



“Water/Wastewater Operators, the Clean Water Professionals”

Security & Emergency Planning for
Water/Wastewater systems



“It has long been recognized that among public utilities, water supply facilities offer a particularly vulnerable point of attack to the foreign agent, due to the strategic position they occupy in keeping the wheels of industry turning and in preserving the health and morale of the American populace”

- J. Edgar Hoover, 1941



9-11 Changed Our World

The Big Picture – Many Threats

Somerset water contaminated

By JOHN WISLOCKI
Staff writer

Somerset Borough's 3,000 water customers probably won't know until Christmas Day whether the water they were officially advised not to drink or cook with Tuesday is harmful to their health.

Emergency preparations to provide the State Hospital, the Community Hospital, the with their safe have been made a tanker truck were made both hospitals empty containers reported old McNelly garage, South Franklin Avenue, Tuesday night.

Beginning Wednesday, water will be available from 8 a.m.-8 p.m. at the former McNelly garage for borough customers.

The temporary procedures came out of an emergency session of Somerset Borough Council convened because of the vandalism to the community's water supply, the one-million gallon reservoir at Hickory Hill.

The criminal mischief that occurred there several days ago was discovered early Tuesday afternoon by a General Telephone employee. A lineman had spotted the cover off of the largest of the three reservoirs for the Somerset area and notified borough officials.

At first, there was some fear that someone fell through the hole, but scuba divers Thomas Brown Jr. and Clay Morocco

found only garbage and no body in the zero degree weather.

A flashlight and two batteries, 10 tennis balls, two small empty containers of sealant, the remains of bar soap, and kernels of corn were hauled by bucket from the reservoir depth of 14 feet to Harold Hoggard, Somerset Borough Police Department criminal investigator. Hoggard told council what was recovered would be used for forensic purposes. Hoggard said the items were found in the reservoir. Hoggard said the items were found in the reservoir. Hoggard said the items were found in the reservoir.

"At this point in time everything points to random vandalism," he said.

The valve at the reservoir was turned off after the body of water was found contaminated. Water samples will be taken and tested before the reservoir is emptied into storm drains. The reservoir will then be sterilized, said Mahaney. The main reservoir at Hickory Hill is routinely refilled at the beginning of the week after the water level drops over the weekend.

Whether the other two reservoirs, each containing 500,000 gallons, will be emptied depends on what water samples reveal.

"Anyway you look at it it is a mess," Mahaney said.

Estimated cost to deal with the emergency was set at \$10,000. Taxpayers will be stuck with the bill, unless the vandals are apprehended.

Because of the fear of contamination, sales of bottled water increased at area stores.

One Kroger employee said the store's supply was depleted Tuesday, and the delivery of more bottled water would depend on when the next shipment arrives.

The next shipment at the Riverside Market, Somerset RD 2, arrives Thursday. That store's supply was sold out at about 6 p.m. Tuesday. The store was closed Tuesday. The store was closed Tuesday. The store was closed Tuesday.

Privately, borough officials said they have been drinking the water themselves without any signs of illness afterwards.

Acts of vandalism were committed in the area in the past.

The fence that surrounded one side of the reservoir was in disrepair and efforts to budget more funds to erect a new barrier have been proposed, but depend on council passing next year's budget on Tuesday.

The police intend to patrol the area more often, but drew the line at stationing officers there.

