



CONFERENCE 2010 ABSTRACTS

TECHNICAL SESSIONS (TS)

TS #1 Canada Wide Strategy for Management of Municipal Wastewater:

Effluent from wastewater systems represents one of the largest sources of pollution, by volume, in Canadian waters. Negative impacts to aquatic ecosystems and to Canadians from harmful substances in wastewater effluent have been documented domestically and internationally for over 20 years. In Canada, the management of wastewater effluent is subject to shared jurisdiction, which has led to inconsistent regulatory regimes and varying levels of treatment across the country.

Through various consultation processes, interested Canadian parties have consistently indicated the need for all levels of government to develop a harmonized approach to managing wastewater. In 2009 the Canadian Council of Ministers of the Environment (CCME) endorsed the Canada-wide Strategy for the Management of Municipal Wastewater Effluent (CCME Strategy). This strategy facilitates the development of a harmonized regulatory framework to manage wastewater effluent in Canada. To implement the CCME Strategy, the federal government committed to develop regulations under the Fisheries Act.

Environment Canada (EC) published proposed Wastewater Systems Effluent Regulations in Canada Gazette, Part I, on March 20, 2010. This was followed by a 60-day comment period. EC is currently in the process of finalizing the Wastewater Systems Effluent Regulations and continuing to work with provinces and territories.

Presented by Amanda Lwanga-Thompson, E.I.T., Environment Canada; Ondiveerapan Thirunavukkarasu (Arasu), P. Eng., Ministry of Environment.

TS #2 On Bringing Central Water to an Existing Town:

The nearly 2,000 residents of the Town of Pilot Butte have been depending on the nearly 700 individual home wells for all their domestic and yard needs. Regulators concerns over potential ground water contamination and the Town's recognition of its potential for expansion led to discussions on a central water system. With federal and provincial cost-sharing funding becoming available in 2009 the Town became serious about central water and retained Bullee Consulting to lead them in that direction. The presentation will explain the funding, regulatory, aquifer factors, design and public relations aspects of the project and will indicate time lines for central water and distribution system installation and residential hook-up.

Presented by Bill Bullee, P.Eng., Bullee Consulting Ltd.

TS #3 Transient and Surge Related Pipe Bursts, Water Loss and Damage Prevention:

This paper will give an overview of transients or surges in a piping network and the resulting pipe bursts which are very common problems. Power or PLC failures, improper valve operation or pumps without adequate control valves cause rapid changes in liquid velocity in a pipeline. This velocity change – released as pressure – can destroy fittings, pipes, valves, instrumentation and pumps. Pressure waves travel the length of the pipeline from the offending device at constant speed until they meet a barrier where they are reflected and then strengthened by incoming waves. This causes transients or surges leading to “pipe burst” or equipment failure. Repair costs, possible litigation for third party damages, plus potentially significant cost of the lost water are extremely expensive. A variety of mitigating solutions that can significantly decrease a system's number and frequency of pipe bursts will be discussed, and a brief explanation of the applications and intricacies of the associated equipment will be outlined.

Presented by Brad Clarke, Singer Valve Inc.

TS #4 The New Wastewater Strategy - The Analytical Perspective (unraveling the mystery):

This session will examine the new testing requirements under the CCME Canada-wide Strategy for the Management of Municipal Wastewater Effluent. New tests that operators have not had to carry out in the past such as carbonaceous BOD and bioassays will be explained. Information will be provided to assist operators with proper sampling and handling techniques to ensure sample integrity is not compromised, followed by a discussion of what the results mean. Also to be discussed are the various reporting and data management options available and questions that all operators should be asking their lab.

Presented by Annette Woodroffe, ALS Laboratory Group.

TS #5 Sequencing Batch Reactors (SBR):

Activated sludge is the most widely used wastewater treatment process around the world. The process was originally developed as a Sequencing Batch Reactor (SBR) in Manchester, UK around 1914 using a “fill and draw”, ie. aerate, settle and discharge reactor. However, the continuous aeration tank-and-clarifier system became more popular and widespread. Then, in the early 1980's when reliable technology was becoming more acceptable, eg. automatic PLC controls systems and valves, SBR's became popular once again. Today, they are recognized as suitable and cost effective treatment for municipal and industrial wastewater, with systems treating populations of 50 to over a million. This paper will discuss types of SBR, process description, operation, performance and equipment. Some examples of plants from small pre-fabricated units to large multi-level stacked systems will be shown.

