Setting the Standard for Automation™

Water/Wastewater Industry Division

Calendar of WWID Events

Jun 9-12, 2012	**Spring Leaders Meeting** San Diego, California, USA
Aug 7-9, 2012	**7th Annual WWAC Symposium** Orlando, Florida, USA
Sept 22-23, 2012	**Fall Leaders Meeting** Orlando, Florida
Sept 24-27, 2012	**ISA Automation Week** Orlando, Florida

In this Issue

Fall 2011 Newsletter

Director's Welcome

As 2011 winds down, the Water/Wastewater Industries Division is hard at work planning for a great 2012. We've added to our leadership team, revitalized our newsletter, and laid the groundwork for some exciting developments.

I would like to welcome two new leaders to our board. Kevin Patel (patelkn@cdm.com) is our new Membership Chair and Pavol Segedy (psegedy@nc.rr.com) is our new Section-Division Liaison. Please join me in welcoming them and thanking them for their time.

Our Director-elect and Newsletter Editor, Graham Nasby, has been hard at work revitalizing our Division Newsletter. Our Summer 2011 release contained 26 pages of great technical content, news and information. It can be viewed/downloaded on the Division web page (www.isa.org/wwid).

Planning is well underway for our 2012 symposium. We'll be launching a new dedicated web site in the coming weeks, which will host content from last year's event and information about the upcoming program. We'll also be offering a series of free webinars leading up to the symposium, which is scheduled for Aug 7-9, 2012 in Orlando, Florida, USA.

Finally, I'd like to invite you to stay engaged with our Division and remind you to join our LinkedIn Group (http://www.linkedin.com/groups/ISA-Water-Wastewater-Industries-Division-2031271) where you can ask questions and offer answers to your peers.

Jon DiPietro
WWID Division Director

Newsletter Editor's Welcome

Welcome to the fall 2011 edition of the ISA water/wastewater division newsletter. We have a jam-packed newsletter that I hope you will enjoy reading. Our newsletter starts information on our 2012 student scholarship program, a planning update for our 2012 symposium, and a feature interview with long-time member Wally Ingham. This is followed by an article about the automation of a new waterworks facility in Thunder Bay, an introduction to two of our new executive committee members, and a technical article about how to mitigate fluid surges from pumps. The newsletter concludes with a technical paper about system integration lessons learned.

The entire WWID executive committee and I are excited about our upcoming 2012 Water/Wastewater and Automatic Controls Symposium that is scheduled for August 7-9, 2012. More information about the symposium can be found in my symposium update column. This will be the must-attend event in 2012 for the water/wastewater automation professional!

Graham Nasby
WWID Newsletter Editor

Message from your Director-Elect

For the last several months I have been involved in a start-up at a recently upgraded municipal wastewater plant. I personally like start-ups – it's the time when you are at the top of your game, and every day brings new puzzles that you and your team work through. It's also a team effort and it's a time when you get to draw on everyone's individual strengths. You're starting up equipment for the first time, and it is the moment when all the hard work that went into the plant design and construction starts to come to fruition. It is also a time where the knowledge-sharing and networking that I get through ISA WWID membership is vital.

Every project brings new experiences, and the more we can share these experiences with the others, the better we can all be at our jobs. It is simply impossible for any one person to know everything. Many of the best ideas and techniques I use during the course of the day have been as a result of talking with other professionals in my field. This is where WWID membership comes in very handy. Get on the WWID email mailing list, join our LinkedIn group, read the newsletter, and come to our annual symposium. Most importantly: talk to people. By networking and sharing experiences, we all continue to learn and get better at our jobs.

In the spirit of sharing technical knowledge, I have been working on a pet project of mine for the last several months. Our WWAC Symposium started in 2003 and has been an annual event since 2007, but we have been doing a poor job of sharing the papers/presentations from these past symposia. In fact prior to this year, only the papers for the 2003 symposium were available to WWID members. My goal for 2012-2013 is to track down all of these past papers/presentations, and make them available for both the WWID membership and the automation community at large.

I will be working closely with both ISA staff members and volunteer leaders so that we can make these papers available via the www.isa.org website and through our own WWID website at www.isa.org/wwid/. In particular, I would like to thank ISA staff members Susan Colwell (Manager, ISA Publications Department) and Rodney Jones (Senior Administrator for ISA Technical Divisions) for their help and support so far on this project.

As the first stage of this project, I am pleased to announce that the 2011 WWAC papers/presentations are now available for download at www.isa.org/wwid/ under "Past WWAC Papers".

I encourage you to read in this newsletter about our upcoming 2012 WWAC Symposium that is scheduled for Aug 7-9, 2012 in Orlando, Florida. I also encourage you to submit an abstract for our upcoming call for papers. I hope to see you there!

Graham Nasby, P.Eng., PMP
WWID Director-elect &
General Symposium Chair for the 2012 WWAC Symposium

Upcoming Events

We are pleased to announce that our 2012 WWAC Symposium will be taking place August 7-9, 2012 in Orlando, Florida, USA. Hotel arrangements are currently being finalized and will be announced shortly. We will also be launching our new 2012 symposium website at www.isa.org/wwac in the next few weeks. The **Call for Papers** for the symposium will be released on the new website as well.

The August timeslot has been chosen so that we don't conflict with the major AWWA and WEF conferences. Keep in mind the ISA WWAC Symposium is the only conference that is focused solely on instrumentation, automation, and SCADA in the water/ wastewater sector. We look forward to seeing you in 2012!