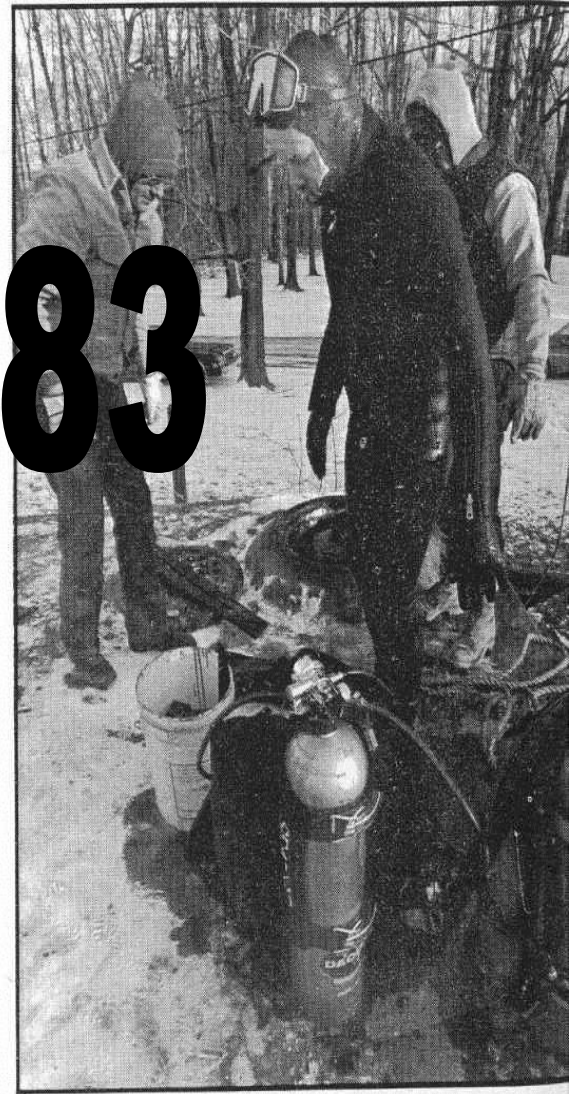
In other notes coming out of the emergency meeting: Reports of a hallucinogen, such as LSD, being placed in the water were discounted; the lock broken off the 50-pound metal reservoir lid has not been recovered; and "globs" of an unknown substance were felt in the reservoir, but couldn't be recovered by the divers.



(Staff photos by Keith Boyer)

Up from below

Somerset Borough Police Detective Harold Hoggard (above) inspects some of the items brought up from the borough's water reservoir Tuesday by scuba divers from the Somerset Volunteer Fire Department. One of the divers, Tom Brown Jr., right, emerges from the water after gathering several items in the cold water.





Security & Emergency Planning Concerns

- Natural Disasters
- Man Made Disasters

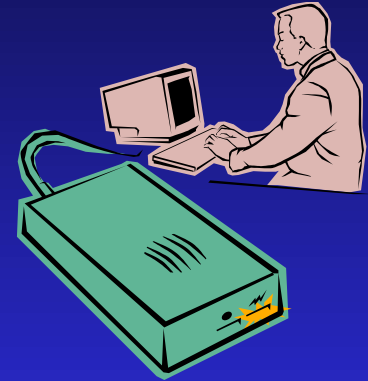




Internal Threats



External Threats





Events Will Happen

Effective Planning & Preparation

- Prevent or Minimize Loss of Life
- Prevent or Minimize Damage
- Will Provide a More Effective Response
- Minimize Downtime
- Speed Recovery
- Save Money

NIMS

The National Incident Management System



ICS

Incident Command System

NIMS

On February 28, 2003, President Bush issued Homeland Security Presidential Directive-5. HSPD-5 directed the Secretary of Homeland Security to develop and administer a National Incident Management System (NIMS). NIMS provides a consistent nationwide template to enable all government, private-sector, and nongovernmental organizations to work together during domestic incidents.

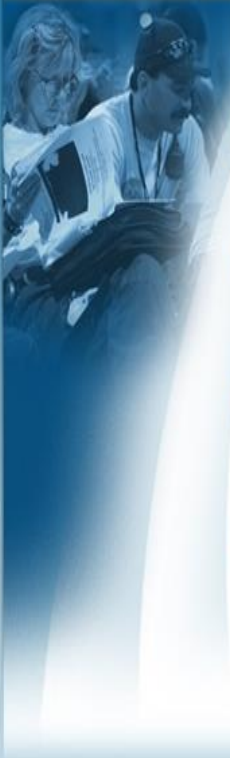
Tied to Federal Funding Beginning FY2006

Incident Command System

- **A standardized (all-hazard) incident management concept**
- **Split into 5 major Functions**



ICS Resource Center



Resource Center Contents

- **ICS Review Document**
A summary of key features and principles.
- **ICS Training Courses**
Access to related training materials and independent-study courses.
- **ICS Job Aids**
Printable job aids related to ICS positions and activities.
- **ICS Forms**
Printable versions of standard ICS forms.
- **ICS Position Checklists**
Printable checklists of ICS roles and responsibilities.
- **Glossary of Related Terms**
Alphabetical list of terms and acronyms, with definitions.
- **Reference Documents**
Printable versions of relevant reference documents.
- **Links**
A list of applicable resource documents and web sites.