Presented by Nigel Slater, P.Eng., AWT Technologies Inc.

TS #6 Application of Process Instrumentation in Water/Wastewater Treatment Plants:

Operators and managers today face many challenges. For example:

- Greater urbanization, increased demand for drinking water and increased sewage flow.
- Regulatory mitigation of Combined Sewer Overflows and better storm water management.
- Acquiring data from and monitoring diverse locations.
- Aging of infrastructures.
- High cost to upgrade or replace existing infrastructure.
- Increasing energy costs.

This paper discusses some innovative process control approaches/solutions, along with their benefits, limitations and recent trends that can address those issues, using mainly Canadian case studies and real life examples.

Presented by Vijay Acharya, Siemens AG.

TS #7 Haloacetic Acids (HAA) & THM Formation Potential – Testing Methodology:

The Guideline for Haloacetic Acids (HAA) was added to the “Guidelines for Canadian Drinking Water Quality” in 2008 and the Guideline for THM was lowered a few years ago. HAA and THM may be generated from the chlorination of water in drinking water supplies. HAA & THM Formation Potential tests provide valuable information to assess the formation potential of source waters and to evaluate the various processes used to optimize treatment systems before chlorination. The methodology and some typical experimental scenarios will be presented. Data from tests performed on several unnamed provincial water systems will be discussed.

Presented by Dr. Wo Yuen, Saskatchewan Research Council.

TS #8 Wastewater Disinfection Methods:

Under certain regulated circumstances, a municipality's wastewater must be disinfected prior to discharge. There are a number of options to accomplish this, such as chlorination and ultra-violet radiation. This paper will explain the reasons for wastewater disinfection, will explain a number of disinfection options and will describe the disinfection method of choice.

Presented by Tibor Takach, P.Eng., KGS Group.

TS #9 Optimizing Nutrient Removal Through Instrumentation:

Proponents of Nutrient Removal indicated that on-line instrumentation is critical to operating & optimizing a nutrient removal system.

However one must research questions such as: what instrumentation provides best value; what will the information mean; and what measurements should be done in a lab. Unfortunately, research has revealed the lack of topical information with no centralized reference material.

The goal of this paper is to introduce a reference guide to assist in making instrumentation decisions. It will make recommendations of on-line instrumentation and lab testing to monitor and optimize nutrient removal facilities from the "Minimum Category", to "Medium Transparency" and "Maximum Performance Category". The information is based on four different nutrient removal processes (Modified Ludzak-Ettinger, Four/Five Stage Bardenpho & Three Stage Phoredox).

Presented by Duncan Hoyle and Bob Dabkowski, Hach Company

TS #10 Lagoon Optimization:

Wastewater facultative lagoons can be an effective way of treating municipal wastewater. This paper will discuss methods an operator can use to get the best performance from his/her community lagoon system.

Presented by Martin Hildebrand, P.Eng., Nelson Environmental.

TS #11 Is Your Drinking Water Safe?

Water treatment strives to ensure that drinking water is always clean and free of contaminants to ensure proper health and wellness. Routine inspection of drinking water facilities is critical to determine the levels of sediment and by-product that may exist, especially in settling basins, quiescent zones and reservoirs as a result of the treatment process. It is also crucial for the operator to realize the structural integrity of the water reservoir.

This paper will outline actions that an operator can take to effectively recognize problems with the potable water tank. In addition, this paper explains how on-line robotic inspection and cleaning of potable water tanks assist in maintaining drinking water systems and drinking water quality, and how a real time video recording of the process can assure the cleaning was performed to the owner's satisfaction.

Presented by Trevor Klock, Scantron Robotics Inc

WORKSHOPS (WS)

WS #1 Regulations, Permits to Operate & Operator Certification:

Saskatchewan is adopting a new, results-based model for environmental regulation that will improve protection of the environment, while promoting innovative new tools in environmental management. The current regulatory regime was developed in the early to mid-1970's and consisted almost entirely of prescriptive legislation and regulations that directed agency inspections and enforcement when contraventions were identified.