- ACE12: American Water Works Association (AWWA)
  June 10-14, 2012 – Dallas, Texas
- **7th Annual ISA Water/Wastewater Symposium**
  August 7-9, 2012 - Orlando, Florida, USA
- WEFTEC 2012: Water Environment Federation (WEF)
  Sept 29 – Oct 3, 2012 – New Orleans, Louisiana

SAVE THE DATE

7th ISA Water & Wastewater and Automatic Controls Symposium

August 7-9, 2012

Tuesday - Thursday

Orlando, Florida, USA
(with Disney World just around the corner)

2 full days of speakers/presentations
Track 1 – Instrumentation, System Integration, Automation, Plant Case Studies, New Technologies, Optimization
Track 2 – SCADA, HMI, Human Factors, Alarm Management

1 full day ISA Training Course

Plant Tour of a local Water/Wastewater Facility

Trade Show, Reception & Networking Event

Affordable Professional Development for
Plant Operations/Maintenance Staff, Plant Managers, Plant Designers, Engineers, System Integrators

CEUs – Continuing/College Education Units
PDHs – Professional Development Hours

Announcing the 2012 WWID Student Scholarship Program

By Michael Fedenyszen, WWID Scholarship Chair

The ISA Water/Wastewater Division is pleased to announce that the 2012 WWID Student Scholarship program is now accepting applications**. Applications are due January 31, 2012** and must be sent by postal mail to the Scholarship Chair.

The ISA's WWID is committed to encouraging youth into higher education by offering two one thousand dollar ($1000.00 USD) scholarships to qualifying candidates. The winners will be selected by a lottery of chance in February of 2012. All eligible candidates and their application forms will be reviewed by the Scholarship Chairman before the drawing and must meet the following requirements.

1. Applicant must be a WWID member, have a parent who is an ISA WWID active member, or be an ISA WWID Student member. The member must be in good standing with the ISA WWID (i.e., dues paid to date).

2. The candidate must be enrolled as a full-time student in the spring semester at a two or four year institute of higher learning and he/she must have completed the previous semester as a full-time student.

3. To be considered for the ISA WWID Scholarship Award, the application form must be filled out completely and mailed to:

Michael B. Fedenyszen
2012 ISA WWID Scholarship Chair
60 Whittier Street
Haverhill, MA 01830
USA

4. Application forms must be received by the WWID Scholarship Chairman no later than January 31, 2012.

For more information applicants are referred to the "WWID 2012 Scholarship Program Details and Applicant Rules" and "WWID 2012 SCHOLARSHIP APPLICATION." Copies are attached to this newsletter.

Visit us at www.isa.org/wwid for additional information regarding the Water and Wastewater Industries Division and its scholarship program.

Water/Wastewater Industry Division

2011 Student Scholarship Winners

Last year's student winners

The ISA Water/Wastewater Division is pleased to announce the winners of the 2011 WWID Student Scholarships. They are as follows:

Torry Brashear

University of Nevada
Reno, Nevada, USA

Torry is a second year student at the University of Nevada in Reno, Nevada, USA. He sent us the following note:

"I would really like to thank the ISA WWID for selecting me for this very generous scholarship. This will definitely help in paying for my tuition this semester.

I am a junior at the University of Nevada, Reno, studying mechanical engineering. I am an eagle scout and recently participated in a high adventure 60 mile, 6 day canoeing trip in Canada. My hobby is 3D animation."

Richard Germade

Rensselaer Polytechnic Institute
Troy, New York State, USA

Richard is currently completing his M.Sc. in Environmental Engineering at Rensselaer Polytechnic Institute. He also has interests in psychology and geology/hydrogeology, and looks forward to taking coursework in these areas as time allows. He is thankful for the support given to him by the WWID scholarship.

The annual WWID student scholarship is one of the key services that the Water/Wastewater Division provides for the automation community. Headed up by our scholarship chairman Michael Fedenyszen, from the Power Group at Vanderweil Engineers LLP, the goal of the program is to inspire and support promising young scholars. We extend our congratulations to our 2011 WWID student scholarship winners!

2012 WWAC Symposium
Dates Announced & Planning Update
By Graham Nasby, 2012 WWAC Symposium Chair

The committee and I have been hard at work during the last several months laying the groundwork for our 2012 WWAC Symposium. This has meant countless hours of planning associated with the symposium's business plan, budget, marketing and most importantly technical content. We now have a confirmed date for the symposium – it will be held on **August 7-9, 2012 in Orlando, Florida, USA.**

These symposium dates have chosen for several reasons. The first is that it is a Tues-Wed-Thurs timeslot. This allows maximum flexibility for attendees that want to bring their families. The mid-week timing allows families to easily attend the theme parks in the Orlando area before and after, as well as during the symposium. In case I didn't mention it already, Walt Disney World is right next door to the hotel we are considering!

The second reason for the August timeslot is so that it does not conflict with the major AWWA and WEF conferences. ACE is typically held in June and WEFTEC takes place in early October. We realize that many people like to attend both shows, so we have set our schedule accordingly.

The third reason is that August is an inexpensive time of year to travel to Orlando both in terms of airline flights and hotel rooms. For those of you who work for public utilities, we know that every dollar counts. We are working to keep costs down for you!

As I write, the hotel arrangements for this year's symposium are being finalized. I expect to be making our hotel announcement shortly.

Once we have the hotel finalized, the program committee and I will be announcing the **Call for Papers** for this year's symposium. The Call for Papers will provide 3 ways for you to present your work: there is the traditional 35 minute PowerPoint presentation, a 35-minute PowerPoint Presentation accompanied by a 8-12 page paper, and (new this year!) a large format poster. More details can be found on the upcoming Call for Papers.

The other part of the symposium that I am excited about is our upcoming 2012 Symposium website. Spearheaded by our marketing chair Jon DiPietro, the website will be a spring board for information about the conference, the call for papers, keynote/plenary speakers, and other events associated with the symposium. Additional website features will include interviews with key symposium partners, videos of past symposium presentations, and sample papers/presentations to make it easier for employers to see the symposium's value

We have exciting things planned for this year's symposium, and I look forward to sharing the details with you as the planning for this year's event takes shape.

