What We’ll Cover

- My background
- A history of utility security
- What is the process for completing a risk / vulnerability assessment?
- What does this tell you about a utility?
- Why is this important?
- Oh, and now it’s the law
- Some typical vulnerabilities
- Story Time
- Summary
My Background

- Civil engineer w/ 35+ years experience
- PENC Community Leadership Steering Committee, Floyd Disaster Response - PENC President’s Award
- Original NC AWWA-WEA Disaster Preparedness, now Risk Management committee
- Joint ASCE / AWWA / WEF Water Infrastructure Security Enhancements guidance committee
- GAO water security funding priority study
- AWWA G430 standard committee
- AWWA M-19 committee
- Original AWWA J100-10 standard committee
- Chair AWWA J100-10 standard update committee
- Led more than forty VA’s / RA’s

Utility Security History

- Pre 9/11 “Security”
  - Primarily natural disasters
  - “Security” concerns dominated by accident and hurricanes/natural events
  - Emergency response focused on natural and accidental events
  - Intentional acts largely considered unconnected and unreported

PENC Disaster Response after hurricane Floyd
Utility Security History

- Immediately post 9/11 - Terrorism
  - Vulnerability assessments using RAM-W™ and early versions of VSAT™
  - Focus on threat and prevention; terrorist attack on a utility, physical security
  - Only 6-months to “complete” an Emergency Response Plan sets the tone. Focused on terrorism.
  - All hazards approach, consequence mitigation not stressed
  - No real risk and resilience assessment and management

Utility Security History

- Current Time (Prior to 10/23/18) - All Hazards
  - AWWA J100 standard is adopted (2010).
  - Some utilities began focusing on a holistic or all hazards approach, but not many.
  - Many utilities still did not see the importance of utility risk and resilience management.
    - Not a Terrorist Target
    - Many More Priorities
    - Not required
  - J100 reinforced the all hazards approach at the national level.
  - Use of dollar value of risk in decision making.
  - See the following all hazards examples….
Utility Security History

Present Day Condition Based Failure

1998 NE & Canada Ice Storm

2018 Hurricane Florence

2011 Alabama Tornadoes

Utility Security History

2018 California Wildfires

2011 Virginia Earthquake

2010 NE Blizzards

2003 NE Blackout
History in the Water Sector

- **RAM-W™**
  - Sandia Lab Risk Assessment Methodology for Water Utilities (pre-9/11)
- **VSAT™**
  - Vulnerability Self Assessment Tool (post 9/11)
- **SEMS**
  - Security and Emergency Management Software (post 9/11)
- **AWWA J100-10, 13**
- **VSAT™ and PARRE**
  - Latest software tools considered J100 "compliant"
  - These cover both water and wastewater, i.e. the water sector

What is the Process for a VA?

- **RAM-W™ process**
  - Planning
    - Prioritize facilities
  - Threat Assessment
    - Design basis threat, likelihood = 1.0
  - Facility Characterization
    - Prioritize facilities and assets
  - System Effectiveness
    - Existing physical & operational countermeasures
  - Risk Analysis
  - Risk Acceptable? (Risk Management)
    - Proposed countermeasures
What is the Process for a RA?

J100 seven step process
- 1. Asset Characterization
- 2. Threat Characterization
- 3. Consequence Analysis
- 4. Vulnerability Analysis
- 5. Threat Likelihood Analysis
- 6. Risk/Resilience Analysis
- 7. Risk/Resilience Management

What Does This Tell You?
- What are your most critical assets?
- What are your relevant threats?
- Where/what are your vulnerabilities?
- What is the dollar value of risk you’re facing?
- What is your level or resilience?
- Develops a prioritized plan for improvement
  - All with a defensible and transparent methodology.
- See the sample risk matrix
Why is This Important?

- There are standards (AWWA G430, J100, G440, M-19, etc.), best practices, standard of care
- There is a level of liability involved
- Risk = $’s
- Like asset management, this represents good utility operation and management
- Why is J100 important?
  - Support Anti-terrorism by Fostering Effective Technologies Act of 2002 (SAFETY Act)
  - Industry standard
  - Risk calculated in dollars
  - All hazards
  - Risk and resilience together

Oh, And Now It’s The Law

- PL 115-270 - America’s Water Infrastructure Act of 2018 (AWIA)
  - Requires Risk and Resilience Assessments for all water systems serving >3,300 population
  - Consider malevolent and natural threats
  - Physical, financial, cyber
  - Large utilities (serving >100,000 population) complete by 3/31/2020
  - Emergency Response Plans (ERPs) complete six months afterwards
  - Must certify compliance in writing to the EPA, but not submit the assessment.
  - EPA recognizes voluntary, consensus based standards and AWWA J100 is the only one.
  - AWWA certification program under development.
## Some Typical Areas of Vulnerability

- Not completing and learning from a true Risk Assessment.
- Not understanding good physical security, i.e. detection, delay and response.
- Lack of awareness of the real risks faced and their dollar cost to the utility, i.e. focusing on the wrong things.
- Not having a strong relationship with LLE, FD, NCEM, FBI, etc.
- Not documenting and applying all Lessons Learned.
- Insiders

## Some Typical Areas of Vulnerability (cont.)

- Not knowing what/where are your most critical assets
- Having a general lack of security awareness
- Not having true redundancy in your critical systems
- Having inadequate policies, procedures, and training
  - Emergency response plan
  - Business continuity plan
  - Table top exercises
- Unprotected single points of failure, especially electrical, SCADA and other cyber systems
- Others?
Story Time

What caused the DC WASA (now DC Water) fumes?

What goes on in their tunnels?

The Washington Post

Fumes Force Evacuation of Treasury Building

The Treasury building was evacuated just before 3 p.m. yesterday after several employees complained of fumes coming from the basement level, according to a D.C. fire department spokesman. No one was injured, but evening rush-hour traffic in the area was at a standstill after D.C. police closed 15th Street between New York and Pennsylvania avenues NW and the nearby blocks of F and G streets.

At 6 p.m., those blocks were still closed.

About the same time the Treasury building was evacuated, similar odors were detected at the D.C. Water and Sewer Authority’s O Street SE pumping station, where about 15 people were evacuated, and also in an office building in the 800 block of Vermont Avenue NW, according to fire department officials.

Later, it had not been determined if the incidents were related.

However, the Treasury building incident is under investigation by the city’s health department, the environmental crimes unit of the police department and the criminal branch of the Environmental Protection Agency.

Officials tested water samples from manholes throughout the system and suspect that the substance could be coming from illegal dumping into the sewer system by a hazardous materials carrier, said Theodore Gordon, chief operating officer for the D.C. Health Department.

The problem was traced to the old sewer system in the Treasury building basement, but the cause of the odor is an unknown, volatile organic substance, Gordon said. There is a slight chance of combustibility, but the main concern was the building’s air quality, he said.

About a half-dozen people reported eye irritation, headache and nausea, fire department spokesman Alan Etter said.

Story Time

Security in paradise (Hawaii), someone had to do it....

Conversation between the FBI and the County Sheriff.

Two things happen when you dial 911.

White hard hat and a clipboard, and...

...the young man who said “Stop!”

Where were you on Tuesday September 11, 2001?
## In Summary

- Think all hazards, not just terrorism anymore
  - Natural, Intentional, Proximity, Dependency
- There are standards, industry best practices, standards of care
  - There could be liability involved.
  - Be aware, the standard is being updated right now.
- No longer using vulnerability assessment, now risk assessment
- We all face risk at our facilities, but do you understand it?
- The original methodology is adaptable to all infrastructure sectors
  - Risk = $$'s
  - It’s now the law!

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