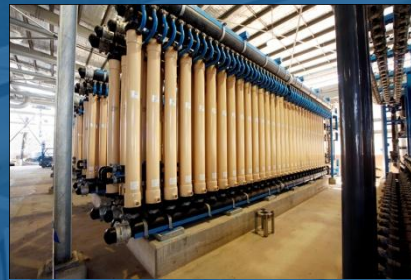


CH2MHILL®

Real-Life Users Talk the Talk



The Face of SCADA Security, SANS 2012

*Michael Karl
mkarl@ch2m.com*

Agenda

- Water & Wastewater Industry
- Common Vulnerabilities
- Recent Water Security Events
- Q&A



Water - A Precious Liquid

**3/4 OF THE PLANET
COVERED BY WATER**

ONLY 2.7% IS FRESH WATER

**IN URBAN AREAS
79% HAVE ACCESS TO PIPED WATER**



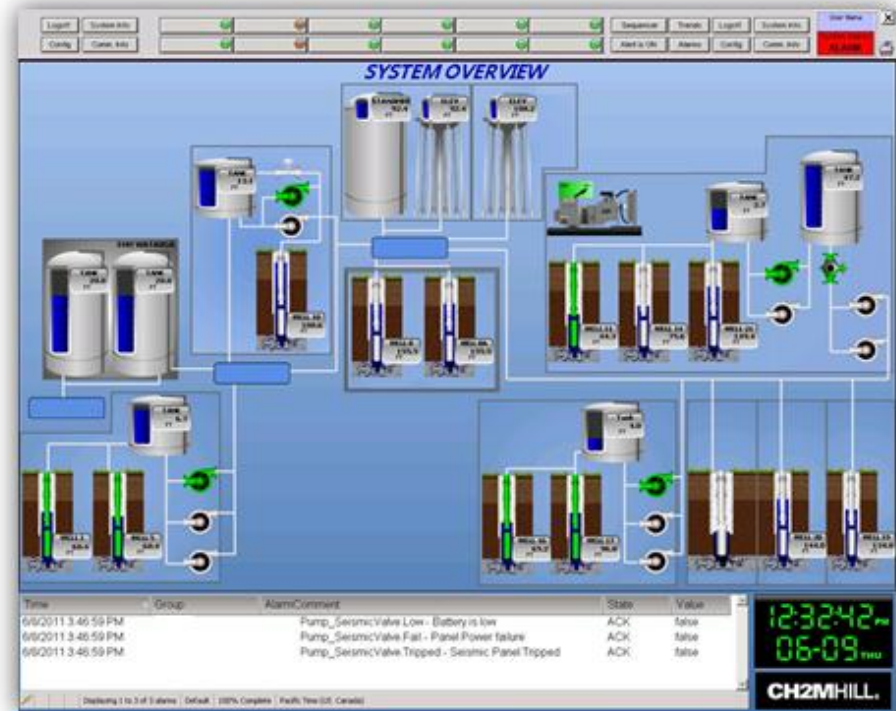
**IN RURAL AREAS
ONLY 34% HAVE ACCESS TO PIPED WATER**



**TODAY ABOUT 1 BILLION PEOPLE DO NOT HAVE ACCESS TO SAFE DRINKING WATER.
8 OF 10 PEOPLE WITHOUT ACCESS TO AN IMPROVED WATER SOURCE LIVE IN RURAL AREAS**

Water Utility Overview

- Utilities are sized based upon service area resulting in greatly varied budgets
- If compromised there are extreme impacts to society and potentially, loss of life
- The industry is slow to upgrade and utilizes obsolete equipment
- Facilities aren't staffed 24x7 resulting in remote alarm notification



Common Vulnerabilities in the Industry

- Utilities serving over 1 Million to 1,000 customers have nearly the same common challenges.
- Common Vulnerabilities:
 - Vendor dial-up access to PLCs directly
 - Routable public IP addresses
 - Many dual homed computers
 - Unsecure wireless networks
 - Windows XP and Server 2000
 - Unpatched computers
 - Operators who are afraid of passwords



Lack of Regulation

US Government Accountability Office (GAO)

Subject: Information Technology: Federal Laws, Regulations, and Mandatory Standards for Securing Private Sector Information Technology Systems and Data in Critical Infrastructure Sectors

“For drinking water and water treatment, the sector’s applicable law may be enforced through

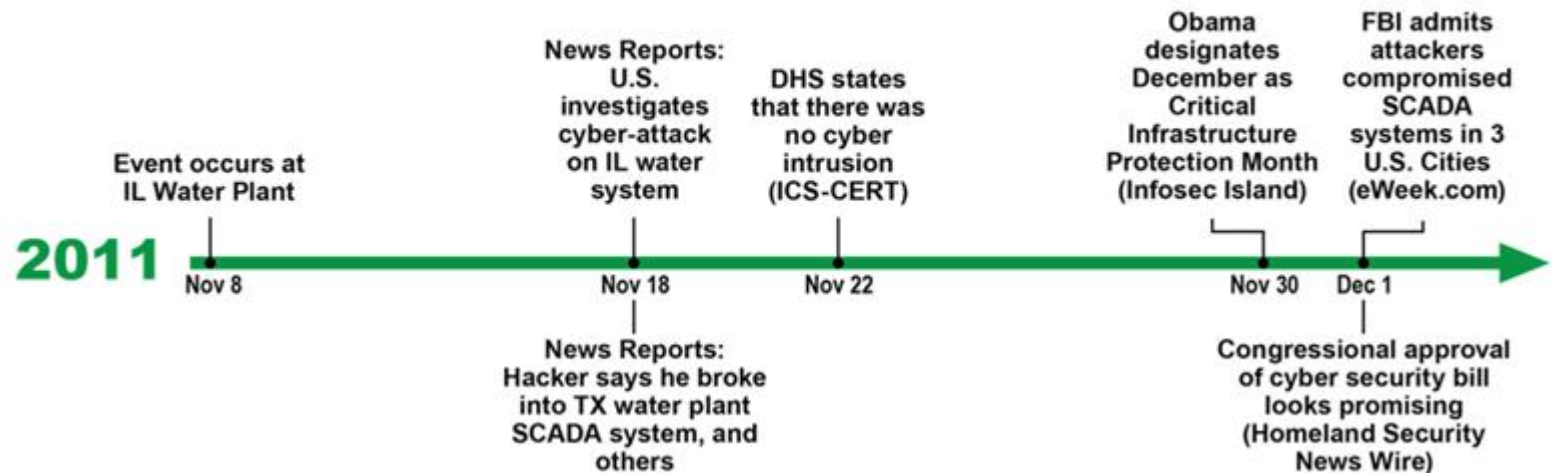
- *administrative orders,*
- *civil monetary penalties, and*
- *court injunctions.*

Specifically, the law provides that a community water system in violation of the law could be fined up to \$25,000 per violation.”

Water Industry Security Makes the News!

- 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



Water ICS Security – Where Now?

- Utilities are looking to implement more mobile technologies
- Regulations will force the industry to change
- Security culture needs to be developed (similar to safety)
- Continued training for officials/managers and operators



Questions?

Michael Karl

**Regional Technology Leader
Industrial Control Systems**

**michael.karl@ch2m.com
(425) 749-2020**