

**CH2MHILL®**

# iSCADA Make SCADA Fit Your Operation Needs



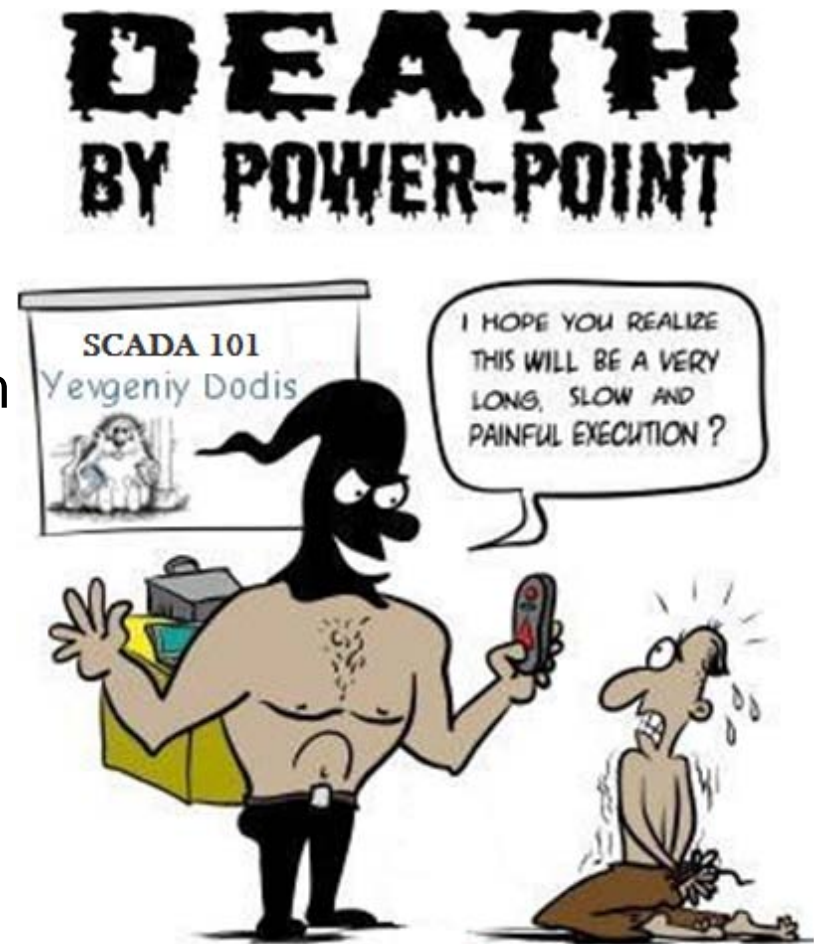
*Michael Karl*

*CH2M HILL*

*mkarl@ch2m.com - May 2012*

# AGENDA

- SCADA's mission
- When, Why and How to upgrade
- SCADA in the distribution system
- What's new in SCADA



# SCADA supports your mission



**Reliable**



**Meets standards**



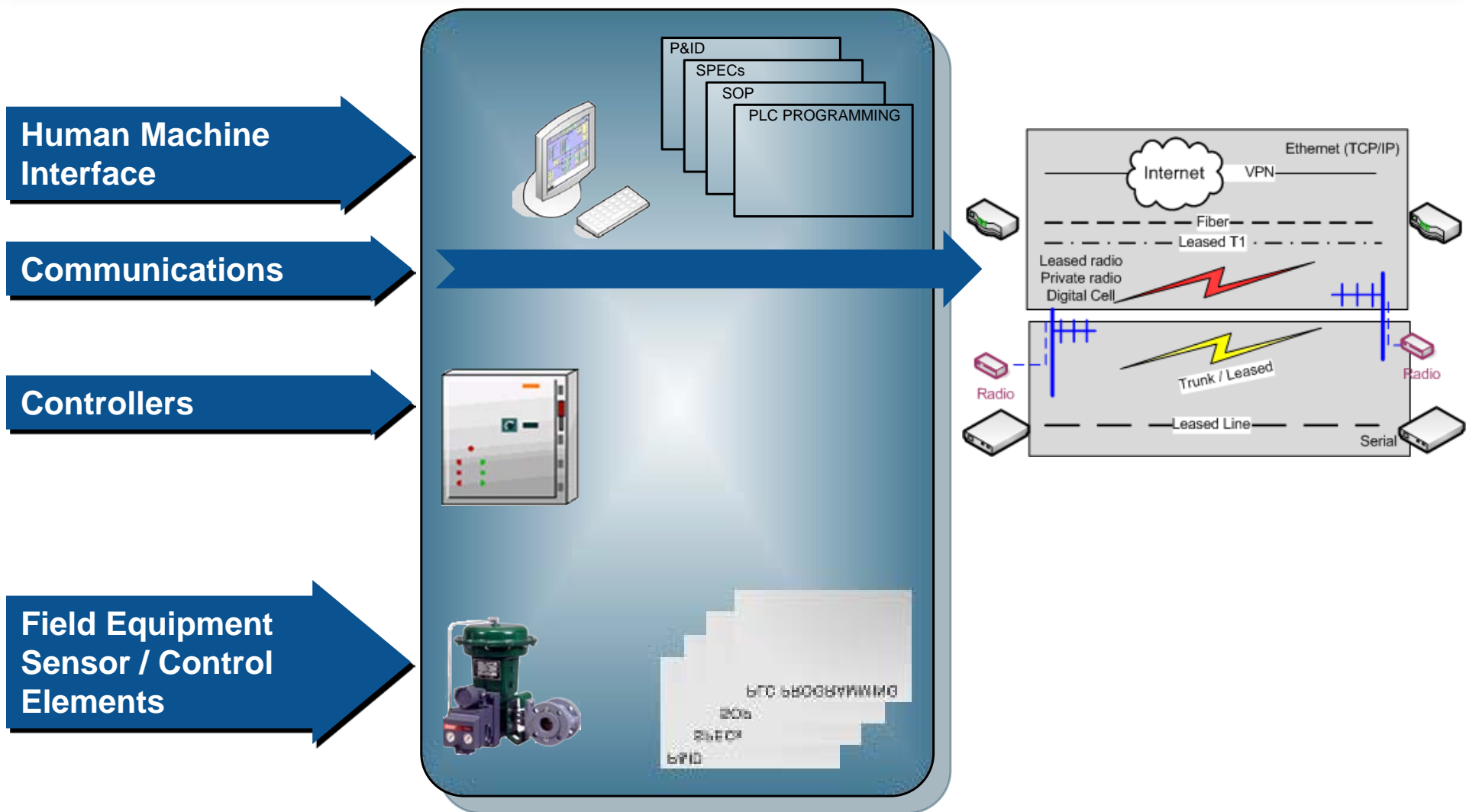
**Affordable**



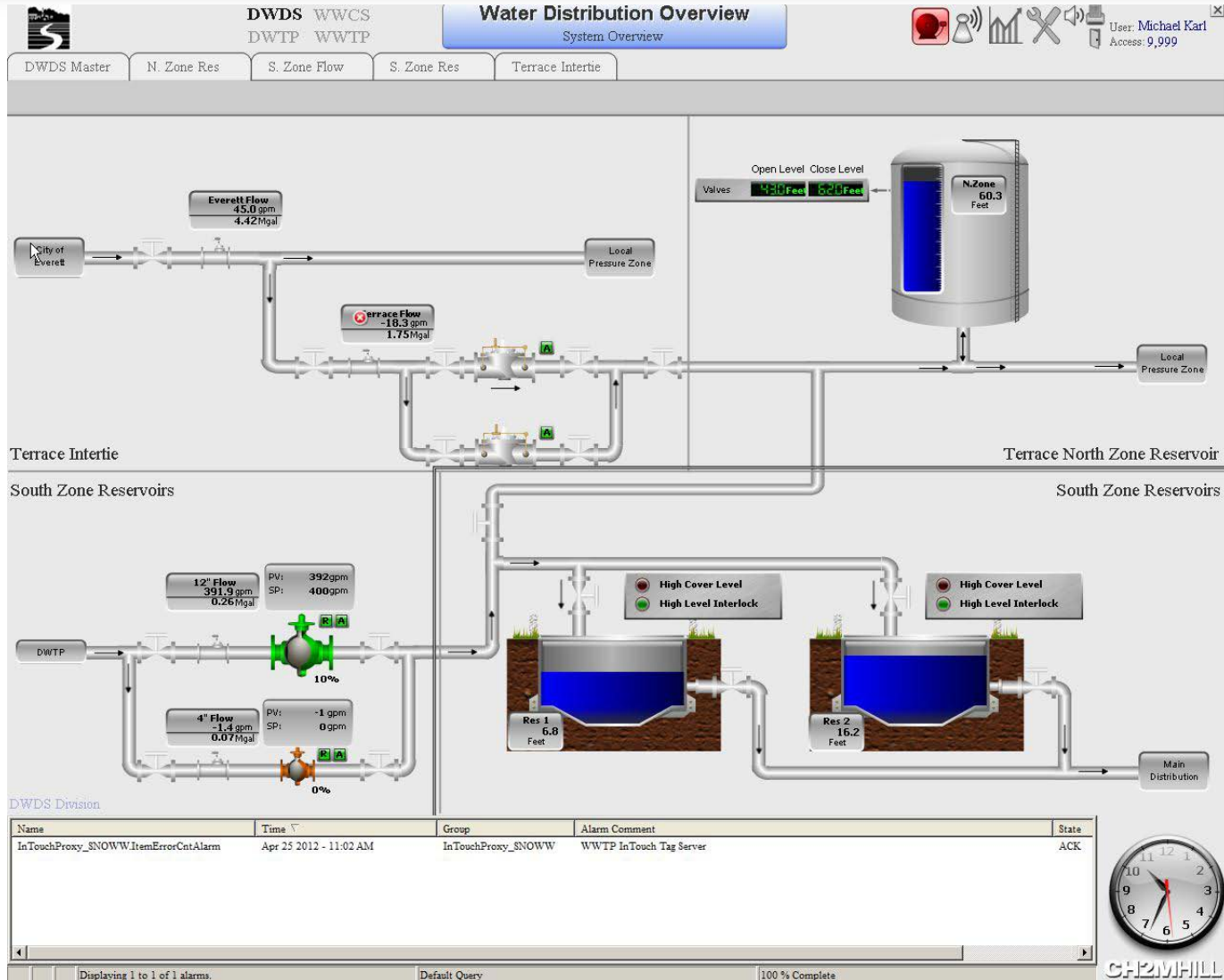
**Safe and Sustainable**

**The mission:** To provide the safest and most reliable services to our customers, while maintaining policies and practices that protect the environment, and promote the health and welfare of the community at a fair and equitable cost.

