2012 ISA Water/Wastewater and Automatic Controls Symposium

Holiday Inn Castle Resort……Orlando, Florida, USA......**Aug 7-9, 2012**
Sponsored by the ISA Water/Wastewater Industries Division – *www.isawwsymposium.com*

Some Possible Presentation, Paper and Poster Ideas

Plant Case Studies

➢ Plant Upgrades: Opportunities, ROI, Pay Back Periods, and Cost Savings

➢ New Facilities: Overview of Technologies Used in a New Facilities

➢ Control System Upgrades: Highlights, Photos and Lessons Learned

➢ Control System Replacements: Highlights, Photos and Lessons Learned

➢ Implementing industrial networks for instrumentation in a water plant

➢ Talking to Old-Timers: Lessons from a Seasoned Operator

➢ Lessons Learned from the Plant

Instrumentation

➢ New Analyzer Technologies and Applications

➢ Using Instrumentation to Save Money in Operations

➢ Auto-samplers, process analyzers, and advanced instrumentation

➢ Opportunities for Dissolved Solids Analyzers in Wastewater Plants

➢ The Art and Science of Sludge Blanket Interface Analyzers in wastewater plants

➢ A comparison of Dissolved Oxygen Probe and Analyzer Technologies

➢ Applications for Radar-based Level Instrumentation in water and wastewater plants

➢ From the paddle wheel to Coriolis: An overview of flow measuring technologies

➢ Weirs, Plumes and Channels: An older but reliable flow measuring technology

➢ A comparison of level transmitter technologies used in water plants

➢ Strategies for Deploying Redundant Instrumentation

➢ Level Measurement in Challenging Environments: Sludge Digesters

➢ Using instrumentation for effective chlorination control

➢ How to use air blasts, wipers and flushing systems to reduce maintenance costs

Control System Design

➢ Techniques for Automating Existing Plants

➢ Centralized vs. Distributed Control – Considerations when doing software design

➢ Who Drives the Bus? Coordinating Control Between Different Unit Controllers in a Wastewater plant

➢ The decision to automate vs. semi-automate: When does it make sense

➢ Managing Control System Complexity

➢ Control System Redundancy and Robust Design

➢ PLCs, RTUs, and DCS: Are they really that different anymore?

➢ Moving from DCS-based control to PLC-based control: Challenges and Opportunities

➢ Moving from PLC-based control to DCS-based control: Challenges and Opportunities

➢ Hardwired Interlocks for pumps and valves: Best Practices

➢ Hybrid Control Systems: How to identify them and when to use them

➢ Vendor-provided Control Systems: Dealing with Delegated Control without going Crazy

➢ Techniques for segmenting control system networks to prevent congestion and latency problems

➢ New Trends and Techniques in Control System Design

➢ What does the color red mean? The motivations and use of color for buttons, pilot lights and status indicators

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Project Management

➢ How System Integration Projects are Different
➢ Capturing and Evaluating Stakeholder Wants/Needs for SCADA Projects
➢ Lessons learned from scheduling/staging a control system replacement at an operating plant
➢ How to Hire and Manage a System Integrator
➢ Effective Tendering Techniques for System Integrators
➢ The Start-up Schedule: Lessons from the Field
➢ Sole Source and Performance-Based Bidding: A comparison of system integrator hiring methods
➢ Strategies when doing System Integration as a subcontractor
➢ Wiring Instrumentation Specifications for Vendors to Bid On – Important Aspects to Consider
➢ Tips for working with Multiple System Integrators on Large Projects
➢ Managing the System Integrator and Process Consulting Firm Relationship
➢ The Role of the System Integrator on Large Projects

