

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: US EPA Region 5: Jodie Opie

FROM: Bob Babcock

DATE: 11/16/11

SUBJECT: Nashville, TN AWWA Water Security Congress Summary Report

The following is a summary report of the Water Security Congress that was held in Nashville, TN on September 11-14, 2011.

I want to thank US EPA for the funding for the water security program which allowed me to attend this conference for a number of years.

The caveats on this report are many: I couldn't attend all of the presentations so my comments are limited to the presentations I attended; I could not understand all of the information presented, so my comments are my own as best as I could understand the presentation; my comments are in chronological order and not priority order.

1. Water Security Committee: Sunday 9/11/11 at 6:30pm; Chair: Gary Sturdivan [gsturdivan@mac.com]: there is a call for papers for the 2012 Dallas ACE with a 6.5 hour session on security; the Eastern seaboard August 2011 flooding due to Hurricane Irene hurricane caused a lot of damage, e.g. emergency generators were damaged, and the PA and VT WARNs were activated; the 2012 Water Security Congress and Distribution conference will be in St. Louis and John Moyer will chair the water security portion of the conference and will need to have a strong attendance in order to justify this specialty conference; need to get the AWWA TEC to approve a policy statement change for the focus of the water security committee from security to emergency management; emergency management is a broader focus than security and includes all hazards – natural and unnatural; G 430 AWWA security standard is not well known and awareness of it is needed; apparently there is an issue of primacy agency involvement with state WARNs; EPA is pursuing the contaminant warning system program at 5 metropolitan sites; possible inclusion of water security program in climate change legislation.
2. Nashville flood of 2010: Scott Potter, Nashville Metro Water Services: Fifteen inches of rain fell on the Nashville metro area from April 30, 2010 through May 2, 2010; 150 of 750 staff not available; make USGS a local partner; need 2 foot contour levels on maps; river normally 17 feet – and was at 52 feet or a 35 foot rise; initial hoarding of water at stores; EOC distributed bottled water; a week before EOC press conference training of staff in front of video cameras was very helpful experience; took 4 months to get water plant at 100%; significant difference between flood way, i.e., flowing water, and flood plain; fill clarifiers or they will float; stop assessing late payment fees.
3. Multihazards natural disasters: Dr. Lucille Jone: USGS: California has short fault lines vs New Madrid where the faults are long, i.e. the earthquake ends at the fault line;

unreinforced structures, i.e. those built without steel reinforcing, are most likely to sustain the greatest damage during an earthquake; faults are oval; valleys have more shaking due to river sediments vs hard rock; Midwest will have longer spread of shaking due to the soft clay soil and longer fault line vs the west due to rockier soil and shorter fault lines; multihazards, e.g. Japan's earthquake and tsunami and loss of electricity, are likely, e.g., Katrina hurricane and the levee failure; during disaster likely to have primary disaster along with secondary and possibly tertiary disaster; water system is critical.

4. Gaylord Opryland's Flood Recovery and Rebuild: Monty Allsbrook, VP Engineering: Opryland has 4,000,000 square feet; set up crisis center to evacuate to a nearby high school; used bus fleet from high school; couldn't pump for 3 days because there was no place to pump to; used same engineering firm and mechanical and electrical contractors that built the property; filled 1,180 dumpsters; had to test everything; evacuation planning was very helpful; \$200 million to rebuild in 6 months.
5. AWWA Partnership Program – How it works to protect Water Quality: Robert Cheng, Long Beach Water Department: 0.1 NTU voluntary goal; southwest treatment plants; akin to ISO 9001 / 14001 voluntary standards for QA/QC; drives excellence with goals of always > 20 psi, >0.4 mg/l Cl₂, and < 15 breaks / 100 miles; long term – don't focus on one year.
6. LAN Separation of SCADA and business networks: A case study: City of Glendale: Jacques Brados: separate and redundant routers; separate LANs; large square miles but flat terrain; T1 at 2 MB / sec vs. a couple of 100 MB / sec desirable; radio needs a path study; centrally manage all plants from one location.
7. The Worm – Stuxnet; The Cure – NIST 800: Anand Rajendra, Malcolm Pirnie, Inc.: industrial control system (ICS) aka SCADA; administrative non-technical vulnerability; no specific policies or training or requirements; technical vulnerability; threats many; gap is increasing between capabilities – utilities vs terrorists; RISI = Repository of Industrial Security Incidents; directed toward centrifuges in Iran; segmented networks desirable; NIST 800 series/ ISA 99 series / ISO 27000 standards; no standards for the Water Sector; NIST – 800 : NERC – CIP handbook.
8. Understanding Water Sector Information Security, Terminology and Governance: Captain Nelson Mix, US PHS/EPA: "History doesn't repeat itself...but it does rhyme"...Mark Twain; Bioterrorism Act of 2002 subsection 1433 requires Vulnerability Assessment (VA) and Emergency Response Plan (ERP).
9. Leveraging Existing Resources to Develop an Early Warning System for Consumer Calls: Yves Mikol, NYC Dept of Environ. Protection: 9,000,000 residents; 3 year grant from US EPA; consumer calls tracking via call center with GPS; manned 24/7; 311 DEP calls; 50,000,000 calls to date with 0.1 % drinking water; query database daily for water quality issues versus auto-routing system real-time; YSI specialist for alarms; event detection algorithms with action level protocols; 9 years of data established background; boroughs, i.e. Bronx, Staten Island versus Manhattan versus day of the week versus season; metallic taste associated with system wide algal bloom; queries are mapped; sampling is water quality manual sampling versus automated; data within 1 standard deviation unit defines response.