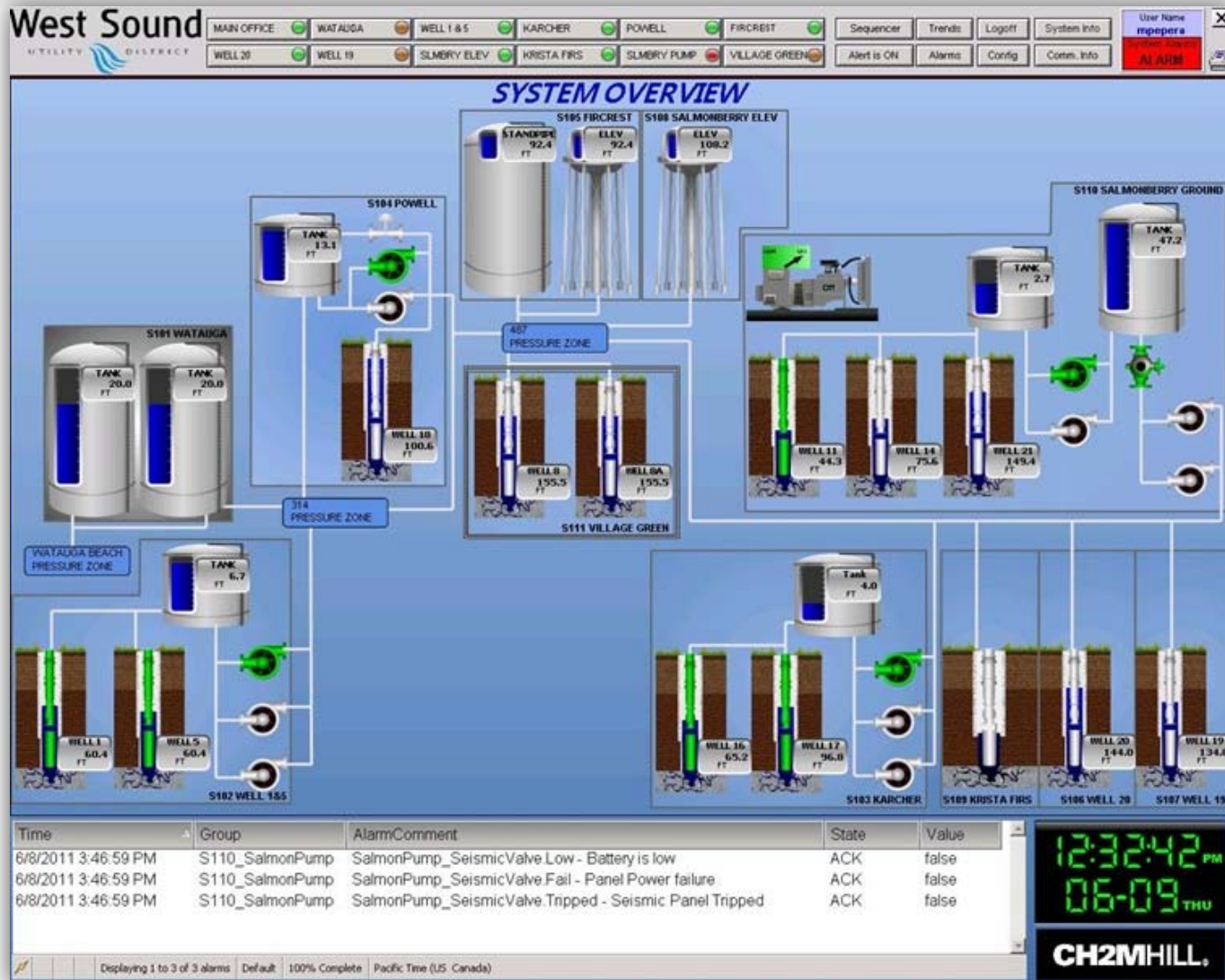
# SCADA automates the monitoring and control of water systems



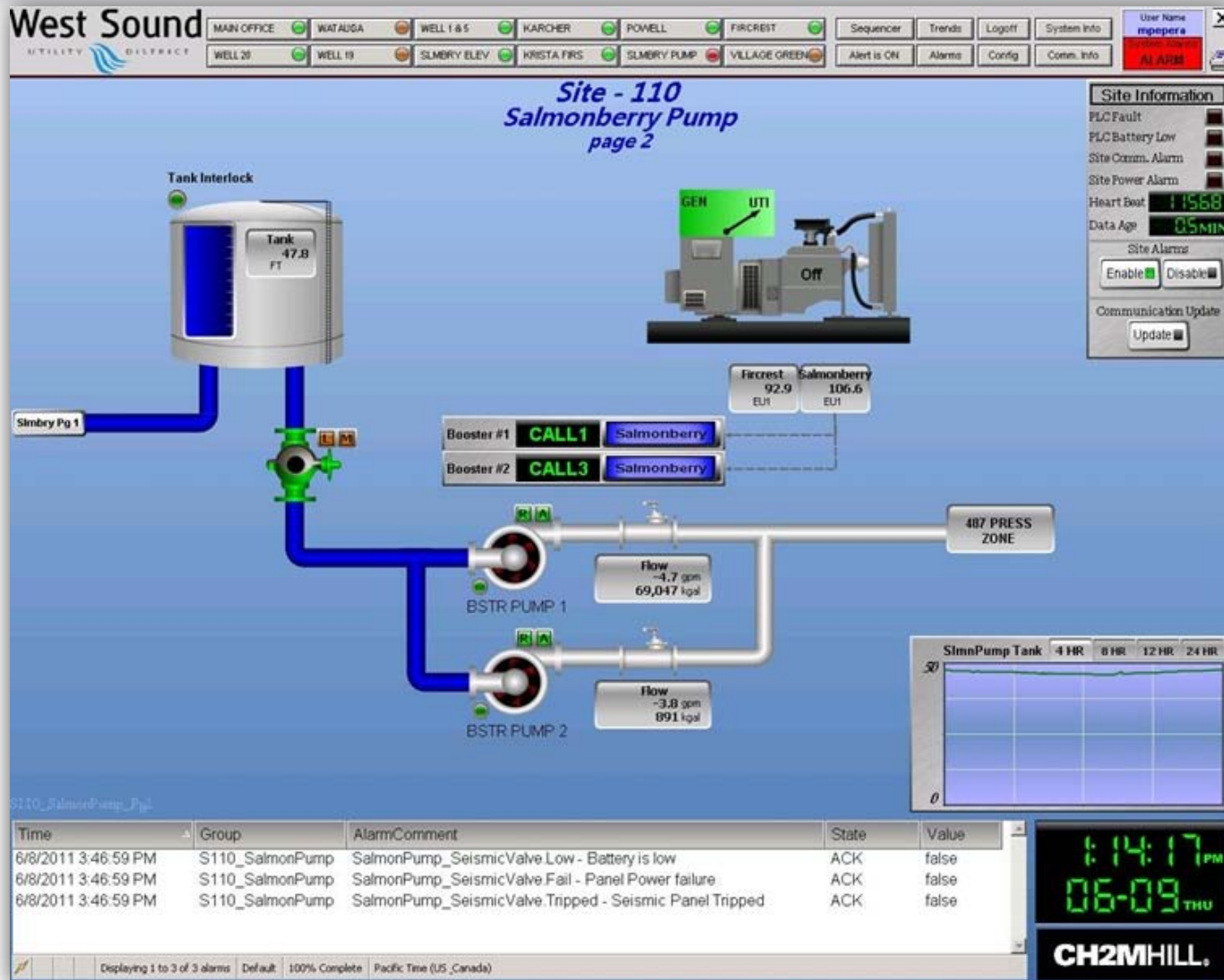
# Sample HMI graphics



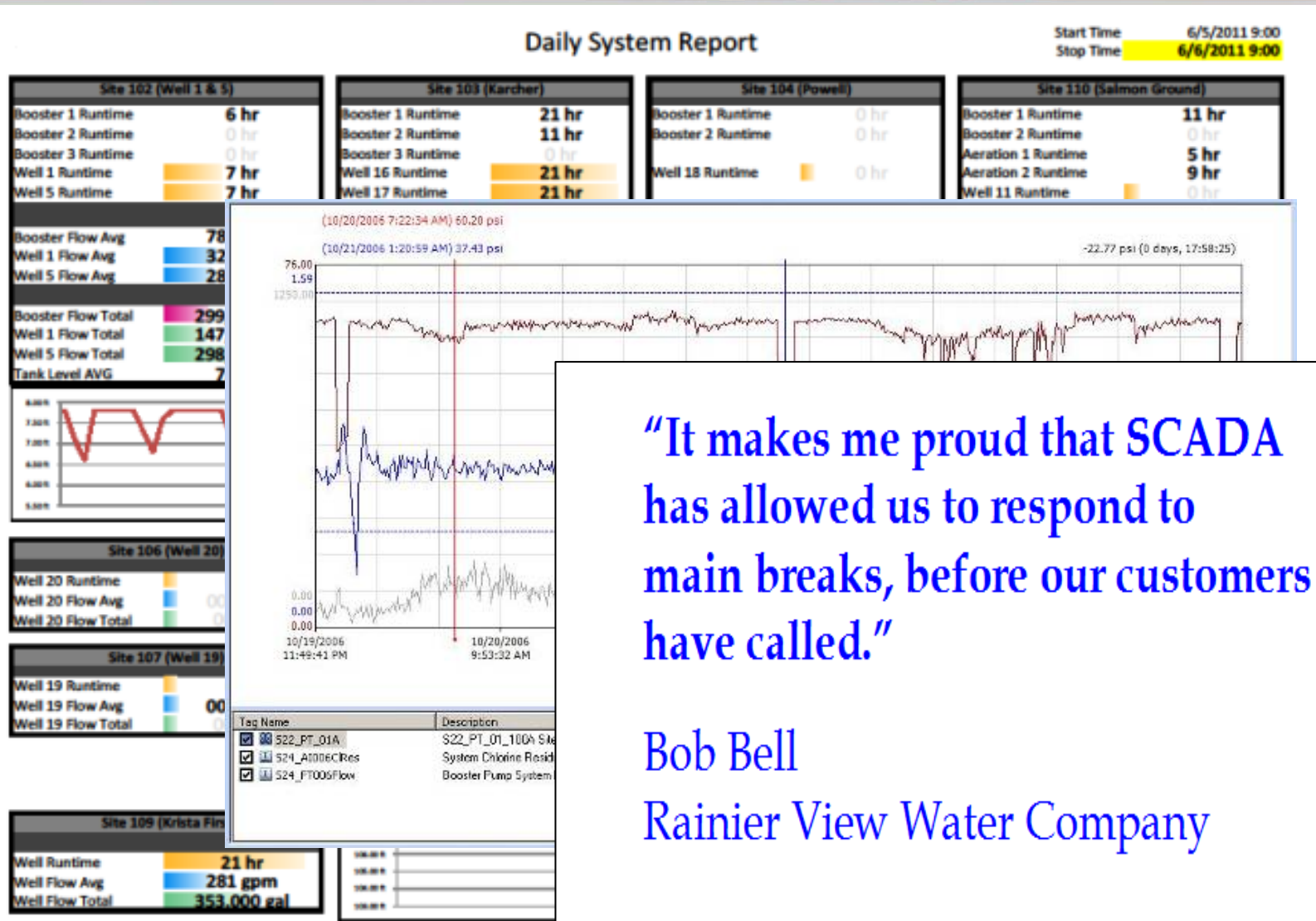
# Sample HMI graphics



# Sample HMI graphics



# SCADA converts “geek-speak” to “operator-speak”



“It makes me proud that SCADA has allowed us to respond to main breaks, before our customers have called.”