The Ministry of Environment (MOE) regulates drinking water and wastewater at nearly all of Saskatchewan's villages, towns and cities. To accomplish efficient and safe regulation of water and sewer, MOE's Environmental Protection and Audit Division contains the Municipal Branch which has two main sections: the Environmental Protection Services Section that reviews plans and projects to issue one-time Permits to Construct, and the Environmental Services Section which issues ongoing Permits to Operate water and sewer works.

In the area of operator certification there has been a request by the federal government for an Agreement in Trade within the Labour Mobility Act. The Canadian Water and Wastewater Operator Certification Committee has been working with the Association of Boards of Certification to develop the Canadian Best Practices which will form the bases for reciprocity between the provinces and territories. These practices will be outlined and changes addressed within this presentation. Present requirements will also be discussed.

The presentation will explain organization, legislation, permitting requirements, guidelines and timelines for the regulation of construction and operation and certification of drinking water works and wastewater works in the province of Saskatchewan.

Presented by Frank Reid, P.Eng., Gary Papic and Rod Broadfoot, Ministry of Environment.

WS #2 SCADA Solutions Enhance Productivity of Water Utilities:

Efficient monitoring of even a well-developed water distribution network with good operating practices has long been a challenge for management. Improper system management might result in problems such as, increased costs, insufficient water, inconvenience, unsatisfied customers, and excessive or misuse of water and more. To minimize these problems water utilities must improve their system operation based on real time data communicated to a control center. Supervisory Control and Data Acquisition (SCADA) solutions as an integrated part of utility-wide water management program may significantly improve the system effectiveness. Key workshop topics include:

- Remote plant monitoring and control,
- Monitoring pump conditions and performing operation sequences,
- Flow monitoring,
- Residential Automated Meter Reading (AMR),
- Monitoring water supply assets,
- Implementing a SCADA control center,
- Design and implementation of a secure SCADA-Data communication system, including Remote Terminal Units, Programmable Logic Controllers and Intelligent Electronic Devices

Participants will obtain the basic knowledge to specify the SCADA requirements for their utility. All will be offered the opportunity to consult with the presenter via email with questions regarding SCADA solutions for their utility.

Presented by Dan Ehrenreich, Motorola Israel Ltd.

WS #3 Industrial Electrical Safety for Non-Electrical Workers:

Seventy-nine percent of electrical-related workplace fatalities in the past decade have involved non-electrical workers. This workshop will help operators understand electrical hazards, assess their risk and control exposure to hazards. It will explain basic electrical theory, help to understand electrical codes, standards and hazards, and include effects of electricity on the human body. Potentially hazardous electrical tools, equipment and locations will be explained so one can identify dangerous situations. Safe work practices, electrical emergencies, rescue, and role of first aid will be discussed.

Presented by Magna Electric Corporation.

WS #4 Fundamentals of Calibration and Certification of On Line and Lab Instruments in Water & Wastewater:

This workshop will give an overview of the theory of operation of water analysis instrumentation. It will give a review of calibration and certification practices and will explain best practices for calibration and certification. Finally, calibration procedures for on line and lab instruments will be explained.

Presented by Andre Lemoine, ClearTech.

WS #5 Couplings, Service Saddles, Tapping Sleeves (Wet & Dry) and Repair Clamps:

This workshop will explain the different types of such devices; where, why and how they are used in a distribution and collection system. It will discuss their components, what they are made of; the types, sizes of pipes and the material the pipes are made of on which they are used; and how to install, pressure test and back-fill, once the devices are correctly installed. The slide presentation will be supported a variety of examples of these devices.

Presented by Dave Brewer, Robar Industries Ltd.

WS #6 Blowers, Air Compressors and Air Dryers:

This workshop will explain the differences between blowers and air compressors and where each can be used to best advantage. It will explain types of blowers and compressors describing particular applications, limitations and benefits. Also explained will be preventative maintenance and troubleshooting for modern blowers, compressors and dryers. A comparison will be made between using Original Manufacturer Equipment (OME) vs. Aftermarket Equipment. The purpose of air drying, either via a desiccant or a refrigerant will be explained as each may pertain to a particular air use in a facility.

Presented by Mike Gregorash, Comairco Equipment.