Yours very truly,
Graham Nasby
2012 WWAC Symposium – General Symposium Chair
Phone: (519) 763-7774 ~ Eastern Time Zone
Email: graham.nasby@eramosa.com

2012 WWAC Symposium
Introducing the Symposium & Program Committees
By Graham Nasby, 2012 WWAC Symposium Chair

I am pleased to announce the following members of the 2012 WWAC Symposium organizing and program committees:

Symposium Organizing Committee
- Graham Nasby, Eramosa Engineering (Chair)
- Jon DiPietro, Bridgesoft LLC (Marketing & Website)
- Dave Hobart (Vendor Relations Chair)
- Pavol Segedy, Brown & Caldwell (ISA Section Liaison)
- Michael Fedenyszen, Vanderweil Engineers (Awards)
- Rodney Jones (ISA Staff Contact)

Symposium Program Committee
- Joe Provenzano, PEMCO (Program Chair)
- Richard Birdsell, Orange County Sanitation District
- Jon DiPietro, Bridgesoft LLC
- Cameron Kamrani, Kamrani Engineering
- Graham Nasby, Eramosa Engineering
- Kevin Patel, CDM
- Matt Phillips, City of Guelph Water Services Dept.
- Steve Valdez, GE

We will be announcing the individuals who will be acting as our official AWWA and WEF liaisons for the committee shortly.

Q&A Spotlight Interview
with Wally Ingham

Wally Ingham has been a member of the ISA and water/wastewater industry division (WWID) for over 30 years. He has held various roles in the society, including being an active member of the WWID executive. Wally currently holds the position of Senior Electrical / Instrumentation Engineer at Stantec's Edmonton office and is a licensed professional engineer in the province of Alberta, Canada. Wally has kindly agreed to share his insights into the water/wastewater sector and ISA membership in this month's WWID newsletter's Q&A Spotlight.

WWID: Can you tell us a little about yourself?

Ingham: I started my career at Westinghouse Canada in Hamilton Ontario in 1965. I was hired on to work in the military electronics division but when I showed up for work the first day I was told the division was shutting down, my first layoff. Fortunately a new division called "systems division" was starting up and I got hired on with it. This new division of Westinghouse Canada specialized in large industry such as steel mills, paper mills, and mining. Once an order was received we would design the plant and issue the purchase orders for motors, transformers and switchgear to the other Westinghouse divisions, but we would keep the detailed controls and instrument design and fabrication in house within our division.

Back then the term "controls" meant mechanical relays, mag-amps and vacuum tube NOR logic. Instrumentation was still firmly entrenched in its pneumatic roots.

My internship at Westinghouse consisted of plant floor assembly, wiring, and testing of control panels. This was soon accompanied by additional responsibilities for field installation and commissioning. Following the meltdown closure of Westinghouse Electric and the subsequent closure of Westinghouse Canada in the late 1960s, I joined Fisher & Porter Instruments where my control panel design skills were in demand. At the time instrumentation/controls had just started making its transition from mechanical relay logic to transistorized units.

After 2 years at F&P I left and joined a private consulting firm in Edmonton, Alberta which specialized in electrical and instrumentation services for the oil patch. As there were very few people in water/wastewater with instrumentation and controls experience in Edmonton area, the local F&P sales reps promoted my experience to other consulting firms and the business grew. The private firm I was with prospered and soon merged with Stantec to create a business unit dedicated to the water/wastewater sector and various other specialized projects.

WWID: What do you like most about working in water/wastewater?

Ingham: In my case I do design for the electrical, building services, and instrumentation aspects of projects, as well as looking after the design and selection of SCADA system hardware and communications networks. At the end of a project when it is finally operating and the client is happy, it doesn't matter if its water, wastewater or any other industry, it's the satisfaction from doing a job well that I enjoy most.

WWID: Are there any notable/interesting projects that you worked on, which you would like to share with us?

Ingham: I have been fortunate to have had the chance to work on projects throughout North America and in several places around the world. My work in Canada has taken me as far north as Inuvik in the North West Territories and as far east as Newfoundland, along with a many stops in between. I have worked on several projects in the USA and monitored infrastructure projects in China for the World Bank.

With my background in electrical, instrumentation and controls, there are numerous interesting projects that come to mind, but the one that stands out for me is working on the Straits Crossing Bridge between Prince Edward Inland and New Brunswick. I did the electrical power, lighting and grounding design for the 13 kilometer long bridge.

WWID: How did you first get involved with the ISA?

Ingham: One of the instrument reps I work with was recruiting new members for the Edmonton Section and talked me into signing up as a senior member. Since I was doing work in the water/wastewater sector, I naturally joined the ISA's water/wastewater division when I got my ISA membership.

WWID: How has the ISA membership, and membership in the water/wastewater division in particular, proved beneficial to your career over the years?

Ingham: I would say that the benefits are many but they are indirect. As a senior engineer I was allowed to attend one major trade show or symposium a year so I chose the ISA Automation Week (formerly known as ISA Expo) which proved to keep me up-to-date and more current on products than others in the company.

At one ISA Expo I stumbled across the ISA's standards committee meetings which were happening at the same location. ISA standards were something that I had been using for years, but at the time I didn't know much about how they were developed. Knowing that that ISA5 "Documentation of Measurement and Control Instruments and Systems" and ISA20 "Specification Forms for Process Measurement and Control Instruments" are two groups of standards that are used daily in our profession, I soon joined the standards committees

for them. My decision to get involved with the standards committees has proven to be very beneficial for my career.

The water/wastewater division has been helpful for me as well. With the advent of the social networking, my water/wastewater division membership has become extremely helpful as a way to network and get advice from peers in the industry. Working with automation and instrumentation in the water/wastewater field is a niche area so it is great to have an ISA division that is dedicated to supporting it.

WWID: I understand that you only recently started attending the annual ISA Water/Wastewater and Automatic Controls Symposium. What did you enjoy and find most worthwhile at the symposium? Would you recommend the ISA WWAC symposium to others?

Ingham: The 2011 ISA WWAC symposium was my first and I found it very enjoyable and useful. It covered topics directly related to current water/wastewater issues such as commissioning and SCADA. The get-togethers at lunch and afterwards allowed me to meet people in my industry and discuss common issues with my industry peers. One of the great benefits is that it provides a venue to share experiences and advice that is relevant to our water/wastewater sector. I am looking forward to attending the WWAC symposium again in 2012.

WWID: Do you have any advice you would give to a young engineer or technician considering attending the ISA WWAC symposium for the first time?

Ingham: It's well worth the trip! For a young water and wastewater professional it's the best place to meet experienced people in your industry with whom you can discuss the successes and challenges you have encountered. The networking is fantastic and you will make new friends and contacts that will come in handy as your career moves forward.