Bob Bell  
Rainier View Water Company



# What does SCADA do for You?

- Monitor and control treatment process
- Remote monitoring
- Increased safety
- Lower costs
- Automated reporting
- Lower cost training and spare parts
- Fewer callouts
- Frees staff for more productive activities

**“After upgrading our SCADA system, not only did our costs decrease but *our operators say their quality of life has improved*”**

Michael Whitehead  
West Sound Utility District

***WHEN, WHY AND HOW*** TO UPGRADE  
YOUR SCADA SYSTEM

# Why upgrade?

- Equipment obsolescence
  - Lack of support in failure
  - No redundancy
- Lack of documentation
- Reduce risk of permit violations, system excursions
  - As equipment ages, failure rate is not linear
  - First 10 years = 1 fail per year, then an increase
  - Failures can be expensive!
- Improve operational efficiency and quality
  - Water quality
  - Water loss
  - Energy management

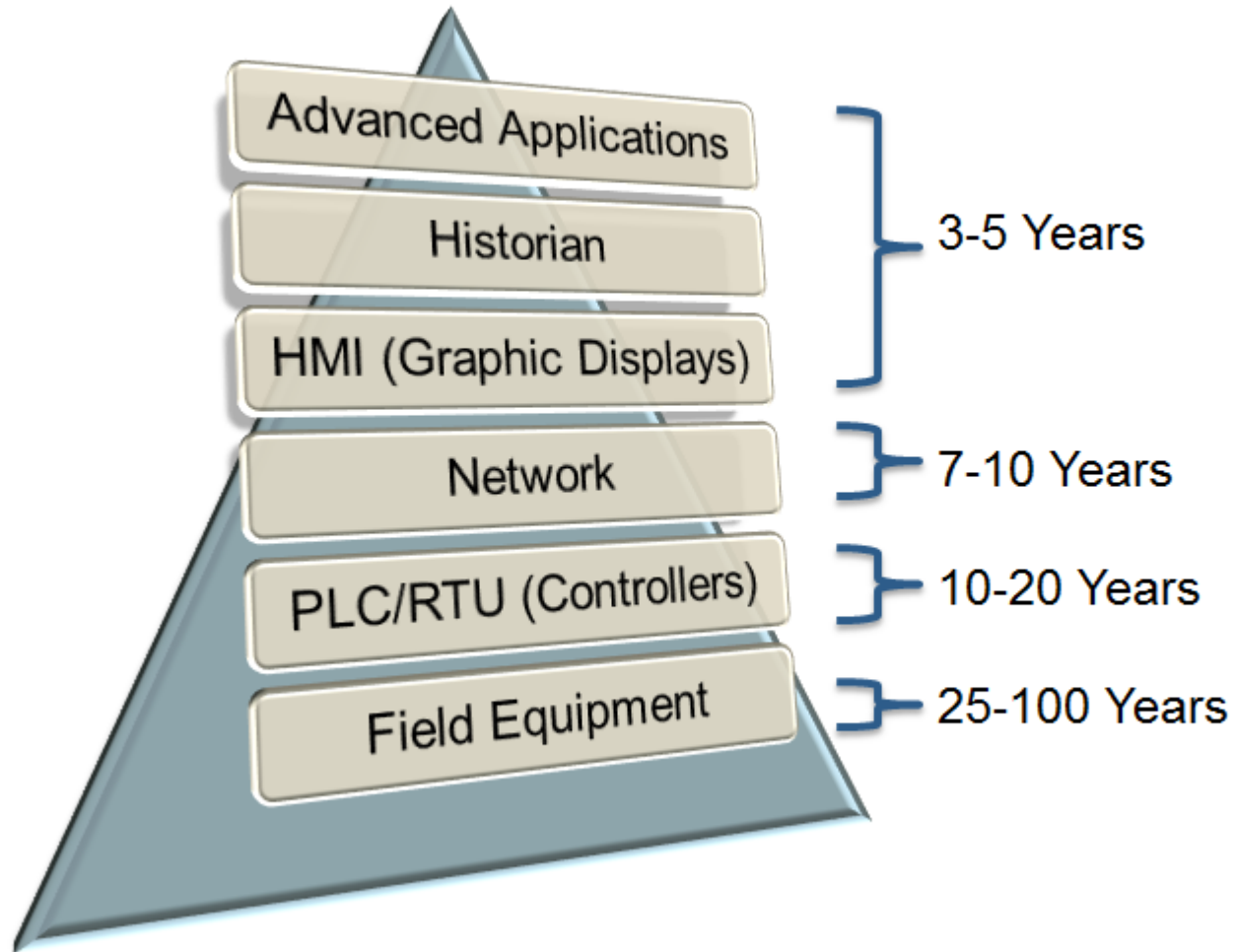
How many people have  
main replacement  
programs?

SCADA Alarm 6.0

\$



# Average lifespan of automation equipment



# Tank overflows are a common system failure

## Overflowing Tank Floods PSU Bookstore

Damage Estimated At \$1 Million

POSTED: 3:46 pm PST February 8, 2010

UPDATED: 6:24 pm PST February 8, 2010

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[» Print](#)

**PORTLAND, Ore.** -- An overflowing tank dumped thousands of [gallons](#) of water into the Portland State Bookstore basement Sunday night, causing \$1 million in damage.

On Monday, bookstore workers cleaned up the soggy mess that was caused by a sensor malfunction in the [storage](#) tank that holds water for fire suppression.

Ken Brown, who runs the Portland State Bookstore, said the sensors indicated there was little water in the tank when, in fact, it was filled with 40,000 gallons.



***\$1,000,000 in damage due to a \$1,000 level sensor failure***

# Blue Screen of Death

## Problem – Lack of Attention

- 3:20 PM on December 23<sup>rd</sup>
- Loss of Automation
  - Alarm monitoring
  - Alarm Notification
  - Historical Information



## ■ Lessons Learned

- Make Virtual Image Backups
- Test your Backups
- Ensure you have working manual backup

# I know I need to Upgrade...

- Get in-house or outside integrator support
  - Do a system walk-through
  - Identify what needs to be upgraded
- Develop your system vision – *What do you want?*
- Know how much you can spend, over what time period
  - Dictates phasing approach
- Develop plan for cut-over to new system
- Plan for long-term support



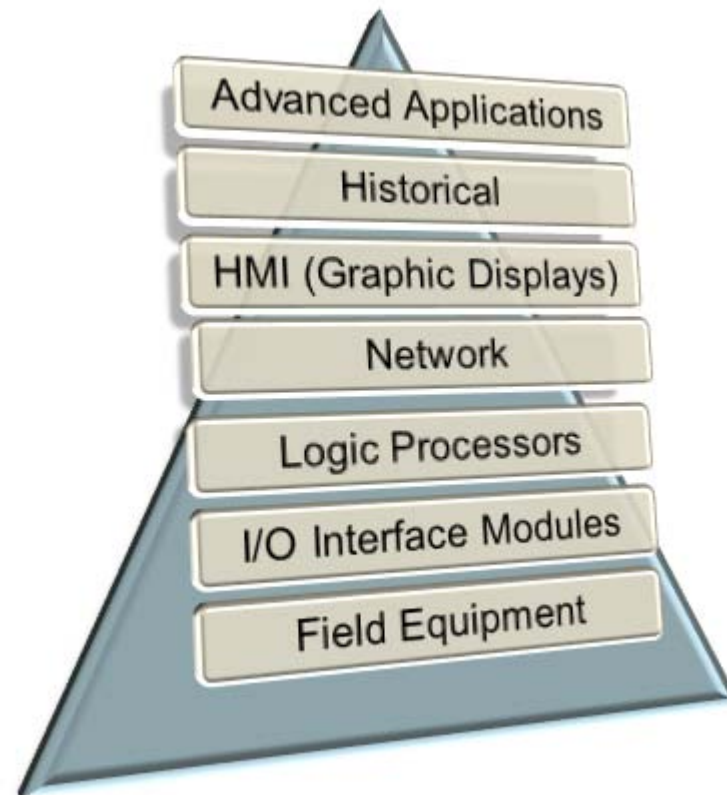
# Replacement options

## HORIZONTAL

- Upgrade each technology layer, one at a time

## VERTICAL

- Upgrade each station or process train, one at a time





# Phased approach extends the overall life of your control system

- Upgrade computer layer to current
- Upgrade network communications
- Replace remote facilities over time