Specific Threats

- Fire / Explosion
- Information Infrastructure
- Floods
- Tornado
- Other Severe Weather
- Vandalism
- Burglary
- Key Process Failure

- Disgruntled Customers
- Disgruntled Employees
- Civil Unrest
- Chemical Spills/Releases
– (From within or coming from the outside)
- Disrupted Utilities
- Critical Supply Shortages

Terrorist Activity
Terrorist Activity



Safety Concerns

- Confined Space
- Atmospheric Hazards
- Chemical Safety (lab & process)
- Electrical/Mechanical (Lock Out/Tag Out)
- Slips/Falls/Drowning
- Trenching & Shoring
- Lifting Injury/ Crush Injury
- Traffic
- Cuts & Bruises





Security / Terrorism

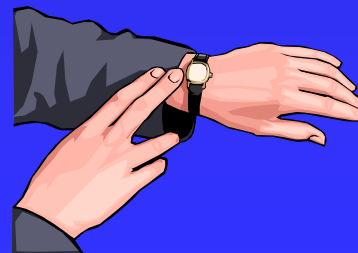
- Delay – (harden targets)
 - Detect
 - Respond
 - Recover
-



Security / Terrorism

Delay

- The amount of time needed for an adversary to overcome physical protection systems.
- Countermeasures that cause delay, may discourage a less sophisticated adversary.
- If we delay an adversary without detecting them, the length of the delay is meaningless.





Delay

Delay (simple measures)

- Keep Doors Locked
- Limit Access
- Locked Gates
- Lighting
- Patrols (neighborhood watch)





Delay

(Other counter measures)

- Fencing
- Hardened Locks
- Reinforced Windows
- Physical Barriers
- Physical Protection systems

Physical Protection Systems

- Access Control
- Intrusion Detection (interior & exterior)
- Delay Technologies





Security / Terrorism

Detection

- Ideally, we would like to detect an undesirable event as soon as it starts. We would like the moment of detection to be as close to the start of delay as possible.
- If the adversary completes their mission before we can respond, we have been defeated.





Detection

Alarm Control Systems

- Fire
- Intrusion
- Gas Detection (O₂, LEL, H₂S, Chlorine, etc..)
- Alarms for Key Processes (power failure, flooding, motor overload, High/Low pH, etc..)





Detection

- **Facility Staff**
- **Neighborhood Watch**
- **Police Patrols**
- **Water Quality Monitoring (automatic monitoring devices)**
- **Consumer Complaints**
- **Lighting (may deter as well)**
- **SCADA (Dialers)**
- **Detection Devices**
 - CCTV, infrared, ultrasonic, microwave, fiber optics, etc

Intrusion Detection Sensors

- Exterior or Interior
- Passive or Active
- Covert or Visible
- Line of Sight or Terrain Following
- Volumetric or Line Detection





Security / Terrorism

Response

- The response could involve multiple agencies (law enforcement, fire, EMS, etc,..)and must be coordinated.
- Good communications is a must for an effective response
- Preplan & Practice

ICS



Response

Responding to an incident

- Facility Personnel
- Outside Responders - Fire, Police, EMS, regulatory agency.
- Define Responsibilities for Responders
- Communications
- Unified Chain of Command



Security / Terrorism

Recovery

- The sooner we return conditions to normal, the better the public confidence in our ability to manage these events.
- Minimize or eliminate service disruptions
- Critique events



Recovery

Recovery – Normal Operations

- Spare parts
 - Manufacturers/Vendors/Contractors
 - Contingency Funds
 - Critique
-



What Can We Do? Where Should We Start?