WWID: What do you like most about being an ISA member?

Ingham: The ISA has a strong tradition of developing leadership within its ranks. My involvement in the ISA and my career have grown along with each other. I have been fortunate to belong to a very active ISA section in Edmonton, Alberta, Canada. The Edmonton ISA Section is a large and vibrant section which holds monthly technical and executive dinner meetings. I started out attending the dinner technical sessions and was soon asked to participate in the executive as the standards and practices chair. This around the same time I become involved with the ISA5 and ISA20 standards committees.

Since joining the Edmonton Section executive I have gone on to be vice president, president and past president for the section. ISA has contributed greatly to my training as a leader and meeting the top people in our industry. As a member of a standards committee I feel I have passed on some of my knowledge to be used by others.

WWID: Do you have any advice for a young engineer or technician considering getting involved with the water/wastewater sector?

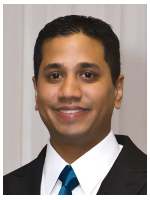
Ingham: The best advice I can give, and this applies to all young engineers, technologists and technicians, is to get active in your local ISA and attend ISA symposia/shows where you can network and make contacts with others in the profession. Over the span of one's career these contacts can be the most important asset one can have. In my case, some of my contacts have gone on to be officers of large companies, deputy ministers in government, government safety inspectors, and highly-respected senior members of our industry. I simply cannot stress the importance of networking and making contacts. The ISA is extremely helpful for establishing your network of contacts that you draw on when you need advice.

WWID: Thank you very much for taking the time to speak with us for this interview.

Ingham: My pleasure!

(Note: This interview has been edited for length and clarity.)

Introducing New WWID Exec Members



Kevin Patel, PE, MBA

WWID Membership Chair

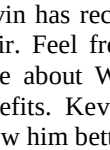
Phone: (214) 346-2800
Email: patelkn@cdm.com

Automation Engineer & Project Manager
CDM – Dallas/Fort Worth, Texas office

Kevin has recently joined us as our new WWID membership chair. Feel free to contact him with any questions you may have about WWID membership and/or WWID membership benefits. Kevin has provided us with a brief bio you can get to know him better.

An automation engineer and project manager, Kevin Patel, P.E. began his career as a co-op student with CDM while earning his bachelor's degree in Computer Engineering from Texas A&M University in 2003. It was during this time that Kevin was introduced to supervisory control and data acquisition (SCADA) systems, including programmable logic controllers (PLCs), remote telemetry units (RTUs), distributed control systems (DCS), and human machine interfaces (HMIs). In addition to learning valuable lessons – such as, PLCs that require 24 volts don't like getting 120VAC signals -- the opportunity to break down complex algorithms and develop operator friendly graphics using his own creativity, resulted in Kevin being hooked on automation.

In 2011, Kevin received an MBA from the University of Texas at Dallas. Over the last 9 years, he has led and managed some of CDM's most highly technical application projects while utilizing extensive quality control procedures on both new and existing plants. Kevin's experience includes designing, integrating and programming instrumentation and control (I&C) systems primarily for water and wastewater treatment facilities. He is a current member of the ISA101, ISA105, ISA106 and ISA18 committees related to HMI, testing, automation, and alarming and looks forward to serving on the WWID committee.



Pavol Segedy

WWID Section-Division Liaison

Phone: (919) 427-5313
Email: psegedy@nc.rr.com

Senior Engineer
Brown & Caldwell – Raleigh-Durham, NC office

Pavol has recently taken on the role as our ISA Section-Division Liaison. Within the ISA, sections play an important role by bringing together ISA members within their local geographic region. Our WWID division is not geographically based, so there is a lot of potential for us to reach out to the various ISA sections that our members belong to. Pavol is looking forward to forging ties between ISA sections and our ISA water/wastewater division. Pavol has provided us with a brief bio you can get to know him better.

My name is Pavol Segedy, and I have been a member of the ISA Water/Wastewater Industry Division since I becoming an ISA member. I started my career as a software engineer for a small company in Europe. I have been involved in the construction process of the Large Hadron Collider which is now the world's largest particle accelerator. After finishing my portion of the project, I received an opportunity to move into the water/wastewater industry. I graduated with an Automation and Control Engineering degree and was able to easily adapt to this process industry.

I am involved in design, specification and startup of plant instrumentation including Programmable Logic Controller programming, SCADA development and on-site construction support and inspection. I have worked on all phases of large and small projects from pre-design to final commissioning of electrical and control systems for water, wastewater and pump station facilities. I also provide project management, consulting services, support for completed projects as well as troubleshooting services to resolve issues in established plants. I am enjoying my career and am looking forward to further enhancing it by working with ISA Water/Wastewater Industry Division.

2011 WWID Division Award Winners

Each fall as part of Automation Week, an awards luncheon is held for ISA Technical Divisions. This year's awards luncheon was held on Tues, Oct 18, 2011 at the Arthur R. Outlaw Convention Centre in Mobile, Alabama, USA. The following WWID Awards were given out:

Outstanding Leadership Award

- Jon DiPietro (BridgeSoft LLC & Domesticating IT), ISA Boston Section

Member of the Year

- Graham Nasby (Eramosa Engineering), ISA Hamilton Section

The ISA Water/Wastewater Division also recevied honorable mention for "Most Outstanding Division" in the ISA Industries & Sciences Department.

Jon DiPietro accepting the WWID Outstanding Leadership Award from Honors & Awards Chair Michael Fedenyszen

The WWID's Honors and Awards program is administered by the water/wastewater division's Honors and Awards Chairman. This highly respected role is typically held by a past director of the division who is elected into the position by their peers. The 2011 Honors and Awards Chairman is Mr. Michael Fedenyszen, of the Vanderweil Engineers LLP. The WWID executive wishes to thank Mr. Fedenyszen for coordinating this year's WWID awards program.

Facilitator, Steve Valdez and H&A chair Michael Fedenyszen reviewing award recipients at the Fall Leaders Meeting

2011 WWAC Symposium Award Winners

The following awards were given out at the joint I&S/A&T Awards Luncheon in Mobile, Alabama on Oct 18, 2011 for the WWID's 2011 WWAC Symposium.