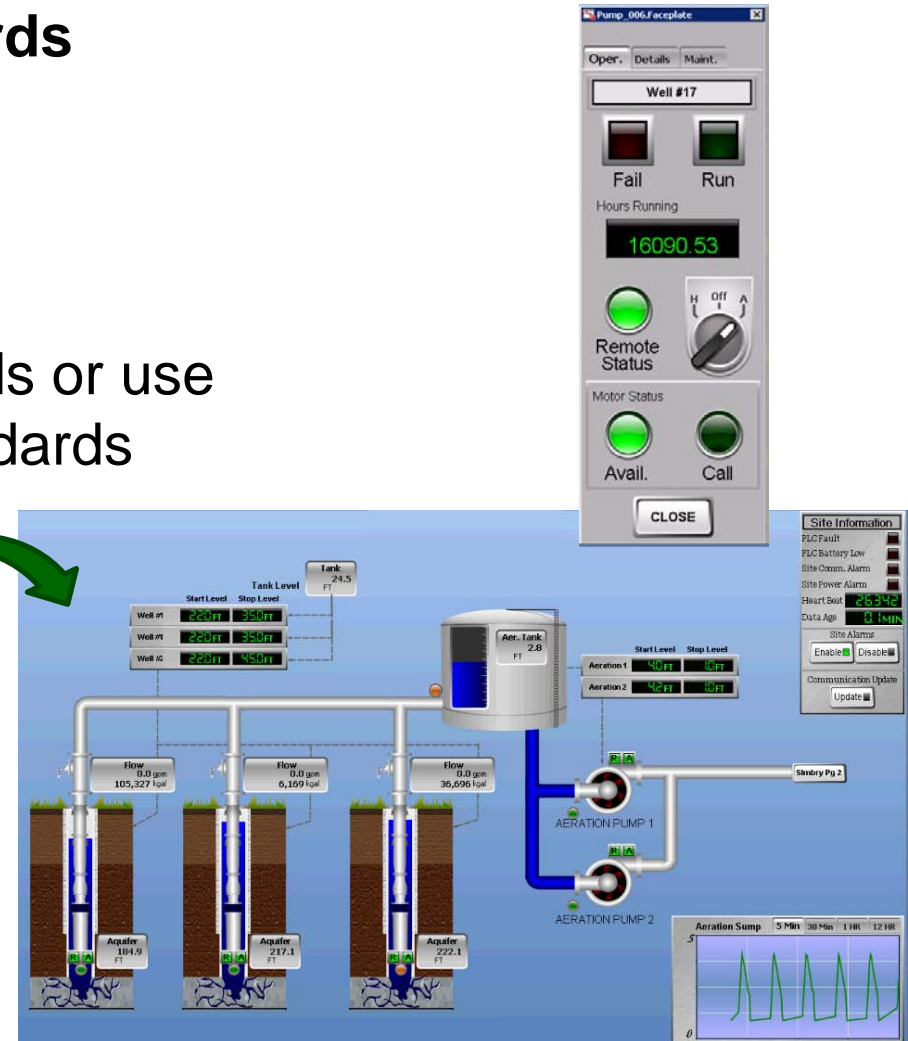
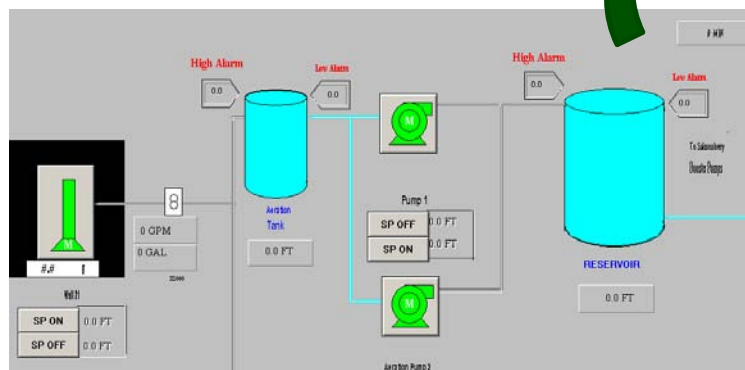
*Don't wait until failure to begin a phased upgrade!*



# Costs are controlled by use of libraries and templates

## Value of Templates and Standards

- Ease of support
- Ease of maintenance
- Uniform way of programming
- Either create your own standards or use a firm with mature delivery standards



# SCADA IN THE DISTRIBUTION SYSTEM

# Remote facilities communicate through telemetry



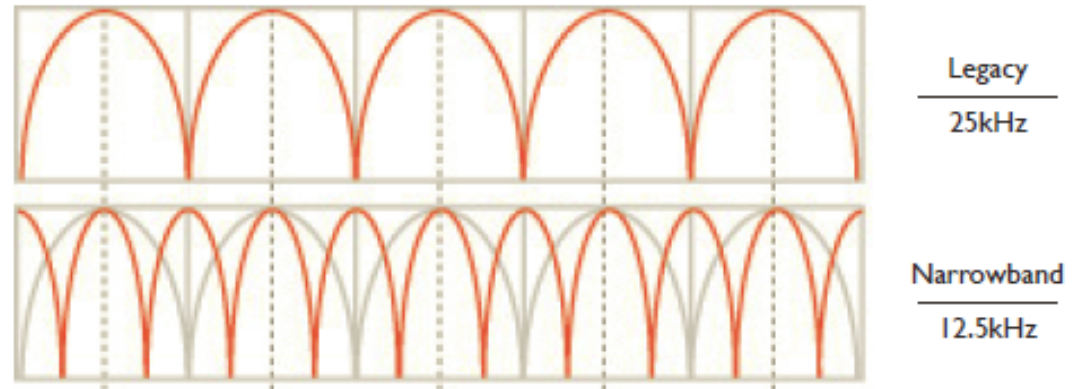


# All 2-way radios must be narrowband by January 1, 2013

- FCC requirement
- Replace old radios – 25 kHz
- Renew license for compliant radios – 12.5 kHz
- Fines of up to \$10,000 per day



## Spectrum Comparison



Narrowband channels allow additional channels to exist in the same spectrum.

# Mobile applications make operator's job easier



Plant site generates data

Secured Hosted Database.  
SQL server based Web Service

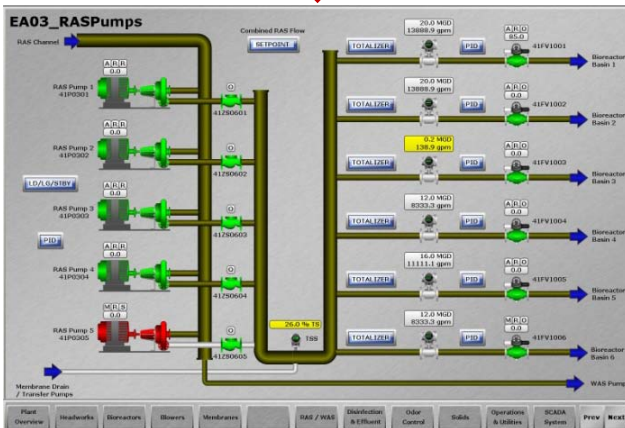
Administrative Control  
Web Login

Third Party PUSH Service

Mobile apps to view and  
analyze data

Secured Transmission via  
SSL under HTTPS Formats:  
SOAP, POX and JSON

Remote View Application



Send data from HMI, Excel, Historian(s),  
Information Server

- On-demand (manually, using Excel Template)
- Real-Time (automatically, using connectors)

# WHAT'S NEW IN SCADA

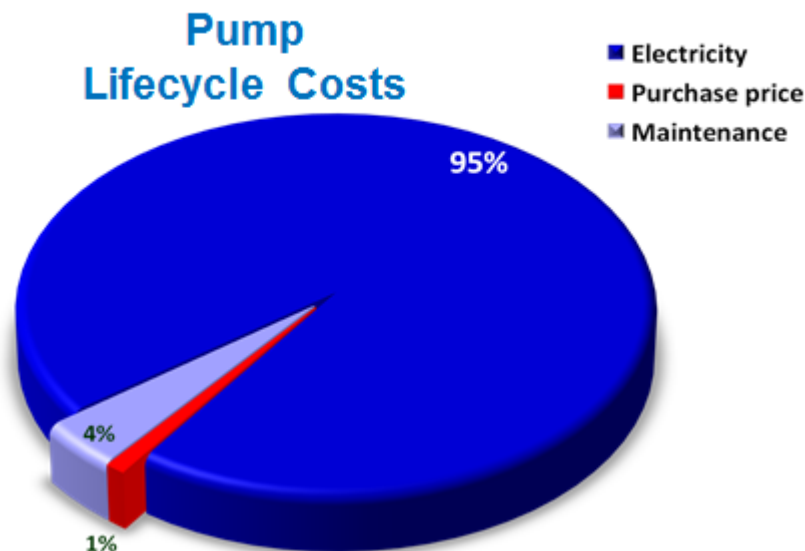


# Hot trends

- Energy management
- Use of mobile devices and “Cloud”
- Virtualization
- Cyber Security

# Newer software tracks energy use...

- Identify malfunctioning pumps
- Proactive preventative maintenance
- Extend equipment life
- Minimize power use



...and reduces operator time

- Control screens show equipment
- Reduce need for operators to drive out to pumps and stations
- Saves time and fuel
- Reduces maintenance and wear on vehicles

# Who's heard of the "Cloud"?

## Explosion in Mobile devices



# Virtualization



## Virtualization

- What is Virtualization?
- What benefits does it have?

## Microsoft's Solution

- Core focus Server 2008 Hyper V

## Hyper V

- Structure of Hyper V
- Implementation

## Fail Over Clusters

- High availability
- Disaster Recovery

# Stepping into the future: immersive virtual reality plant – EYESim for plant crew training



# EYESim- 3D modelling

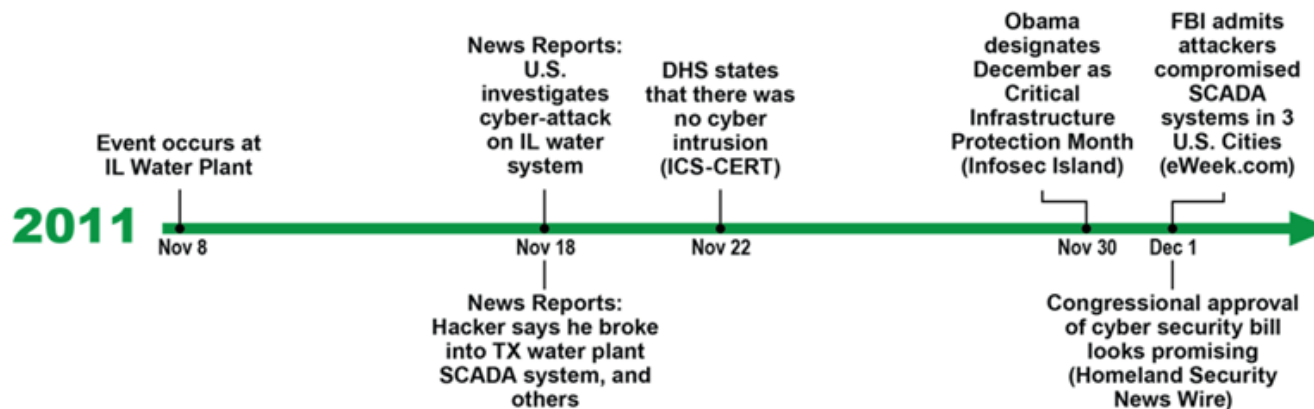


# Critical cyber security news for the water and wastewater treatment industry

- U.S. investigates cyber-attack on Springfield, Illinois water system
- Two water treatment facilities reported possible security breaches of their control networks



## Security Incident Timeline



# What is needed to perform a hack?

## Attacker (threat agent)



- Hacker
- Virus
- Malware
- Insider
- Vendor
- Activist group
- Organized crime

## Communications channel



- Dial-up telephone
- Cellular communications
- Leased communication
- Satellite
- Internet
- LAN/WAN
- Wireless/WiFi
- **Removable media**
- **Laptops**

## Weakness (vulnerability)



- Poor policy
- Insufficient firewall
- **Windows updates**
- **Application patches**
- Poor configuration network
- Un-necessary applications
- **Poorly configured application**
- Default passwords

## Targeted device



- HMI work station
- Application server
- Historian server
- PCs
- Radio equipment
- PLC
- RTU