System Integration

➢ The Process Control Narrative – How to develop and use it
➢ Why the P&ID is your best friend
➢ How ISA Standards can help with system integration projects
➢ Dos and Don'ts for Control System Standardization
➢ System Integration Lessons from the Field
➢ When to start Programming: It's not as easy as it seems
➢ How to Avoid Getting Squeezed: Tips for working with other contractors and trades on the construction site
➢ The Trials and Tribulations of Interfacing with Vendor-provided control systems
➢ How to Effectively Specify Interfaces for Vendor-provided control systems
➢ Common System Integration Gotchas and Pitfalls, and how to avoid them
➢ Ladder Logic, Function Block, Structured Text, Instruction List and SFCs: How to Choose which Programming Technique to Use

Pumps, Valves, Blowers and other Final Control Elements

➢ An overview of how valves are sized
➢ Common techniques for controlling valves from a system integrator perspective
➢ Key characteristics to look for when specifying and integrating VFDs
➢ Common I/O interfaces for motor controllers, blowers and fans
➢ Gotchas for pre-packaged motor control circuits, and the integration challenges they can present
➢ Best Practices for the control of standby generators and automatic transfer switches
➢ Power outages, UPSs, and standby generators: Best Practices for handling power outages and automatic plant re-starts
➢ Effective surge protection for equipment, instrumentation and field wiring: Best Practices

Field Wiring / Instrumentation Networks

➢ Addressing misconceptions about Wired vs. Industrial Network connection methods
➢ Industrial Networks and the 4-20mA Loop: A Comparison of Connection Methods
➢ An overview of Profibus and Fieldbus
➢ An overview of the 4-20mA HART communication protocol
➢ A comparison between different industrial network technologies
➢ Specifying Wire Colours: How to Develop a workable facility standard
➢ How to effectively specify field wiring: available wire types vs. applications
➢ Using Intrinsically Safe Relays (ISRs) for Classified Environments: Best Practices
➢ Failsafe vs. Normally Open: When failsafe wiring makes sense and the potential drawbacks

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Wireless Technologies

➢ An Overview of the ISA100 Wireless Instrumentation Standard

➢ A Comparison between ISA100 and WirelessHART: Are they really that different?

➢ Opportunities for wireless instrumentation in SCADA networks

➢ A case study on using wireless instrumentation in a water plant

➢ Using wireless sensors on a moving bridge on an aeration cell: a case study

➢ Implementing redundancy in wireless networks

➢ Ultra-low-power wireless: A new technology with new opportunities

➢ Techniques for powering wireless instrumentation: There are more options than batteries

SCADA Networks

➢ SCADA Network Design: Best Practices and Lessons Learned

➢ SCADA Network Design and Redundancy Options

➢ A comparison of long-range SCADA network technologies

➢ Leased Line & Cellular Technologies Application Notes

➢ Remote locations and minimal infrastructure: opportunities for low power radios and instrumentation

➢ Considerations when deploying solar-powered out stations

➢ Implementation of a Mesh Radio SCADA Networks

➢ Separating SCADA networks to avoid network congestion and bandwidth issues

➢ Best practices for deploying Ethernet-based fiber optic networks

➢ The role of the RTU in SCADA Networks

Start-up / Commissioning

➢ Managing the Start-up Schedule: Tips on this Art Form

➢ Tips for Successful Start-ups

➢ Effective Loop Checks (and the other activities that go with them)

➢ Using Factory Acceptance Tests (FATs) to cut down on-site commissioning time: A comparison of techniques

➢ What to test formally: Tips for writing effective Site Acceptance Tests (SATs)

➢ Start-up: Informal Automation System Tests that Every System Integrator should do

➢ Surviving the Start-up from Hell: Lessons from the Field

➢ So you've inherited the Start-up from Hell: Where do you start?