Best Symposium Presentation

In recognition of the best symposium presentation

1st Prize: Cameron Kamrani, Kamrani Engineering Inc.
"SCADA: An Integrative Approach"

2nd Prize: Scott Holzborn, Siemens Americas
"Leveraging Electronic Flowmeters to Improve Accuracy and Value in Water Management"

Best Symposium Paper

In recognition of the best technical paper

1st Prize: Graham Nasby, Eramosa Engineering Inc., and Matthew Phillips, City of Guelph Water Services Dept.
"SCADA Standardization: Modernization of a Municipal Waterworks with SCADA Standardization: Past, Present and Planning for the Future"

2nd Prize: Richard Birdsell, Orange County Sanitation District
Mike Puccio, Orange County Sanitation District
"Establishing a Successful Water/Wastewater Commissioning Program"

Cameron Kamrani (center) accepting the award for Best Presentation from Jon DiPietro and Michael Fedenyszen

Graham Nasby and Matt Phillips (center) accepting the award for Best Paper from Jon DiPietro and Michael Fedenyszen

PLANT AUTOMATION SPOTLIGHT

Thunder Bay Waterworks

By Ellen Fussell Policastro

The City of Thunder Bay is a growing community on the shores of Lake Superior in Ontario, Canada. Ranked as one of the top 10 cities for business in Canada, population is likely to continue to increase from the 120,000 citizens who live there today. To provide safe drinking water as well as protect the environment, Thunder Bay set a goal to implement lake-to-lake water management—taking water from Lake Superior through the treatment process to the distribution system, and then back through the pollution control plant before returning it to the environment. In less than a decade, Thunder Bay has succeeded.

The old electronics system used to be connected by a telephone line and involved local computers to transmit the information. "Moving to PLCs at each of the water stations tied all these systems together for easier decision making," said Carl Goodwin, process engineer at Thunder Bay. After expanding again in 2004, the plant is now updating its system for more effective process management by having the same software at all of their remote locations, "which cuts control costs and provides standardization at all locations," Goodwin said.

"The remote stations manage the water distribution system from source water treatment plant to the city limits," said John Marchant, electrical engineering technologist from AutomationNow, system integrator for the project. "These stations include booster pumping, water storage reservoirs, pressure zone stations and storm lift stations. There are a total of 16 new and existing stations online and two more currently in the construction phase." Integrating these stations into the current SCADA system was easy with the new system, he said.

"We now have greater station control," Goodwin said. "Operators at the central treatment plant can get information more quickly and can relay information back and forth," he said. "They can now remotely control these locations when before they could only gather data—no control process was available before. They have control over chlorine residual and water pressure. We even have a more efficient water model by being able to look at gaining energy efficiencies," he said. "Having this control, we can more fully implement a more efficient water model."

Lake-to-lake management

Thunder Bay was actually the first of its kind to achieve lake-to-lake water management by constructing an entirely new facility. While the previous plant used direct filtration with sand filters and disinfectants, the Bare Point Water treatment plant uses an advanced ultra filtration system to purify the city's water, while expanding daily capacity from 14 million gallons to 25 million gallons.

Challenges included integrating an existing pumping station with the new plant equipment as well as planning for future expansions. The initial facility had 12 PLCs, with 20 additional remote pumping stations to come that would incorporate PLCs from different manufacturers. Communications between the local PLCs and remote locations would be vital to the success of the project.

Without the ability to closely monitor and control this complicated system, the quality of Thunder Bay's water would be at risk. So it was critical to find the right supervisory control and data acquisition (SCADA) system—one versatile enough to meet the needs of the new facility plus its future expansion. Bare Point required accurate, real-time data-gathering to ensure reliable control of the plant's equipment, regardless of location. Recording and logging the data, sounding alarms for threshold conditions, and securely storing information were also priorities. The new system needed to be easy to use as well as provide comprehensive reports for management's informed decision-making.

A Windows-based system located in the operations center of the main plant controls the Bare Point plant software. "Redundant servers with UPS backup systems log over 5,000 points of data, 24 hours a day, 7 days a week," said Larry Levchak a manager at AutomationNow.

The human machine interface (HMI) software forms the core of the Bare Point system. In the application design phase, it provided power and flexibility as well as connectivity for the broad range of devices in the local and remote plant locations. Now operators can closely monitor pumps and control valves; graphics let them visualize water moving through the plant.

Working with the new software, the historian provides a high-performance, real-time, and historical database to integrate the operations center with the plant floor. As an extension of Microsoft SQL Server, the historian collects comprehensive Bare Point operating statistics while reducing the volume of data to store. And it integrates this information with event, summary, production, and configuration data.

For desktop-based analysis and reporting, another software package designed into the system allows Bare Point's process engineers to spot specific trends in real time and prepare historical reports, which they can export to Microsoft Excel. Simple point-and-click dialogs mean plant operators can trouble-shoot problems and identify operational inefficiencies more easily.

Alarms allow birds-eye view

Plant operators rely on the new SCADA alarm system to maintain water quality. If an instrument takes a reading that is out of a pre-determined range, an alarm sounds—both on the alarm screen and a plant-wide alarm system.

The new SCADA system allows operators to view all remote stations. The SCADA application runs on two redundant

servers. Should there be a failure, the secondary is the failover node to the primary. If communications are lost to the historian, the data continues to store locally, forwarding data when communications re-establish.

The "remote stations" menu helps with navigation, communications monitoring, and alarming for all stations located throughout the city of Thunder Bay. The menu heading will also indicate what screen the operator is currently on, including time, data, and the ability to silence the reactive alarms. The silence horn button will flash red when any unacknowledged active alarm is present. A keyboard button is for the tablet control. When the tablet is in use, it connects via remote desktop so there is a need to access a soft keyboard. The lower alarm template uses the bottom 100 lines of the screen. This alarm window distributes to be common to all workstations for alarm recognition.