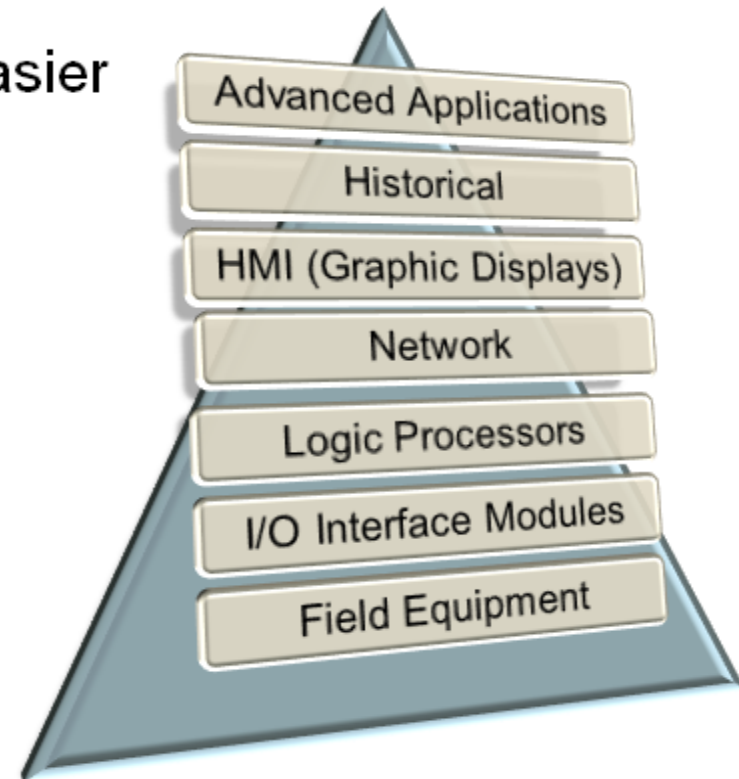
# How to protect against most risks

- Regularly evaluate your assets
- Implement Policies
  - Written procedures, lead by example
  - Training, background checks
  - Access restrictions, ID badges
- Physical Securities
  - Gates, walls, fences
  - Access controls, surveillance
- Regularly Review Cyber Security
  - Business Network and SCADA networks
  - Patch Management
  - Firewall, passwords
  - Separation of networks, data encryption



# Summary - SCADA supports Your mission

- Provides powerful benefits
  - *System monitoring & control*
  - *Efficiency and cost savings*
- Upgrades can be easily phased
- New technology make operator's life easier
- Industry trends to watch:
  - Energy management
  - Mobile applications
  - Virtualization
  - Cybersecurity



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**Thank you-**  
Discussion and Feedback



**PNWS**  
IDAHO • OREGON • WASHINGTON



Michael Karl | CH2M HILL  
*mkarl@ch2m.com*

May 2012

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## Corrosion Protection – Small Systems



*Jerry Duppong, Corrosion Control Specialist*

# Overview

- Corrosion and Corrosion Control
- Protective Coatings for Water Storage Tanks
  - Scheduling
  - Specifications
  - Inspection
  - Warranty
- Buried Infrastructure
- Cathodic Protection

# Corrosion and Corrosion Control



# What is Corrosion?

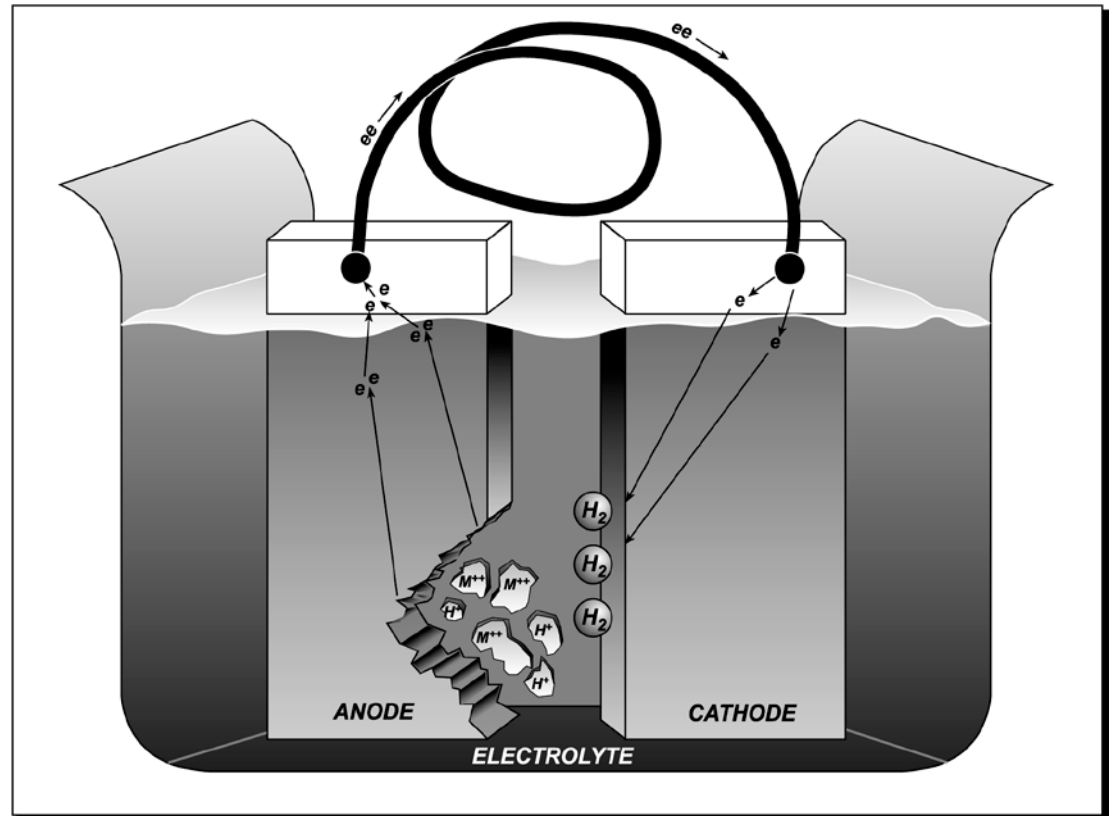
- Deterioration of a material or its properties due to a reaction with its environment
  - Metals
    - 8-9 forms of metal loss or weakening
  - Concrete
    - Dissolving cement paste by acid
    - Swelling/spalling due to sulfate reaction
    - Corrosion of metal reinforcement
  - Plastics and elastomers
    - Loss of mechanical properties

# Metallic Corrosion

4 ingredients are needed for corrosion:

- An anode
- A cathode
- An electrolyte (water)
- A metallic return path

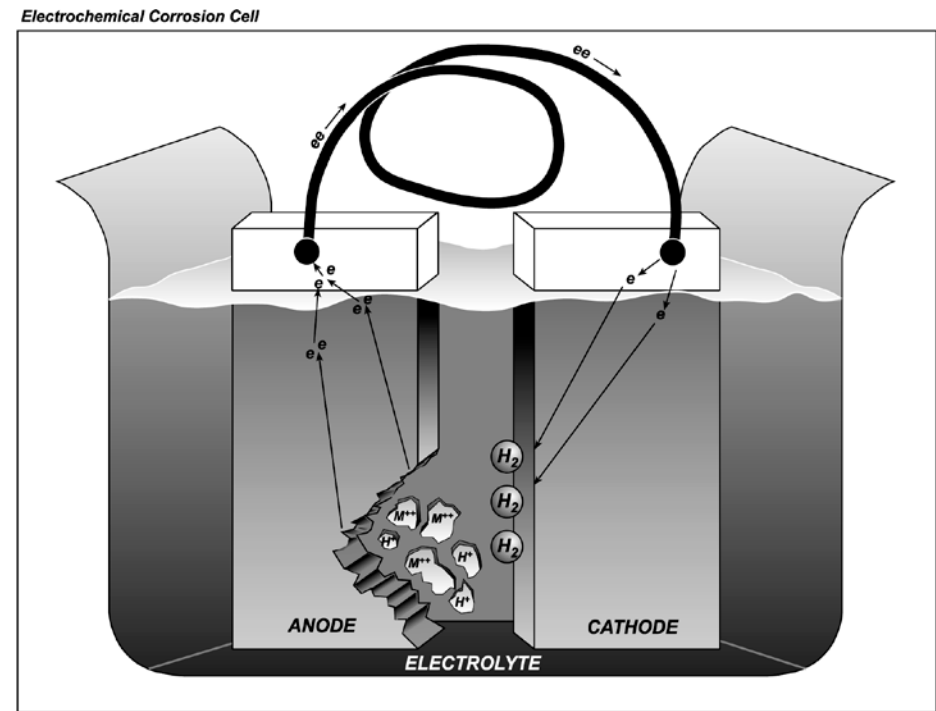
*Electrochemical Corrosion Cell*





# What is Corrosion Control?

- Methods used to extend the useful life of a material to meet the project requirement
  - Materials selection
  - Protective coatings and linings
  - Cathodic protection
  - Modification of environment
    - Water treatment
    - Concrete encasement



# Water Tank Painting



# Data Collection

- Inventory
  - Construction dates
  - Previous recoating projects
    - Products used
    - Date applied
- Physical Inspection
  - Exterior
  - Interior
    - Drain and inspect
    - Observations from roof hatch
    - Diver or ROV inspection
- Document Conditions

# Evaluating Options

- Type of Paint
- Age
- Condition
  - Pressure wash, overcoat vs. full replacement
    - Adhesion
    - Percent intact
- Paint Constituents (Lead, Coal Tar)
- Evaluate Options
  - Exterior
    - Pressure wash and overcoat
    - Full replacement
  - Interior
    - Recoat interior roof vs. entire tank

# Interior Inspection

**Overhead – 40 years**



**Overhead – 30 years**



# Exterior Inspection

**40 Years**



**30 Years**



# Schedule Example

TANK RECOATING IMPLEMENTATION SCHEDULE																											
Legend:	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
T-Topcoat																											
S-Abrasive Blast/Coat																											
P-Pressure Wash																											
C-Cathodic Protection																											
Tank A – Interior	C									S																	S
Tank A – Exterior	T			P			P			P			P			P					T			P			
Tank B – Interior				S																							
Tank B – Exterior				C																							
Tank B – Exterior				T				P			P			P			T						P				S
Tank C – Interior																											S
Tank C – Exterior							P				T								P				T				C
Tank D – Interior												S															
Tank D – Exterior				P							T											P					
Tank E – Interior																	S										
Tank E – Exterior				P				P					P			T								P			

# Coating Systems Available - Interior

## ■ Interior

- NSF certified for potable water contact
- “Conventional” epoxy
  - 2 or 3 coat system
- 100-percent solids, plural component
  - Epoxy
  - Polyurethane
  - Requires special equipment and contractor training



# Coating Systems Available - Exterior

- Exterior
  - Alkyd (oil) based paints
  - Epoxy primer/polyurethane enamel finish
  - Moisture cured urethane
  - Fluoropolymer polyurethanes
  - Siloxanes