- Additional Training (FEMA)
- Work with local emergency responders, give tours, receive input.
- Mission Statement
- Vulnerability Assessment
- Develop Plans / Strategies
- Put Into Action
- Train / Test/ Revise



VA

1. Planning
2. Threat Assessment
3. Facility Characterization
4. System Effectiveness
5. Security Implementation Plan
6. Re-evaluate



A VA generally should address six basic elements

1. Characterization of the water /wastewater system, including its mission and objectives;
2. Identification and prioritization of adverse consequences to avoid;
3. Determination of critical assets that may be subject to malevolent acts that could result in undesired consequences;
4. Assessment of the likelihood of such malevolent acts from adversaries (e.g., terrorists, vandals);
5. Evaluation of existing countermeasures; and
6. Analysis of current risk and development of a prioritized plan for risk



Conducting a Vulnerability Assessment (VA)

→ Step 1 = PLANNING

- Establish a team
- Develop a mission statement with prioritized objectives
- Identify & prioritize critical assets
- Identify threats or potential threats (evaluate likelihood)
- Review existing physical protection systems (effectiveness)





Conducting a VA

Establish a team...

- Treatment Plant Operators
- Facility Engineers
- Key Customers
- Budget Analyst
- Security Professional
- Municipal Manager
- Elected Officials
- Emergency Response Officials
(Fire, Police, EMS)
- Regulatory Staff ???



Mission Statement ??

Mission Statement ??

- Water Quantity (adequate volume & pressure under normal conditions)
- Water Quality (meets all regulations)
- Affordable Product (no rate increases)
- Aesthetically Pleasing (no color, taste or odor)
- Public Safety (fire protection, high flow conditions)



Prioritize



Mission Statement ??

Mission Statement ??

“ The Backwoods Water Company exists to provide abundant, safe, clean and palatable water to its customers on demand at an affordable price. BWC will strive for excellence and will protect both human and environmental health in the community we serve.”

Water quality?

Price?

Water Quantity ?

Fire Protection?

Using Pair Wise

- You will be purchasing a new Corvette, you will have to rank the importance of the following criteria.
 - ◆ Exterior Finish
 - ◆ Interior Finish
 - ◆ Price
 - ◆ Engine/Trans
 - ◆ Fuel Economy

Pair-Wise - Corvette



1 = **Much Lower** than above 2 = **Lower** than above 3 = **Same** as above
4 = **Greater** than the above 5 = **Much Greater** than the above