"The operator can have a bird's eye view of the city of Thunder Bay with geographical location of all stations," Marchant said. When selecting the "location map" button, the city is displayed into two sections, Thunder Bay North and Thunder Bay South. When an operator clicks on any of the indicated stations, it will jump to that station information screen. "Each of the remote stations has a consistent look and feel to it," he said. On the lower edge of the process screen is a submenu. This allows the operator to view an alarm summary and a station utilities breakout, as well as make setpoint changes, and view trends.

Throughout the process, common popups are available to the operator. Using a popup screen helps control pumps. When clicking on a selected pump, a popup will appear with the required control and information of that pump. The popup will give the option to start or stop the pump. It indicates whether the pump is ready and running. Status displays tell if the pump is in "hand" or PLC mode. When in PLC mode, you can control the pump manually or automatically.

Lower upgrade costs, less development time

With remote stations that attach seamlessly to the existing network, development time is minimal, and "the operators can control and monitor the plant from a single terminal if required," Marchant said. With such a structured programming regime, "it was easy to integrate the remote stations. All other station configuring and programming aside, upgrading the stations only required about two days on average to develop and commission each station."

The training facility also gives instructors project live views of the operations, providing a highly productive environment for learning, group analysis, and troubleshooting. "It's very easy to use," said Michelle Warywoda, a process engineer at Bare Point. "I am able to pull whatever parameters I need into one trend and see how they're related and make better-informed decisions."
"The ease of use is the same for everyone," said Mike Bazdarick, a water treatment supervisor at Bare Point. "That gets everyone on the same page really fast. And that's important when you want to increase efficiency and run your plant the best that you can."

The city of Thunder Bay saves man hours per station, which lowers the cost of the upgrades. "The production of water at the treatment plant is important, but the system is only as good as its distribution," Marchant said. "All corners of the city can now be monitored and any issue corrected quickly and efficiently." As a result, the new water distribution system has led to a reduction in costs and an increase in efficiency from the first day the system was online.

Return on investment came in record time because "real-time reporting enabled more effective regular maintenance for reduced downtime," Marchant said. "And historical trending reports led to greater visibility and increased operational efficiencies." But the integrator expects the biggest return on investment to come as the plant adds future remote stations, which means development time for the additions could be cut in half.

ABOUT THE AUTHOR
Ellen Fussell Policastro is the associate editor of *InTech*. Her e-mail is efussellpolicastro@isa.org.

Backgrounder on the Thunder Bay Waterworks

By Ellen Fussell Policastro

Thunder Bay's 125,000 residents get their drinking water from two municipal water treatment plants, Lock Lomond and Bare Point. However, in 2003, after completing a Class Environmental Assessment (Class EA) process, the city's Council decided to retire the Lock Lomond plant and to upgrade and expand the Bare Point facility to provide all the community's drinking water from a single source.

The membrane filtration system consists of five trains of ultra-filtration membranes. These hollow fiber ultra-filtration membranes use gentle suction to filter impurities from water.

Thunder Bay's drinking water distribution system includes five storage facilities—the Hodder Avenue standpipe, Duke Street reservoir, McIntyre reservoir, Hazelwood reservoir, and the newly constructed Rockcliff reservoir. While some parts of the distribution system date back to 1909, the average age of the pipes is about 50 years old. Water can be moved back and forth between the two distribution systems as needed through the James Street and Vickers pumping stations.

The retirement of the Lock Lomond treatment plant took place in February 2008. The Bare Point plant—originally built in 1903, and expanded in 1970 and again in 2007 to its current capacity of 113.5 million liters per day—will then supply the entire city's drinking water. Bare Point's treatment methods include pre-chlorination, coagulation-flocculation, membrane ultrafiltration, and post-chlorine disinfection. The plant's unique ultrafiltration system represents state-of-the-art technology.

The membrane filtration system consists of five trains of ultra filtration membranes. These hollow fiber ultra filtration membranes use gentle suction to filter impurities from water.

TECHNICAL ARTICLE

Reducing Fluid Surges ("Hammering") in a Pipe System using Pump Control

Edited by Steve D. Batson, Rockwell Automation

I. Industry Overview

Surges or pressure transients occur in centrifugal pumping systems when any sudden change of flow is introduced. These surges can result from starting and stopping a pump, opening or closing valves and many other sources in a particular system. There are a number of mechanical surge reduction techniques, but these tend to be costly and complex. Electronic starting and stopping of the pump motor will be explored as a cost-effective solution that reduces surges or hammering problems.

From the Affinity Laws for Pumps we see:

$$\frac{Q2}{Q1} \propto \frac{N2}{N1}$$

Where
N = Pump Speed
Q = Flow (CFM)

Therefore, we can directly relate the percentage of change in pump speed to the percentage of change in flow output from the pump.

Centrifugal pumps are generally coupled directly to the shaft of an electric motor. When the motor is started by applying full line voltage, the pump is accelerated from zero speed to full speed very quickly. Less than 1/4 second is not uncommon. This means that the flow out of the pump also increases from zero to total capacity in less than 1/4 second. Due to the fact that fluids are only slightly compressible and have momentum, this large change in flow over such a short period of time results in high and low pressure surges and cavitation as the system seeks equilibrium. This results in many undesirable effects.

Pressure surges stress the walls of the pipe and cause an audible noise. The sound is as if the pipe was struck with a mallet repeatedly. The noise is responsible for the term "Water Hammering" or just plain "Hammering" being applied to this phenomenon. But the sound created is trivial when compared to the physical damage that pressure surges can cause. Extremely high pressure transients can cause the pipe to burst while extremely low transients can cause pipes to collapse. Cavitation produces zones of highly agitated liquid and partial vacuums whereby the pipe lining may be eroded and the liquid may be boiled off. These effects also damage the valves and fittings. All of these effects are objectionable.

Since hammering is caused by rapid changes in flow, the hammering caused by starting and stopping the pump can be minimized by controlling the acceleration and deceleration of the pump motor. To understand how fluid flow is affected during the starting and stopping of a pump motor, a review of the various starting and stopping methods is necessary.

The three methods of starting and stopping a pump motor to be reviewed are as follows:

- Direct On Line
  (closing a contactor and applying full voltage to the motor)
- Solid state reduced voltage starting
- Soft starters with pump control curves

Before comparing the three methods of starting, it is necessary to establish the relationship between the pump system and pump motor.