# Other Considerations

## Repainting Existing Tanks

- Structural Improvements
- Pit/Structural Repairs
- Containment
  - May be required to contain fugitive dust
  - May be required to contain lead paint residue
  - May be required to control environmental conditions
- Environmental Controls
  - Heat and dehumidification
    - Location
    - Time of year
- Cathodic Protection

# Items to Consider during Design

- Status of Existing Coatings and Corrosion
- Lead Based Paint
  - Hygiene
  - Waste collection, storage, testing, disposal
- Hold Points
  - Structural inspections and repairs
- Environmental Controls
  - Dehumidification
  - Heat
- Containment
  - SSPC Guide 6
- Extended Warranty
  - 2 to 3 years

# Inspection Considerations

- Options
  - Owner staffed
  - Owner staffed w/ periodic assistance from Consultant
  - Full time, NACE Certified Coating Inspector
- Influencing Factors
  - Owner experience
  - Lead based paint removal
  - Application of special coatings
    - Plural component coatings
  - Contractor experience
  - Difficult working environment
    - Cold, humid

# Construction Observations and Records

- Contractor Information
- Dates
  - Beginning of surface preparation
  - Primer application
  - Application of subsequent coats
  - Coating completion date
  - In service date
- Environmental Conditions
  - Daily temperatures (high and low)
  - Relative humidity
- Site Visit Frequency
  - Every day
- Equipment/Procedure Verification

# Inspection Goals

**This**



**Not This**



# Elevated Tank

- 1960 Construction
- Exterior Repaint in 1978
- Interior Repaint in 1996
  - Plural component polyurethane
  - Very good condition, 2009
- Exterior Overcoat in 1997
  - Acrylic Latex
  - Very good condition in 2010
- Owner Inspected
  - Consultant on call



# Elevated Tank

- 1976 Construction
- Repainted in 2001
- Original Paint
- Exterior Overcoat
  - Pressure washed
  - Spot prime
  - Brush and roll
  - Acrylic Latex
- Interior Recoat
  - NSF Epoxy, 3 coats
- Owner Inspected
  - Consultant on call





# Elevated Tank

- 1910 Construction
- Repainted several times
- Paint compatibility issues
- Repaint in 2004
  - Exterior – blast, epoxy primer, polyurethane finish
  - Interior – touch up
- Containment Provided
- Owner Inspected
  - Local inspector on call



# Containment



# Concrete Tanks

- Coating Requirements
  - Aesthetics
  - Water seepage
- Abrasive Blast Surface Preparation
- Concrete – Dry Surface
- Exterior Paint
  - Often requires interior coating
  - Use a product that “breathes”
  - Select a light color
- Interior
  - Elastomeric (stretches)
  - Epoxy (rigid)
- Coat with Decreasing Temp



- 1970s Construction
- 2010-2011 Paint
- Acrylic Exterior Paint
- Polyurea Interior Coating
  - Interior scaffolding
- Contained
- Dehumidification
- Owner Inspection
  - Consultant on call



# Warranty

- Include Provisions in Specification
- Two Year Minimum Recommended
- Drain Tank and Inspect
  - Invite contractor
  - Identify defects
  - Repair
  - Reinspect repairs in one year
- Critically important
  - Can be very costly if major defects are not discovered in time
- Diver Inspection
  - If tank cannot be drained

# Water Tank Cathodic Protection

- Operation During Warranty Period
  - Turn off and disconnect
- Operation After Warranty Period
  - Retain trained professional to energize and adjust
  - Monitor monthly to verify operation
  - Retain trained professional to check and adjust on annual basis

# Buried Infrastructure



# Premature Failures

- Costly
  - Leak repair
  - Infrastructure replacement
- Confidence in Reliability
- Lack of Redundancy
- Water Loss
- Property Damage



# Transmission Pipeline

- 24-inch DIP <15 years old
- Corrosion Protection
  - Bonded joints
  - Polyethylene encasement
  - Cathodic Protection
- Difficult Repair
  - Leak on bottom
  - Section replaced
  - Cold weather
- Possible Contributing Factors
  - Broken bond wire
  - Incomplete polyethylene
  - Localized corrosive soil



# Fire Hydrant

- Ductile Iron Pipe and Fittings
- Less than 10 years old
- Corroded fasteners
  - Carbon steel
  - Ductile iron



# Distribution Pipeline

- 8-inch DIP, <20 Years Old
- Polyethylene Encased
- Excavated Pipe - Test
  - Removed
  - Abrasive blasted
  - Pressure tested
- Primary Corrosion Causes
  - Extremely corrosive soils
  - Polyethylene installation
- Lessons Learned
  - Corrosion can occur under polywrap
  - Cement mortar bridges holes



# Force Main

- 14-inch DIP, <20 years old
- Corrosion Under Polywrap
- High Salt Content Groundwater
  - Pitting
  - Roughened surface
  - Slight hydrogen sulfide odor



# Water Transmission Pipeline

- 60-inch CCP, 25 years Old
- Corrosion at Mortar Defects
  - Bottom of pipe only
    - Mortar spalling
  - Corrosive soil
- Mortar Integrity is Important



# Investigation

- Document Conditions
  - Pipe Condition
  - Protective coating/polywrap
  - Photographs
- Measure Pit Depths
  - Pipe pit gauge
- Look for Unique Conditions
  - Bacteria (hydrogen sulfide)
  - Stray current
  - Soil mixtures
  - Dissimilar metals
- Soil Samples
  - Acidity, salts

## PIPE CONDITION/LEAK REPAIR REPORT FORM

Location \_\_\_\_\_  
 Station No. \_\_\_\_\_ Date \_\_\_\_\_ By \_\_\_\_\_

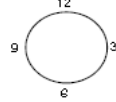
**Pipe Information**  
 Pipe Diameter \_\_\_\_\_ inch  
 Installation Date \_\_\_\_\_  
 Pipe Type  
 Galvanized  Copper  
 Cast Iron  Steel  
 Ductile Iron  CCP  
 Other \_\_\_\_\_  
 External Coating \_\_\_\_\_  
 Internal Lining \_\_\_\_\_  
 Other Nearby Utilities \_\_\_\_\_

**Joint Type**  
 Welded  Rubber Gasket  
 Flanged  Lead-Caulked  
 Other \_\_\_\_\_

**What Part of Pipe Was Damaged**  
 Pipe Barrel  
 Pipe Bell  
 Valve  
 Flange Nuts/Bolts/Ties Rods  
 Saddle  
 Corp Stop  
 Flexible Coupling  
 Other \_\_\_\_\_

**Cause of Pipe Failure**  
 Mechanical  
 Rock  
 Settlement  
 Other \_\_\_\_\_  
 Construction Accident  
 Corrosion Damage  
 Internal  
 External  
 Pitting  
 General Corrosion  
 Graphitized Cast Iron  
 Other \_\_\_\_\_

**Size/Type of Leak**  
 Circumferential (Circular) Break  
 Split (\_\_\_\_\_ inch long)  
 Small Hole (Less than 1 inch)  
 Large Hole (\_\_\_\_ by \_\_\_\_ inch)  
 Other \_\_\_\_\_

**Mark Location of Leak**  
  
 Looking  
 Upstream  
 Downstream

**Pipe Condition (In Your Opinion)**  
 Length of Pipe Exposed \_\_\_\_\_ feet  
 External Condition  
 Excellent  Questionable  
 Good  Bad  
 Fair  Very Bad  
 Internal Condition  
 Excellent  Questionable  
 Good  Bad  
 Fair  Very Bad

**Soil Conditions**  
 Depth of Cover \_\_\_\_\_ feet  
 Principle Soil Type  
 Clay  Gravel  Mixed  
 Loam  Rocky  
 Sand  Glacial Till  
 Groundwater at \_\_\_\_\_ feet  
 Soil Resistivity \_\_\_\_\_ ohm-cm  
 Soil Box  Single Probe  Wenner 4-pin  
 Depth of Test Measurement \_\_\_\_\_ feet

**Repair Methods**  
 Type of Repair  
 Leak Clamp  Sleeved  
 Saddle  Recaulked  
 Welded  Repacked Valve  
 Flex Coupling  Replaced \_\_\_\_\_ feet  
 Other \_\_\_\_\_  
 Type/Size of Anode Installed  
 Zinc \_\_\_\_\_ pound  None  
 Magnesium \_\_\_\_\_ pound  
 Test Station Installation  
 Flush  Post  None  
 Location \_\_\_\_\_

**Other Notes**  
 See Reverse Side  See Attached Sheet

# Corrosion Protection at Leak Repairs

## ■ Repair Coatings

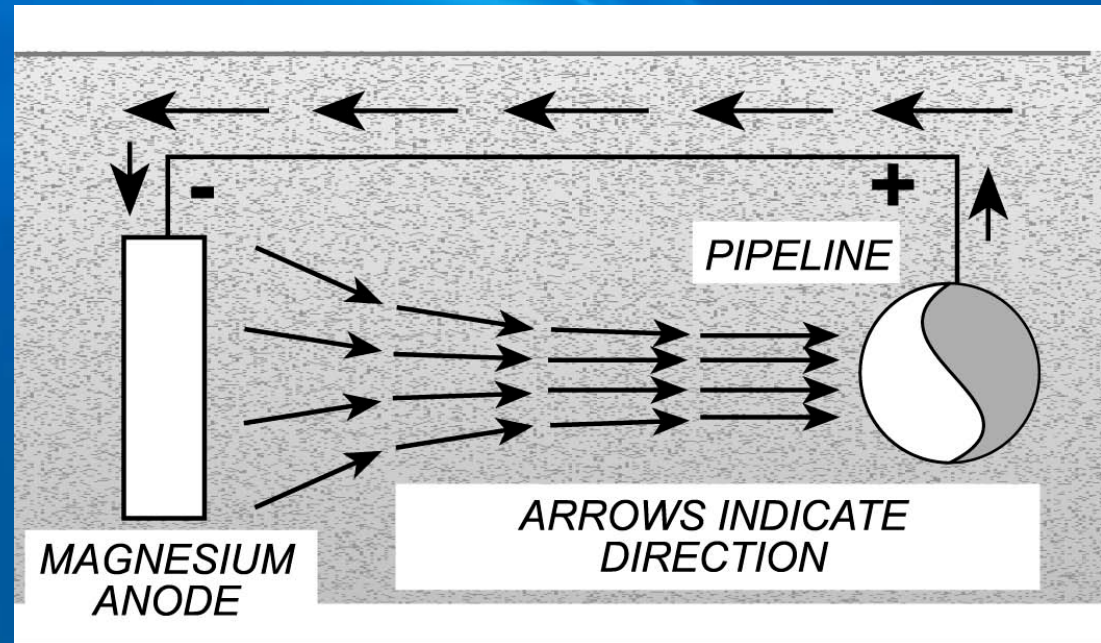
- DIP
  - Polywrap (AWWA C105)
- Steel/DIP
  - Wax tape (AWWA C217)
  - Polyethylene tape (AWWA C209)
  - Heat shrink wrap (AWWA C216)
  - Fast cure epoxy
- Cement mortar coated steel
  - Cement mortar (AWWA C205)