➢ Common problems and solutions when commissioning VFDs (variable frequency drives)

➢ Using Check Sheets, Test Outlines, and Documentation to help you during start-up

Automation Strategy

➢ Finding and Communicating the ROI of Automation Investments

➢ Purchasing Automation Hardware/Software in Public Utilities – Making the Purchasing Department Your Ally and not your Foe

➢ Leveraging GIS as part of the Automation System

➢ Implementing Workable Revision Control Solutions for PLC, HMI, and SCADA system Code

➢ Disaster Recovery Planning from an Automation Perspective

➢ Control System Failure Survival Strategies

➢ Automated Start-up vs. Manual Start-up Procedures: Doing an Analysis based on ROI and Risk

➢ Using Automation to Realize Gains in Energy Efficiency

➢ Electrical sub-metering, power analyzers, and the role of SCADA

➢ How to set up an effective calibration program to save time and money

➢ The economic argument for automating small wastewater plants

Wastewater Automation

➢ Cost effective redundant backup control strategies for sewage pumping stations
➢ Real-time control of equalization tanks to prevent bypass events
➢ Using Automation to Proactively Handle Rain Events
➢ Automating distribution box outlet gates for splitting flow between process trains in real-time
➢ Automated Control of Decanting: A comparison of batch-based and continuous approaches
➢ Aeration Blower Control for Wastewater Plants: A Comparison of Control Strategies
➢ Techniques for Automating Grit Removal, Bar Screens, and Cyclones
➢ Automated Control Strategies for UV Disinfection
➢ Process Optimization in the Wastewater Plant
➢ How to Reduce Wastewater Plant Energy Costs using SCADA

Water Automation

➢ Advantages of monitoring pressures and flows in distribution networks
➢ New control strategies for booster pumping stations
➢ Using Automation to Control Multiple Water Towers in a Pressure District
➢ Automation Challenges for Small Water Systems
➢ Techniques for maintaining chlorination in large water networks
➢ Effective strategies for automating the backwashing for filters
➢ Control Strategies to minimize water aging in water towers
➢ Effective pH control: instrumentation and dosing techniques
➢ Instrumentation/Analyzer challenges when moving from Chlorine to Chloramine-based Secondary Disinfection
➢ Mechanical control valves vs. PLC-driven control valves: Benefits and Drawbacks of each
➢ VFDs verses Pump Control Valves: How to realize energy and maintenance savings while reducing costs
➢ Process Optimization in the Water Plant
➢ The Lights are on but no one is home: Automation Techniques for un-manned stations

Leveraging SCADA

➢ Intelligent and Expert Systems
➢ Process Modelling in the Automation System
➢ Tracking Energy Usage Using SCADA
➢ Load Balancing, Tuning and Optimization using Automation Tools
➢ PID Tuning Techniques for very large and slow processes
➢ Model-based alarming for regulatory compliance
➢ Key Performance Indicators and Dashboards in water plants
➢ Process Tracking and Optimization using SCADA
➢ The power of the DCS when it comes to plant optimization and tracking
➢ The convergence of the PLC and DCS Technologies in Automation Systems

Operations & Maintenance

➢ Using Automation to increase operator effectiveness
➢ Using Automation to Help Solve Staffing Challenges
➢ Tying Automation Systems into the Maintenance Management System
➢ Enterprise Integration and ISA95
➢ How to implement Revision Control for PLC, HMI and Configuration Management Across the Enterprise
➢ SCADA and the Current Regulatory Environment
➢ How to talk to operators: Finding out how automation can make their jobs easier
➢ Workflow support software and computerized log books

Data Management

➢ Data logging, retention, and redundancy: Lessons from the field

➢ Strategies for Managing Very Large Process Data Sets

➢ Techniques for logging process data, alarms, alerts and events

➢ Leveraging OPC for automation and data logging

➢ Databases, Historians and Files: How to avoid information overload

➢ Backup strategies for process data

➢ Managing data redundancy in a strict regulatory environment

➢ The challenge of managing process data across an entire water district

Data Presentation & Reporting

➢ Designing Effective Trend Screens

➢ Getting the data out: Tips on how to get usable process data into people's hands