II. Pump System and Pump Motor Relationship

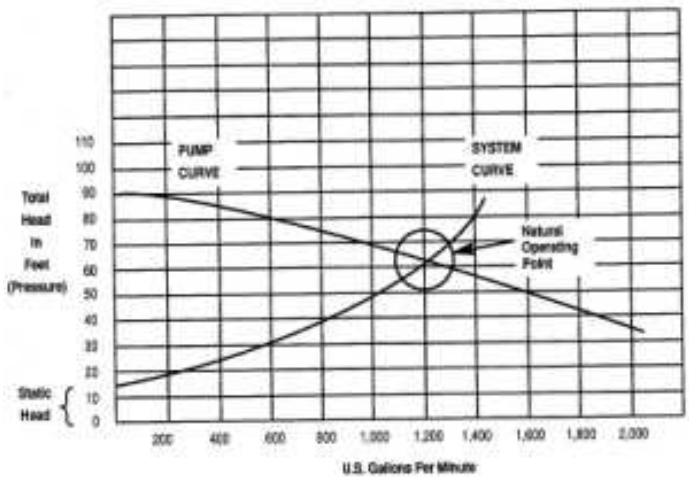


Figure 1 - Pump Curve versus System Curve.

Figure 1 shows two independent curves. One is the pump curve which is solely a function of the physical characteristics of the pump.

The other is the system curve which is dependent on the pipe diameter and length, the number and location of elbows, and many other factors. The intersection of these two curves is called the natural operating point.

Another Affinity Law states:

$$\frac{P2}{P1} \propto \left(\frac{N2}{N1}\right)^2$$

Where
N = Pump Speed
P = Pressure (Feet of Head)

Therefore, we can say that the change in pressure is proportional to the square of the speed.

For a pump motor (AC induction motor) driving a variable torque load, such as a centrifugal pump, the following is true:

$$\frac{T2}{T1} \propto \left(\frac{N2}{N1}\right)^2$$

Where
N = Pump Speed
T = Motor Torque

Since the pump is directly coupled to the shaft of the motor:

$$\left(\frac{N2}{N1}\right)^2 \propto \frac{P2}{P1} \propto \frac{T2}{T1}$$

Therefore, change in pressure is directly proportional to change in motor torque.

Motor characteristics are described in terms of Speed/Torque curves. Since we have determined that flow is proportional to speed, and pressure is proportional to torque, we can plot the pump torque requirement and the motor torque curve on the same graph.

III. Direct on Line Starting

Figure 2 shows the speed torque characteristics of a pump (AC induction) motor started Direct On Line (DOL) with the load requirements of a centrifugal pump superimposed. Note that at 100% speed the two curves intersect. The motor meets the full load requirements of the pump system. Motors are selected to meet the pump load requirements based on this single point in the two curves.

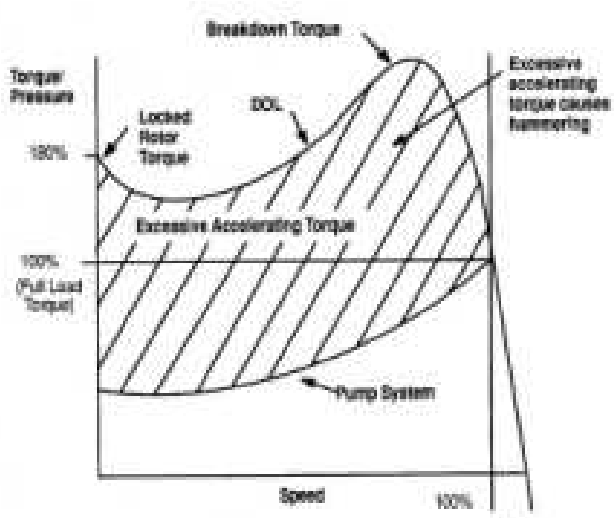


Figure 2 - Speed vs. Torque for DOL Starting

Unfortunately, the motor torque output more than exceeds the requirement of the pump during the start cycle. Locked rotor torque (LRT) is the torque developed by the motor the instant full voltage is seen at the motor terminals at zero speed. LRT can be as high as 180% of the torque the motor produces at full speed. Breakdown Torque (BT) is the highest amount of torque the motor can develop. BT can be as high as 250% of full load torque. The difference between the torque produced by the motor and that required by the load is called Accelerating Torque.

Accelerating Torque is the torque that causes the motor to rotate the connected load. In the case of the pump, the excessive accelerating torque produced by starting the motor DOL causes the pump to come up to speed very quickly, typically in less than 1/4 second. The result of this sudden change in speed (and therefore flow) is "surges" or "hammering" in the pipe system.

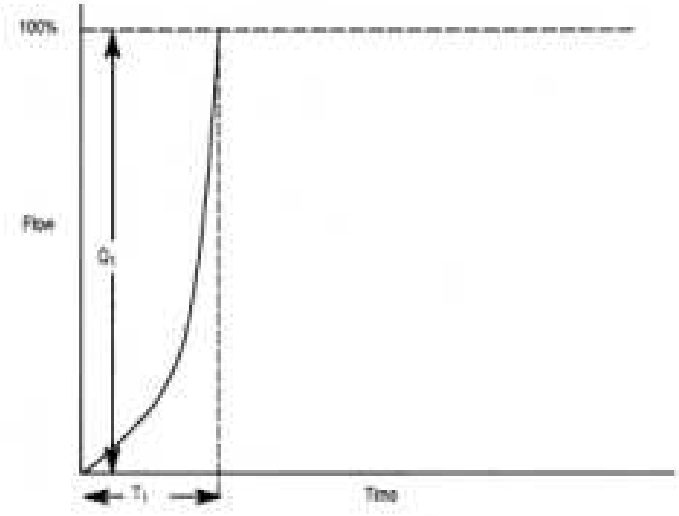


Figure 3 - Change in the Flow vs. Time – DOL Starting.

To look at the problem another way, as shown in Figure 3, there is a very large change in flow (Q_1) in a very short period of time (T_1). This is due to the large acceleration torque shown in Figure 2 resulting in system hammering during starting of the pump motor.