## ■ Galvanic Anodes

- Localized Corrosion Protection
- Relatively Inexpensive
- Wire Connections to Pipe
  - Most difficult part



# Cathodic Protection





# Cathodic Protection Systems

- Application
  - Water tanks
  - Buried pipe
  - Submerged equipment
- Galvanic Anodes
  - Magnesium or zinc
  - No power source
- Impressed Current
  - Rectifier, anodes, connecting wires
  - More complicated
  - Requires electrical power

# Water Tanks

- Operation
  - Relatively simple operation
  - Usually impressed current
  - Read rectifier meters
  - Check annually
    - By trained professional
    - In spring (cold climates)
- De-Energize After Interior Repaint
  - Re-Energize after warranty period



# Buried Pipe

- CP More Complex
- Important Maintenance Factors
  - System must be operational
  - “Shorting”
    - Broken insulators
    - Inadvertent electrical contact
  - Lost test stations
  - Damaged wiring
  - Broken bond wires
  - Damaged rectifiers
    - Transient voltages (lightning)
    - Damaged diodes
    - Other



# Rectifier Status

- Check Meters Monthly
- No Voltage or Current
  - Line voltage issues/blown fuse
  - Diode damage
- Zero Current
  - Damaged wire
  - Damaged rectifier
  - Anodes consumed
- Reduced Current
  - Diode damage
  - Line voltage issues
  - Dry soil
  - Anode consumption
  - Wire damage

# Maintenance

- Check Annually
  - Impressed current systems
  - Galvanic anode systems
    - Critical infrastructure
    - Complex system
  - Test stations
  - Electrical isolation
- Check 3 to 5 years
  - Galvanic anode systems



Questions



# Securing Remote Stations

*Dave Hall, Operations Manager, Lakewood Water District  
Kim-Fu Lim, Managing Partner, iCrescendo, LLC*



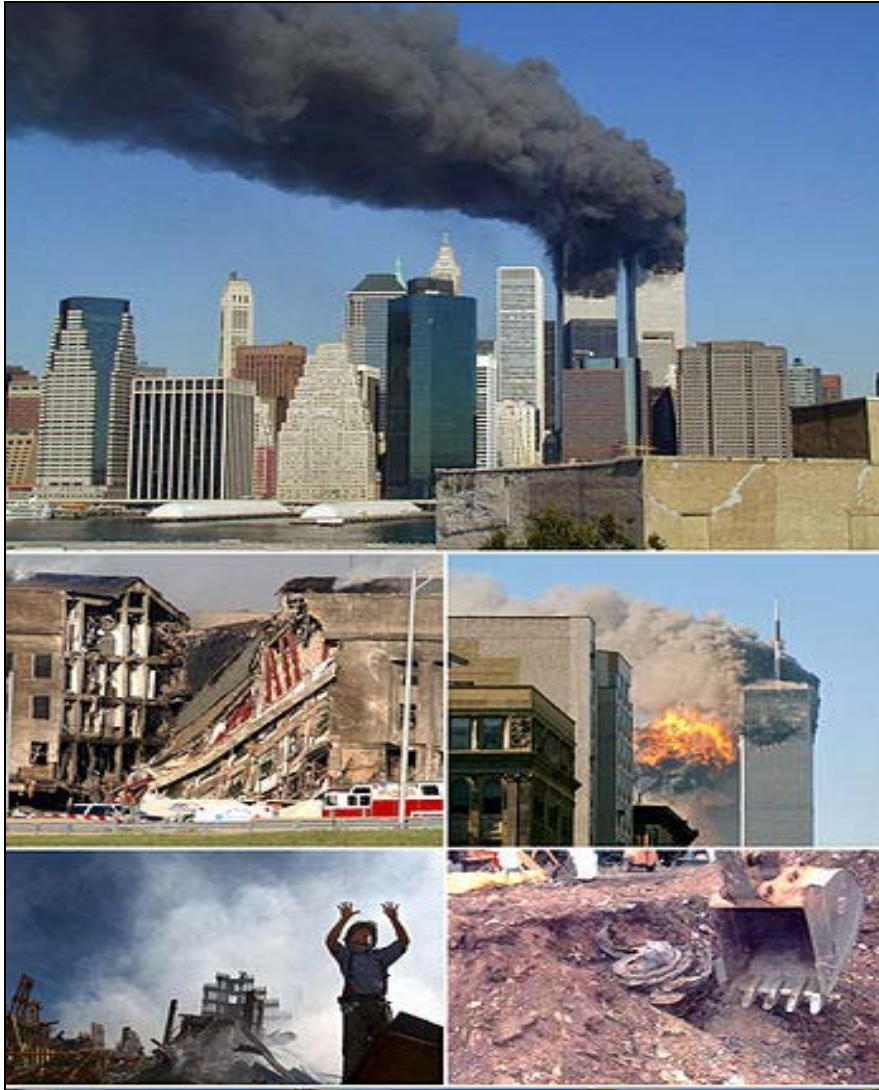
# Agenda

- System security...why is access control necessary for remote stations
- Possible means and methods...the Lakewood Water District story
- CyberLock systems...advantages and benefits
- Total security systems...examples of what's available
- Questions





# Business Drivers



- SAFE DRINKING WATER ACT
- 2002 BIOTERRORISM CLAUSE
- RAM METHODOLOGY
- VULNERABILITY ASSESSMENT
- EMERGENCY RESPONSE PLAN
- DEPARTMENT OF HOMELAND SECURITY
- IDENTIFY POTENTIAL THREATS
- STRATEGIES FOR SECURING FACILITIES



# Primary Goals

**SAFEGUARD EMPLOYEES**

**SAFEGUARD PUBLIC**

**SAFEGUARD PROPERTY**



# Secondary Goals

- Meet the three primary goals
  - Cost effective
  - Simple but functional
  - Easily obtainable technology
  - Easy interface to existing SCADA
- 
- Cost effective O&M
  - User friendly
  - Ability to track and verify
  - Not easily bypassed
  - Adaptable to changing threats and conditions



# What Needs Securing?

- Remote sites
- Gates
- Well buildings
- Booster stations
- Tank hatches
- Tank access ladders
- Emergency backup generators
- SCADA/Communications
- Main office
- Personnel



# Office Security

## ACCESS CONTROL



# Office Security

## **MONITOR AND OBSERVE**

- Motion sensors



# Office Security

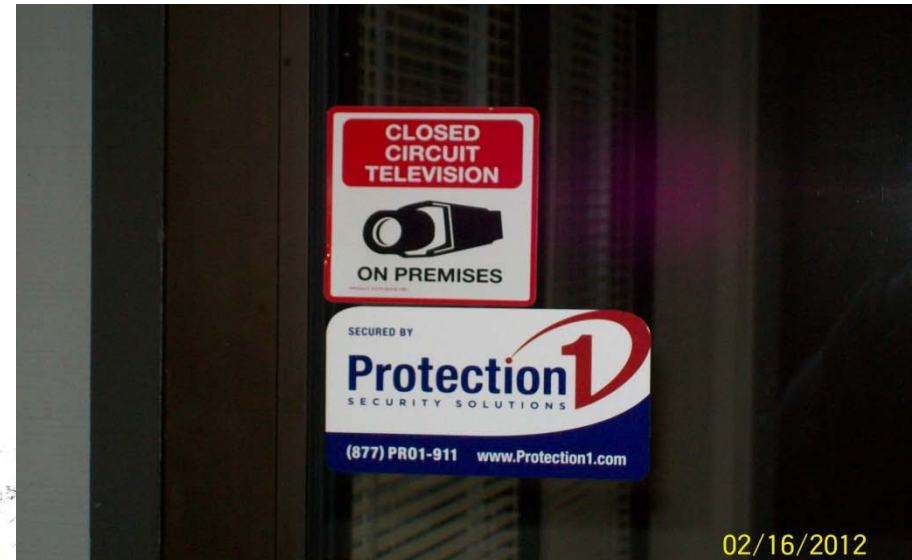
## **OBSERVE AND RECORD**

- Cameras



# Office Security

- Security system
- Upgraded fencing
- Added exterior lighting





# CyberLock System

- Cost...less than 1/3 the projected cost of alternative card swipe systems
- Less secondary paraphernalia...for remote sites, everything is contained in the keys
- Continues to function during power outages
- Most O&M done in-house
  
- Minimal cost for replacing locks and keys
- Upgradable software systems
- Data archiving
- Ability to verify and track personnel
- User friendly
- Not easily recognizable system...not easily by-passed



# Easily adaptable to existing lock sets

## No wiring or battery is required at the lock.

The lock installs without wiring of any kind, and does not contain a battery. The power required to open a lock comes from the battery in the key.

## CyberLocks cannot be picked.

CyberLocks have no keyway, and cannot be picked like a mechanical lock. CyberLocks resist forced rotation, and are designed to remain in the locked position if tampered with.



# Simple to manage

<b>Intelligent Locks</b>	
<b>Smart Keys</b>	
<b>Communicators</b>	
<b>Software</b>	