10. Philadelphia Water Department Contamination Warning System Project – Analysis of Customer Complaints Data Generated Through Work Order Management System: Rami Raad, CH2MHill: pilot of the US EPA funded contaminant warning system; consumer complaint program with 1.6 million customers; Schuylkill and Delaware Rivers; 275 MGD; 1.6 million human water quality sensors; 311 call center; “city works” work order system; 10 complaint types; EDAs or event detection algorithms; not temporal like NYC but spatial; which water treatment plant and the day of the week and month of the year; alarm estimation tool; threshold not set in stone and always need to evaluate; mistakes and QA check; work order management system.
11. Calls Taken Here: How a Joint Pilot Project Will Streamline Operational Response for Consumer Water Quality Issues: Janet Grabinski, Dallas Water Utilities and Rex Hesner, CH2MHill: consumer calls surveillance; 9 counties and 6 reservoirs; 2.4 M customers and 24 wholesale customers; \$ 530 M and 1,500 employees; \$ 9.5 M grant from US EPA with 20% local share; 5 sided structure with complaints funneled, filtered, focused; SAP database and algorithm; work order escalation; use social media in addition to calls and emails; within 15 minutes of call, escalation; need to train executives on this program; water treatment plants entrenched in their procedures and resistant to change; use secure FTP (file transfer protocol) site; mapping of complaints to show spatial relation VIP; need a consequence management plan for the contaminant warning system.
12. Advanced Considerations for Control of Hydraulic Transients in Very Long Water Mains: V. Ravisangar, CDM: high and low pressure events = transients; power failure causes pumps to go on and off; pumps variable speed / frequency drives; closing and opening valves linearly is a problem; non-linear closing is the solution as a characterized closure; air valves need surge check units; pumps allowed to backspin to avoid high pressure waves; vacuum protection criteria useful; noise of 100 db at 2 psig differential and 110 db at psig differential.
13. Rehabilitation of Seoul Metropolitan Water Supply System Using a Dry-type Automated Equipment: Seung Chul Choi, Korean Water Resource Corporation: used dry type automated equipment with control of temperature and humidity with specific ventilation equipment; primary and secondary painting with a dual large diameter pipeline, one out and one in.
14. Coordinating a Distribution System for Major Plant Tie-Ins: City of Calgary \$370 M Water Treatment Plant Upgrades: Steven Dodd, City of Calgary Water Resources: 2 water treatment plant upgrades – Bearspaw and Glenmore plants; 1.1 M population; 550ML/D = 150 MGD; construction management/partnership; oil and gas exploration caused major inflation in 2004-2006; flow reversed between plants during shut down.
15. Investigating Potential Impacts of Extreme Weather-Related Events on Water Quality: Jan Routt, Jan Routt & Associates: Kentucky licensed operator for 22 years; Cryptosporidium events weather related.
16. Effective Microbial Control Strategies for Main Breaks and Depressurization: Gregory Kimeyer, HDR Engineering: 35 utilities water main breaks \$ 0.65 M project; boiled water procedures vary; 0.25 breaks/mile/year; 1-2 breaks per day; winter biggest # of breaks; most training is OJT; no checklists; desire AWWA to develop breaks vs new main SOP's and standards.

17. Evaluation of UV-based Technology for Measuring Organic Content of Distribution System Water at Dallas Water: Kenneth Thompson, CH2MHill: TOC, UV, Chlorine, TOC, and conductivity at Dallas Water; TOC is batch 7 minute analysis; UV is pulse lamp several times per minute and will detect most TOC compounds; UV broadband analyzer using 200-750 nanometer spectra; global calibration may not fit your water; SMU grad students with final report June 2012.
18. Philadelphia Water Department ID of Unusual On-Line Water Quality Patterns Using Canary and Data Validation Techniques: Thomas Taggart, Philadelphia Water Department SRA: info is inferential and not fact; may or may not be; change in chlorine demand does not equal heavy metals; inferential algorithms do mean the possible presence of organics.
19. Implement Pilot Results for Early Warning of Drinking Water Contamination Events in the Distribution System: Sander Visser, Optisense B. V. : Vitens Dutch EPA; optical water quality in line tool; ph, TOC, Chlorine; treatment plant easy to monitor; distribution system difficult to monitor; refraction index basis for the instrument; full spectrum of contaminants; detection level at threshold levels up to mg/l levels; biofilms do negatively affect probe and optical sensor; for soluble compounds, not solids; sensor networks, not just one probe; cost: a few thousand Euro's.