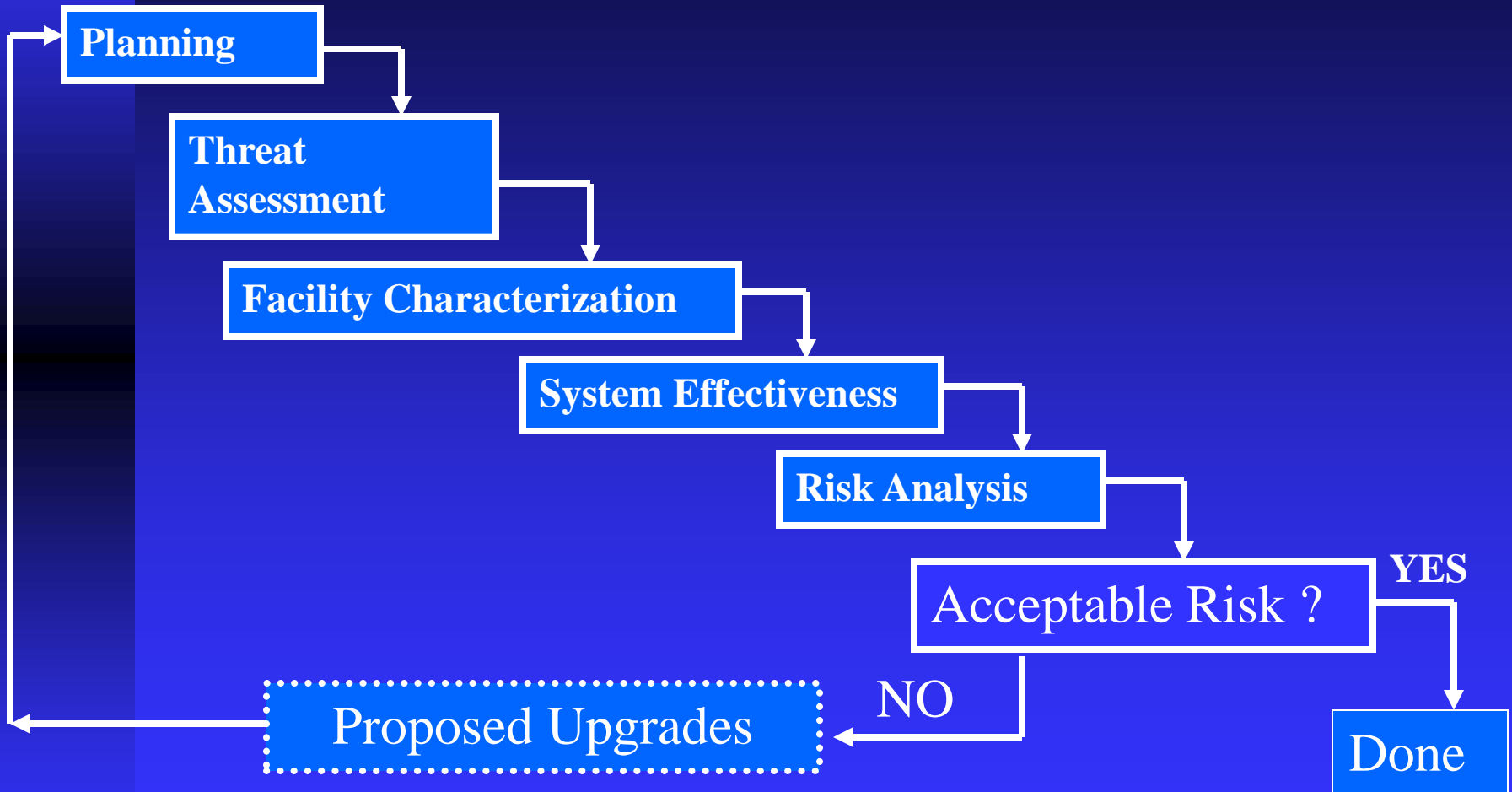
Total will add up
to 6 for each

Exterior Color /Finish
Interior Finish
Price
Engine/Trans
Fuel Economy

SUM

	Exterior Color /Finish	Interior Finish	Price	Engine/Trans	Fuel Economy	SUM
Exterior Color /Finish						
Interior Finish						
Price						
Engine/Trans						
Fuel Economy						

Risk Assessment Methodology



VA Tools

← Back → → × ↻ 🏠 🔍 Search 📁 Favorites 🌐 Media 🌍 📄 📄 📄 🗨

Address  http://www.vsatusers.net/

The Vulnerability Self Assessment Tool™ for Water & Wastewater Utilities

[Home](#)

[About VSAT™](#)

[Overview](#)

[Web Brochure](#)

[What's New](#)

[Order Software](#)

[Register Software](#)

[Training](#)

[F.A.Q.](#)

[Coming Soon](#)

[Publications/Links](#)

[User Support/Contact Us](#)



VA Tools



Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems **Serving Populations Between 3,300 and 10,000**

Also available at:
www.vulnerabilityassessment.org

National Rural Water Association
November 13, 2002



Asset Based Vulnerability Assessment

- Physical Assets
- IT Assets (billing systems, electronic records)
- Employees
- Knowledge Base
- Customers



Counter Measures that reduce Criticality

- Redundant Systems
- Physical Interconnections
- Adequate Spare Parts
- Multiple Channels of Communication
- Duplicate Documents
- Back-Up Files
- Storage (water or WW)
- Emergency Contracts



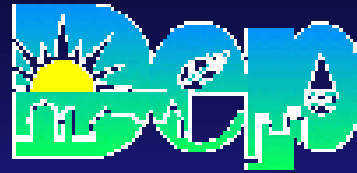
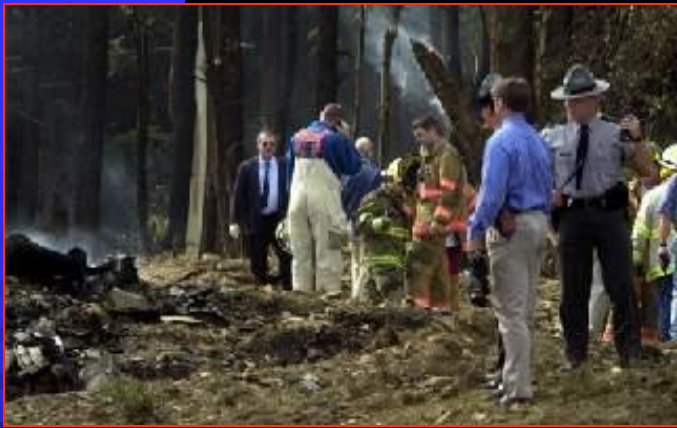
Emergency Response Plans