➢ SCADA Reporting: Tips on Trying to Figure out what Users Want/Need

➢ Data Reporting/Presentation Techniques and Strategies

➢ Moving Away from Excel-based Reporting to Intelligent Reporting Platforms

➢ Ad-Hock Reporting: It is feasible to implement and here's how to do it

➢ So much data and so little time: How to visualize key process data

➢ How to Effectively filter data to avoid misconceptions from equipment that is offline

HMI Design and Implementation

➢ HMI Design for Operator Effectiveness

➢ Techniques for Designing whole-system overview screens

➢ Evaluating the Use Cases for HMIs: Normal Operation and Abnormal Situations

➢ Situational Awareness: Keeping Operators in the know in multi-facility control rooms

➢ Effective Use of Multiple HMI Screens

➢ Human Factors and Control Room Design

➢ Everyone uses HMIs Differently: Techniques for Developing HMIs for everyone

➢ How Many HMI Screens are enough? Providing Operators with the Tools they Need

➢ Maintaining SCADA Systems with Hundreds of Screens in the face of changing LCD resolutions

➢ Sneak Preview of the Upcoming ISA101 HMI Standard and other existing HMI standards

➢ The Use of Colors on HMI Screens: An Ongoing Debate

➢ How to design a really bad HMI, and how we can learn from it

SCADA Security

➢ An Overview of ISA99: Security for Automation Networks

➢ SCADA Security Incidents in the past year: Lessons from the Wild

➢ Evaluating SCADA Security Risks

➢ VPNs, Remote Access, and Managing Security Risks

➢ Security and Usability: They are not opposites

➢ Recovering from an Intrusion: Do you have a contingency plan?

➢ How to Segment your Automation Network for Improved Security

➢ Selecting a Firewall: What to look for

➢ A Case Study on how to secure your SCADA network

➢ Commons Risks to SCADA Systems, and what to do about it

➢ Beyond Stuxnet: Looking for the next Control System Threat

Human Factors

➢ People watching: What we can learn by observing people in a control room

➢ Designing an effective Operations Centre and Control Room

➢ Effective Placement of HMI Screens

➢ Managing Complexity on the HMI Screen

➢ Designing Control Interfaces that can be used by both younger/older and novice/experienced operators

➢ Common Techniques for representing complex processes using simple HMI screens

➢ How to Win Friends and Influence People: Introducing new SCADA systems to experienced operators

➢ Identifying the non-obvious users and stakeholders of the Automation System and what they need

Alarm Management

➢ An overview of ISA18.2 Alarm Management standard in the context of water/wastewater

➢ Why water/wastewater is so bad at alarm management: and what we can do about it

➢ How to integrate Alarm Management concepts into the plant design process

➢ How to integrate Alarm Management concepts into plant operations

➢ Techniques for Reducing Nuisance Alarms

➢ Common Nuisance Alarming Mistakes

➢ What is an official Alarm Rationalization Process: An argument based on Benefits vs. Resources Required

➢ Addressing Alarming Problems: Low Hanging Fruit that can offer immediate improvements

➢ What is an Alarm Flood?: Why you should take action, when, and how to do it

➢ What are these alarms for anyway? Selecting and Applying Alarms that make sense to operators

➢ Just Because you Can, Maybe you shouldn't: The art of removing unnecessary alarms

➢ What Accident Reports from other Industries can teach us about alarming

➢ Tips for using alarms to help, rather than hinder, operators

➢ When an "alarm" is not an alarm: Using Alerts and Events

➢ Alarm Management Lessons Learned from Other Industries and how we can use them

➢ A case study in reducing nuisance alarms and the benefits realized

➢ Call-out Alarm Strategies and Techniques

➢ Call-out Alarm Rationalization techniques, and evaluating potential cost savings

➢ Alarm Rationalization at a Wastewater Plant: A Case Study

➢ Using model-based alarming to meet complex regulatory requirements

➢ Alarm Routing: Routing Alarm Messages to the Groups who Need them

➢ Use Smartphones, Tablets and Pagers for improved alarm response