# Remote Site Security

## **ANTI-INTRUSION DETER AND DETECT**

- DOOR CONTACTS



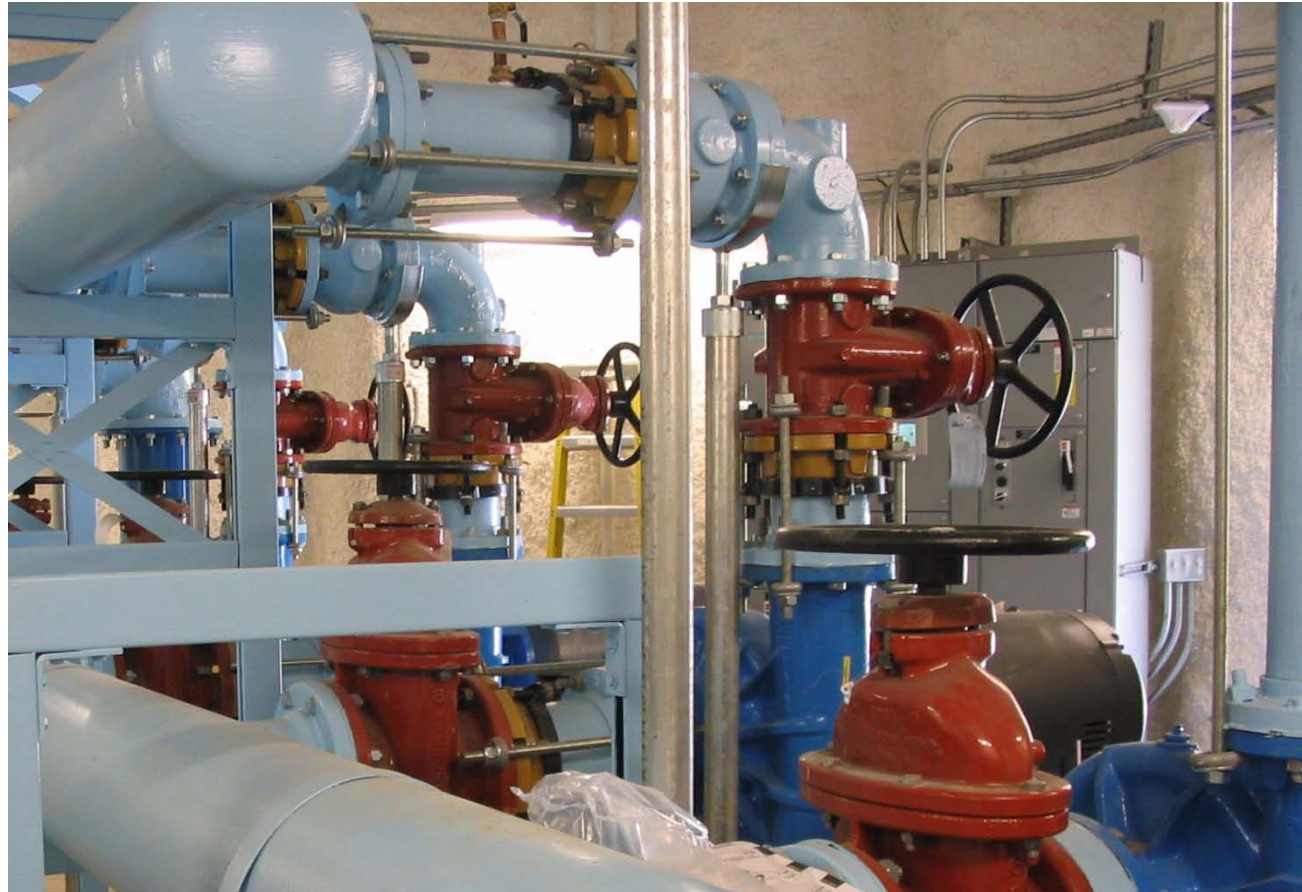
Disclose & distribute solely to iCrescendo partners having a need to know.



# Remote Site Security

## ***ANTI-INTRUSION DETER AND DETECT***

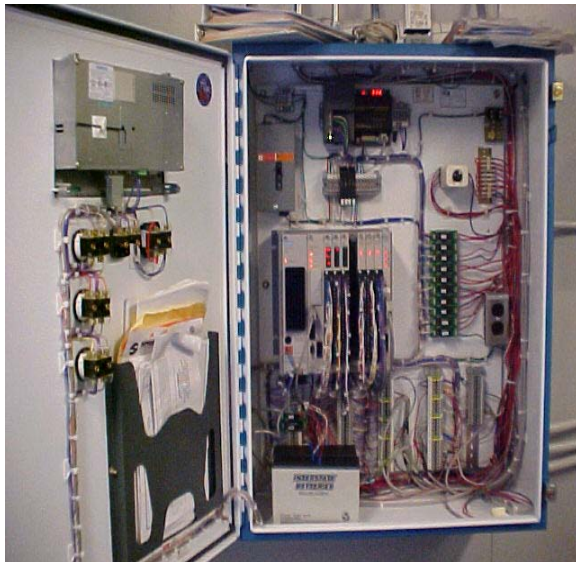
- Motion sensors



# Remote Site Security

## **ANTI-INTRUSION DETER AND DETECT**

- LIGHTING
- EXTERIOR HORN/STROBE
- SCADA



# Remote Site Security

## ANTI-INTRUSION

- Educating the neighbors
- No trespass signs
- Monetary notification award



## REWARD

The Lakewood Water District has recently experienced vandalism at its Nyanza Tank site located at 127<sup>th</sup> Street and Rebecca Drive. The District is offering a **\$500.00 reward** for information leading to the arrest and conviction of the individual or individuals responsible for spray painting graffiti on this District property.

According to the 2002 Bioterrorism Clause of the Safe Water Drinking Act: *Anyone tampering with a public water supply system is subject to 20 years imprisonment with a \$1,000,000 fine. Anyone attempting to tamper with a public water supply system is subject to five years imprisonment and a \$100,000 fine.*

In this post 9-11 era, acts of vandalism once considered simple juvenile pranks can no longer be tolerated. Guaranteeing public health and safety is the District's first and foremost priority. Repair costs resulting from acts of vandalism continue to grow. Unfortunately, these costs will eventually have to be passed on to the rate payer in the form of higher rates. Therefore, the District is asking for your help by providing any information you may have or by reporting any suspicious activity on District property. Please help us protect our water supply and facilities that help bring clean, safe water to you and your neighbors.

For reporting information please call:

Lakewood Water District  
253 588-4423 or  
253 588-2296 after 5:00 pm Monday through Friday, weekends, and holidays.

Or you may call the City of Lakewood Police Department:  
253 830-5000 or  
9-1-1

Thank you very much,

Dave Hall  
Lakewood Water District



# Remote Site Security

## **ANTI-INTRUSION**

- Fencing

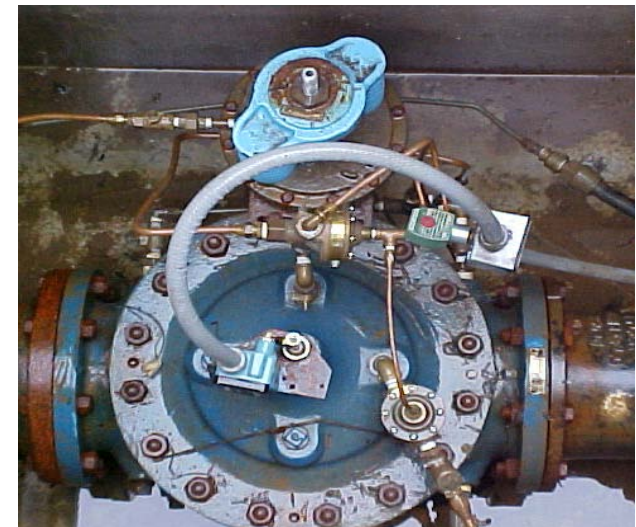
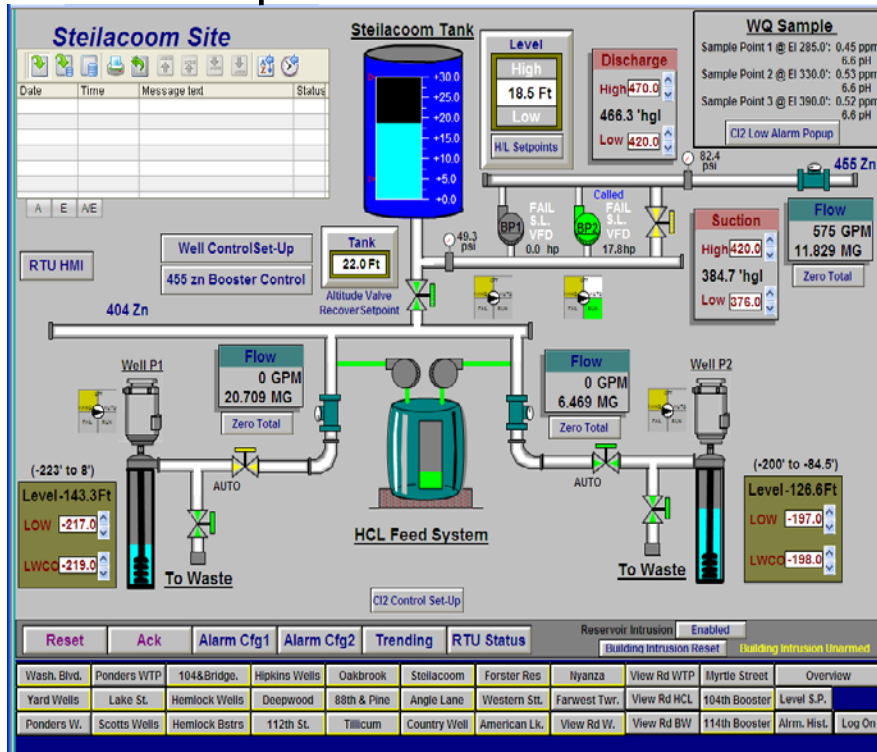




# Remote Site Security

## ANTI-CONTAMINATION

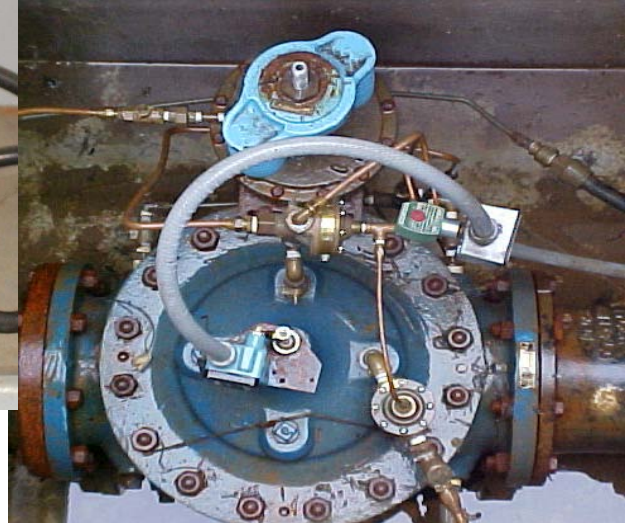
- Detection and notification
- Site isolation
- Alarm protocol



# Remote Site Security

## ***SEISMIC EVENT***

- Earthquake sensor
- Site isolation
- Alarm protocol



# Remote Site Security

## ALTERNATIVE STRATEGIES

- Police patrol
- Private security patrols
- Remote cameras
- Up to date cross connection programs



\* Conveniently located in Lakewood, WA

### Freedom Security Services

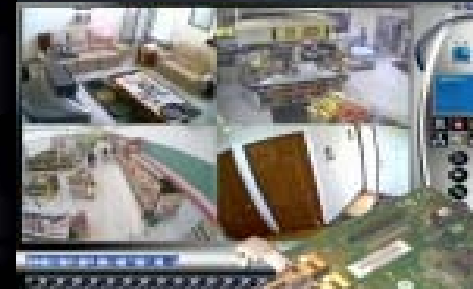
253-572-4081  
www.freedomsecurity.us

\* Don't delay - Call today

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- Retail Security
- Alarm Systems
- CCTV Camera Systems
- Apartment Security
- ATM Security
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RELIABLE SECURITY SYSTEMS

A security guard in a uniform is seen from behind, looking at a wall of multiple security camera monitors displaying various scenes.

Security Eyes Pro Drill System