- **ERP** – Covers natural disasters and equipment failure
- **Security Plan** – Addresses people incidents
 - Pre-Incident
 - During Incident
 - What to Do
 - Who to Call
 - When to Call
 - Post-Incident

Emergency Operations Plans Security Planning Facility Safety Programs

- Train
 - Test / Drill
 - Revise
-

→ **Otherwise, it will be worthless** ←



CRIME SCENE (101) for Utilities

Preservation of Evidence
&

Public Protection





When there is a Criminal Act.

- Notify Law Enforcement.. and DEP
Immediately Secure the area, keep people away.
- Photograph Everything
- Document Everything
- Chain of Custody (samples)



Securing the Area

- Notify Law Enforcement
- Rope off/ Tape off the area, Keep people out (especially your own employee's), do not touch or handle anything. If someone already has handled something make detailed notes as to who what when and where. Beware of Secondary devices...
- Implement ICS (unified chain of command)
- Allow law Enforcement to do their job.



Photographs

- Without touching or disturbing anything or entering the immediate crime scene, take photographs of everything, including people standing around. Document all of your photos (35 MM works best), label prints when they get developed. Who took the photo, when, where describe scene.
- Have set of “normal photos”, taken of key facilities prior to an event



Documentation

■ Document **EVERYTHING** (ASAP)

- ◆ Who found it? Or who called in the incident?
Exactly what did caller state?
- ◆ What time? What/Who was seen?
- ◆ Weather Conditions at the time.
- ◆ When were things last seen to be normal?
- ◆ Who had access & when?
- ◆ Log of all photos and samples
- ◆ No details too small

- ◆ *Years could pass before a court date.....*



Chain of Custody

- Be sure to have a “Chain of Custody” paper trail for all samples collected.
- DEP or law Enforcement can assist you with this function



Available Resources

- Local – Existing Workforce & ER Agencies
 - State – DEP, PEMA, other Agencies
 - Federal – EPA, FEMA, Others
-



Likely Threats

(History of Events in PA)

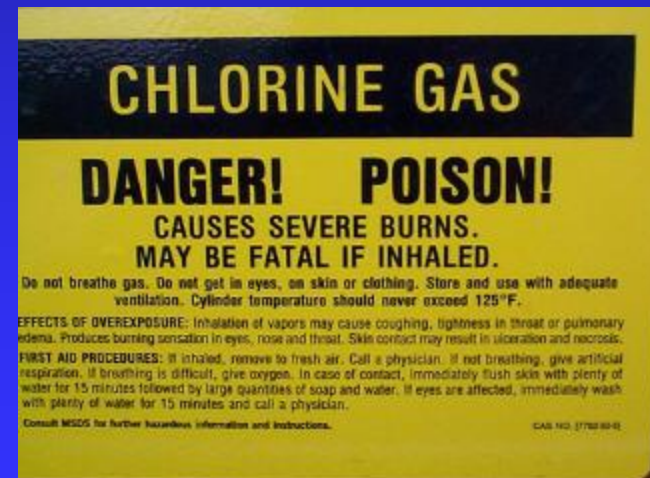
- Floods
- Digester Explosions
- Chemical Releases (Chlorine)
 - Internal & External (spills originating in collection system)
- Burglary
- Vandalism
- Employee Sabotage
- Confined Space Accidents
- Loss of Normal Power
- Cross Connections/Backflow



Other Laws

(that impact security & emergency planning)

- CAA Section 112 (r) - risk management
- SARA Title III
- PA Act 165





By: Thomas J. Brown

- Pennsylvania DEP Cambria Office
286 Industrial Park Road
Ebensburg, PA 15931-4119
(814) 472-1900 (voice)
(814) 472-1861 (fax)
thbrown@pa.gov

