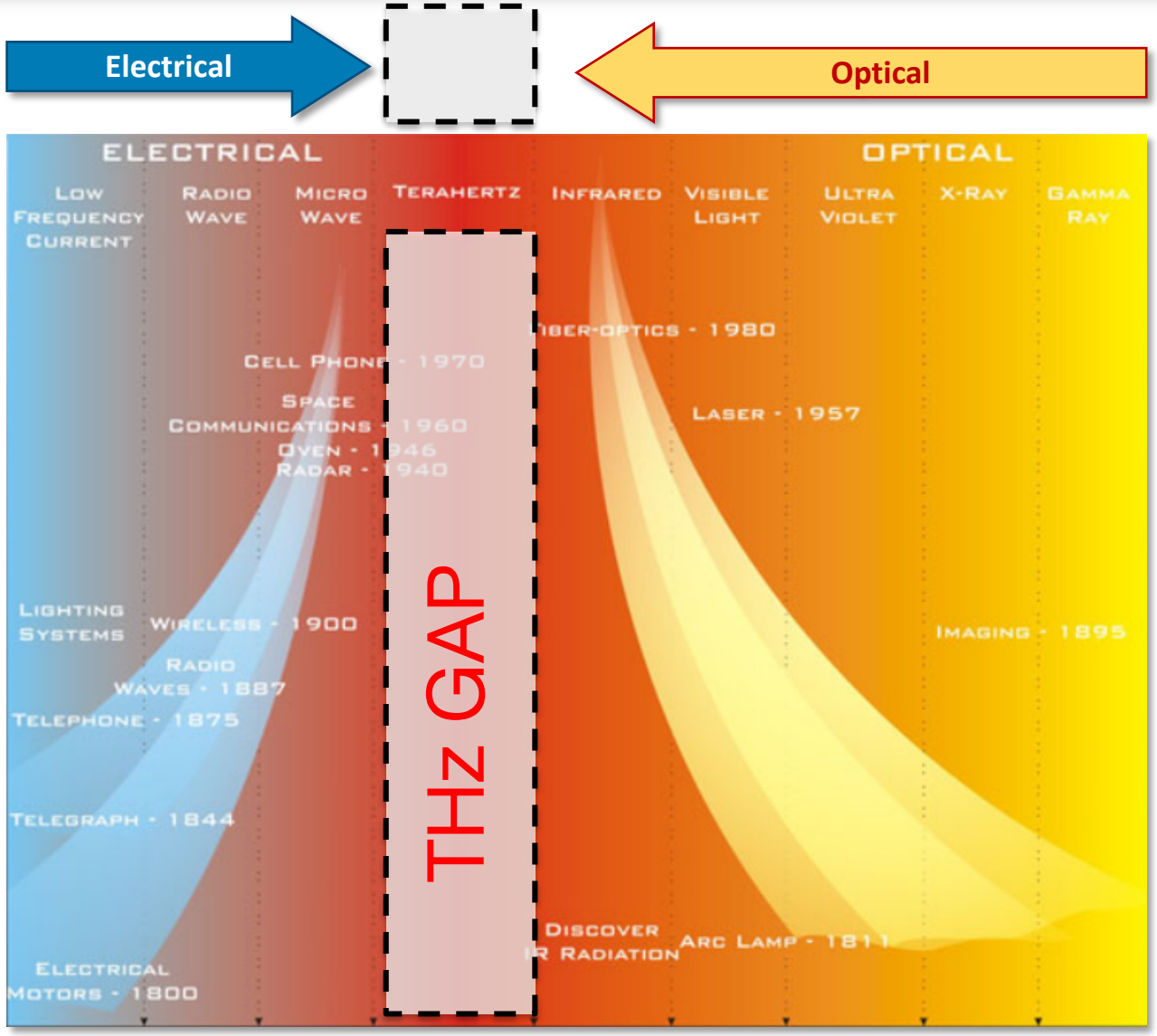

Image Source: https://teraphysics.com

Satellite Applications

Security Imaging

Advantages

- Safe to use
- Dynamic imaging
- Direct feedback
- Easy to deploy

Advanced Technology Mail Screening

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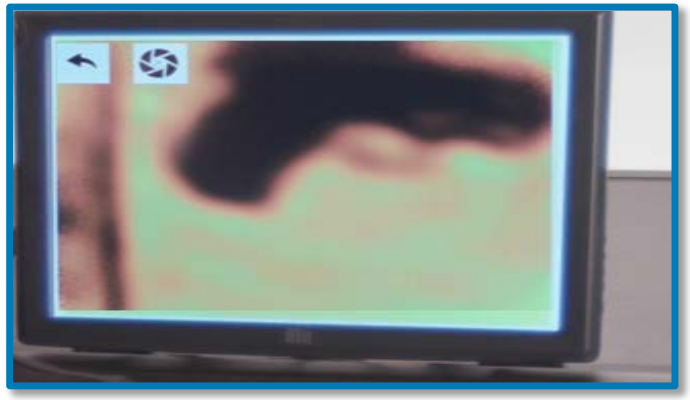
Advanced Imaging

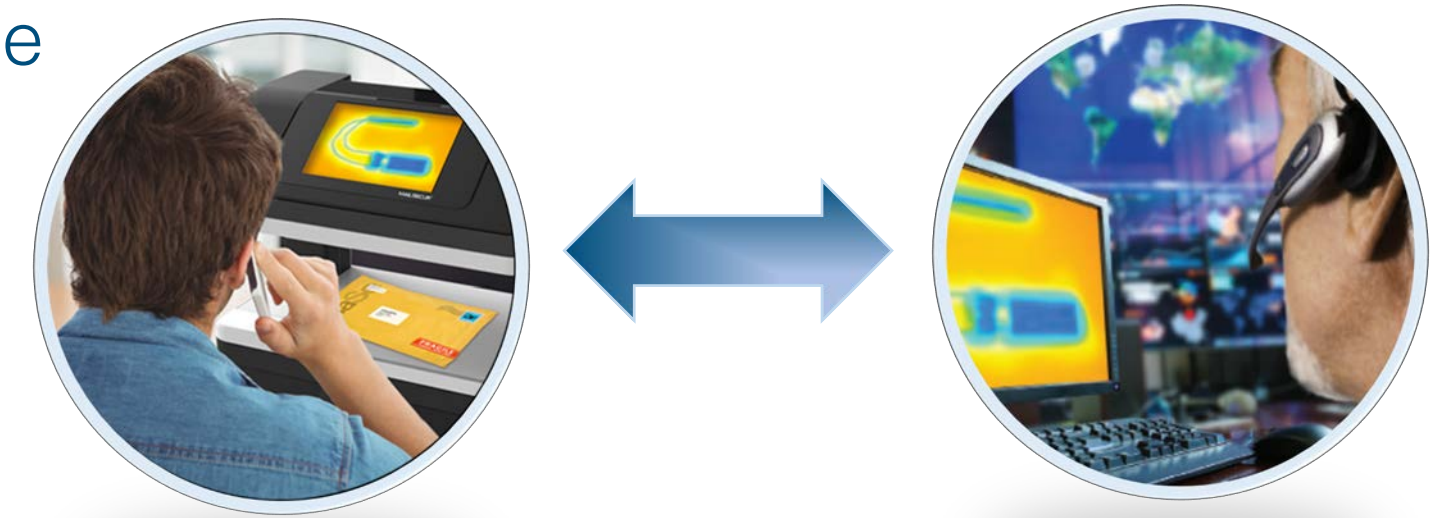


Conventional Threats

Liquids < 100 mg

Powders < 100 mg

Human Expertise



Preventing Threats BEFORE They Occur

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Revenge is the motivation that most often triggers a letter or package bomb, or a bomb threat.

U.S. Postal Inspection Service Report

- Most mail threats motivated by someone within or close to the organization
- Know your people, your customers, and anticipate changes in the business climate

Overt Mail Security

- Let employees know all mail is subject to screening
- Stamp security screened mail
- Discourage insider threats and reinforce security culture

https://about.usps.com/publications/pub166.pdf

Closing The Mail Security Gap

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1. Identify the problem.
2. Understand highest risk or most likely threats.
3. Implement a holistic solution spanning people, process & tech.
4. Use the right tools for the task.
5. Adhere to validated standards.

Additional Resources for Download

RAYSECUR™
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State of Mail Security – Annual Report

- ATF & USPIS data
- Case studies & analysis

RaySecur.com/Report

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