



Utility Security: *How Much is Enough?*

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Utility Security

- ◆ Not just about the latest electronic gadgets
- ◆ Not about creating an impenetrable fortress
- ◆ Not just about Terrorism
- ◆ Apply Risk-Management Perspective to Security Systems & Procedures to minimize your liability
- ◆ Start with a Vulnerability Assessment (VA)



Utility Security: VA

- ◆ Begin by Identifying Threats
 - Terrorism
 - Vandalism
 - Contamination
 - Severe Weather Events
 - Other Disruptions



Utility Security: VA cont.

- ◆ Threats can be carried out by:
 - Terrorists
 - Other Criminal Agents
 - Extremist Groups
 - Insiders
 - Nature



Utility Security: VA - The First Step

◆ Asset Identification

– Facilities

- WTPs
- Pump stations
- Well houses
- Reservoirs
- Transmission/Distribution mains
- Supply yards
- Etc.



Utility Security: VA-The First Step cont.

◆ Asset Identification Cont.

- People (Staff)
- Knowledge Base (as-builts, records)
- Information Technology (SCADA/Controls)
- Customers



Utility Security: VA - The Second Step

- ◆ Determine the Levels of Risk Present
 - Vulnerability
 - Criticality
 - Probability



Utility Security: VA - Levels of Risk

◆ Determine Vulnerability

- How safe/exposed is an asset?
- Is facility in remote area or urban setting?
- Are countermeasures already in place?
- Is site easily accessible to traffic?



Utility Security: VA - Levels of Risk cont.

- ◆ Determine Criticality (Consequences)
 - How critical is the asset to your operation?
 - Can your system operate reliably w/o the asset?



Utility Security: VA - Levels of Risk

◆ Determine Probability

- What is the likelihood of an event occurring to an asset?
- How likely is it that your asset will be impacted?



Utility Security: VA - Third Step

◆ Quantify Levels of Risk:

$$\text{Risk} = V \times C \times P$$

where: V = Vulnerability

 C = Criticality

 P = Probability

Example: $0.9 \times 0.1 \times 0.1 = 0.009$



Utility Security: VA - Fourth Step

◆ Determine Risk Acceptability

- From Risk Levels calculated, decide what level is acceptable



Utility Security: VA Summary

- ◆ VA's can be approached in many ways
 - Self performed
 - Performed by qualified design engineers
 - Performed by experienced security firms
- ◆ Consider a look by an outsider
 - Police
 - Fire
 - Other third party



Utility Security: Enhancements

- ◆ Enhancements should address the following questions: “What do we need to do to be **prepared** for human and natural extreme events?”
- ◆ How do we **Deter** potential threats?
- ◆ How do we **Detect** potential threats?



Utility Security: Enhancement Checklist

◆ Asset I – Facilities

- ✓ Perimeter
- ✓ Entry/Access Control
- ✓ Surveillance
- ✓ Vehicle & Materials Delivery Management
- ✓ Distribution/Collection Systems
- ✓ Hazardous Materials Control



Utility Security: Checklist Items

◆ Asset II – People

- ✓ Human Resources Policies
 - ✓ Hiring Practices
 - ✓ Plan to address staffing for employees called to active duty
- ✓ Personnel Identification & Personal Welfare
 - ✓ Badges
 - ✓ Visitor logs
- ✓ Planning & Training
 - ✓ SOPs
 - ✓ First Aid



Utility Security: Checklist Items

◆ Asset III – Knowledge Base

✓ Planning

- ✓ Emergency Response

- ✓ Contacts with local law enforcement agencies

✓ Critical Business Documents

- ✓ “As-built” drawings

- ✓ Phone number lists



Utility Security: Checklist Items

◆ Asset IV – Information Technology

✓ Policies & Planning

- ✓ Internet Access

✓ Protection

- ✓ LAN/WAN

- ✓ Backup Power

✓ SCADA

- ✓ Redundancy



Utility Security: Checklist Items

◆ Asset V – Customers

✓ Communications

- ✓ Boilerplate draft press releases
- ✓ Spokesperson as point-of-contact

✓ Finance

- ✓ Availability of Contingency budget line items
- ✓ Access to funds and investment records



Utility Security:

- ◆ Planning and Preparation are very important
- ◆ Ability to Deter & Detect are key
- ◆ However, given no sure way to stop or avoid an event
 - **Response is vital**



Utility Security: Response

- ◆ Treat all threats seriously; Don't panic
- ◆ Notify law enforcement officials, utility officials, regulators, etc.
- ◆ Increase water quality monitoring
- ◆ Assess magnitude of threat
- ◆ Involve media via a spokesperson
- ◆ Initiate alternative service providers



Utility Security: Design Considerations

◆ Objectives

- Public Health (Acute & Chronic)
- Regulatory Compliance
- Fire Protection
- Protection of Water System Assets
- Convenience

◆ Protection of Facilities

- Redundancy
- Separation
- Protection



Utility Security: Design cont.

- ◆ Alternate raw water sources
- ◆ Parallel treatment units
- ◆ Interconnects
- ◆ Alternate sources of power
- ◆ Manual control capabilities
- ◆ Fencing
- ◆ Vehicle Access
- ◆ Site Lighting



Utility Security: Design cont.

- ◆ SCADA firewalls
- ◆ Physical barriers
- ◆ On-line monitoring equipment
- ◆ Remote control



Utility Security: Construction Considerations

- ◆ Background checks of Contractor Employees
- ◆ Site access
 - Fencing
 - I.D. Badges
- ◆ Inventory Control
- ◆ Excavation Monitoring
- ◆ Document Control (bid specs, etc.)



Utility Security: Additional Information

- ◆ EPA Safe Drinking Water – www.epa.gov/safewater
- ◆ AWWA – www.awwa.org
- ◆ AMWA – www.amwa.net
- ◆ Sandia National Labs – www.sandia.gov
- ◆ CDC – www.bt.cdc.gov
- ◆ AMSA – www.amsa-cleanwater.org