IV. Solid-State Reduced Voltage Starting

If the period of time in which the flow goes from zero to 100% can be increased, hammering can be reduced. This can be achieved by reducing the amount of accelerating torque delivered by the motor. Less accelerating torque means less force to turn the load and therefore more time required to change the speed of the pump. This can be done using a solid state reduced voltage starter to slowly ramp the voltage applied to the motor from zero to full voltage over some preset time (adjustable from 2 – 30 seconds).

The formula for torque in an induction motor is:

$$T \propto V^2$$

Where
T – Motor Torque
V = Voltage

From this equation we can see that the torque produced by a motor will vary by the square of the voltage. Therefore reducing the voltage by 50% will reduce the torque to:

0.5 x 0.5 = 0.25 or 25%

Twenty-five percent of the initial torque is now available. If the locked rotor torque was 180% then:

180% x 0.25 = 45%

The new value of initial torque is 45% of the full load torque.

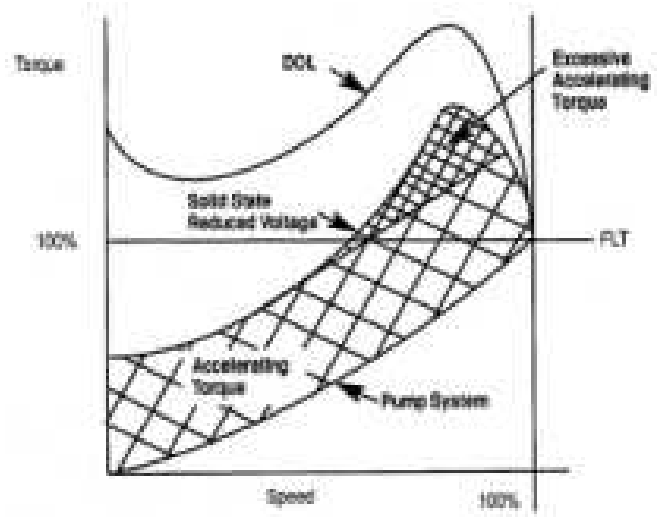


Figure 4 – Speed Torque for DOL vs. Solid State Reduced Voltage Starting

Figure 4 compares the Speed Torque characteristics for DOL starting and solid state reduced voltage starting of an induction motor. Note that the accelerating torque has been greatly reduced versus the DOL method of starting the pump motor. This is caused by the solid state motor controller's ability to start at a lower value of initial voltage and to "ramp" up to the full voltage value over an adjustable time period. The torque applied to the motor also "ramps" up.

At the end of the "ramp," however, there is an excessive acceleration torque as shown in Figure 4. This sudden change in torque generates a corresponding burst of speed (flow) at the end of the start cycle and results in hammering.

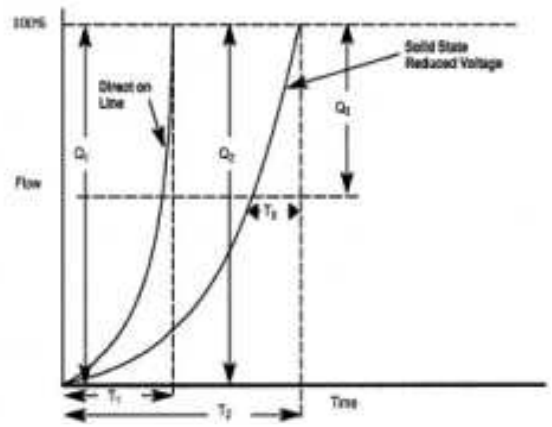


Figure 5 - Change in Flow Versus Time.

Again the nature of fluids comes into play. In Figure 5, flow (speed) versus time is compared for the two methods. Note the ultimate flows (Q_1 and Q_2) are the same, but the time vanes. T_2 is longer than T_1 so there has not been a sudden surge on the system. However, when observing Q_3 versus T_3 there is still a rapid change in flow (Q_3) versus time (T_3). There is still excessive acceleration torque as the pump motor rapidly approaches 100% speed. This is a result of the BT, which is still present when using a solid state reduced voltage starter. This sudden surge in pump motor torque at the end of the start cycle results in a flow surge.

The sudden surge in torque is due to the characteristics of the motor. It occurs because solid state reduced voltage starting ramps the voltage up without regard to the motor's performance. In centrifugal pumping applications the result is hammering.

As shown, solid state reduced voltage starting improves starting torque characteristics of the pump motor, but cannot control Breakdown Torque (BT), which causes surges.

This is where a soft starter with a preprogrammed pump starting curve can be helpful.

V. Advanced Solid State Control for Starting Pumps

When an advanced solid state motor starter that has customized starting curves for pump control, the surge produced during DOL and Solid State Reduced Voltage is greatly reduced. This can be done by using an intelligent soft-starter to carefully control the torque output of the motor.

Since there are no sudden changes in torque, this translates into a smooth acceleration of the motor minimizing surges or hammering in the system.

Figure 6 compares DOL starting, Solid State Reduced Voltage, and Pump Control starting speed torque curves.

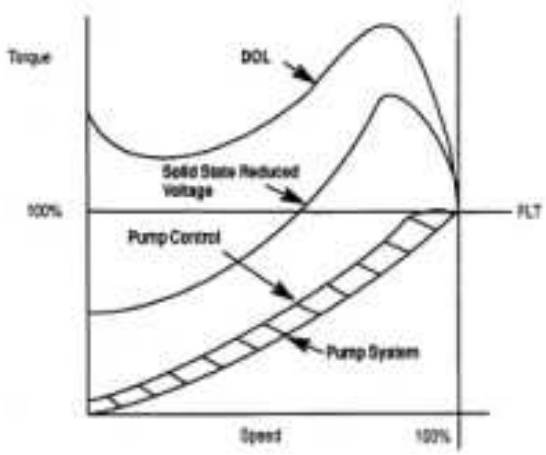


Figure 6 - Soft Start with Pump Control and the resulting Pump Speed Torque Curve

In Figure 7, Flow versus Time is compared for the three starting methods.

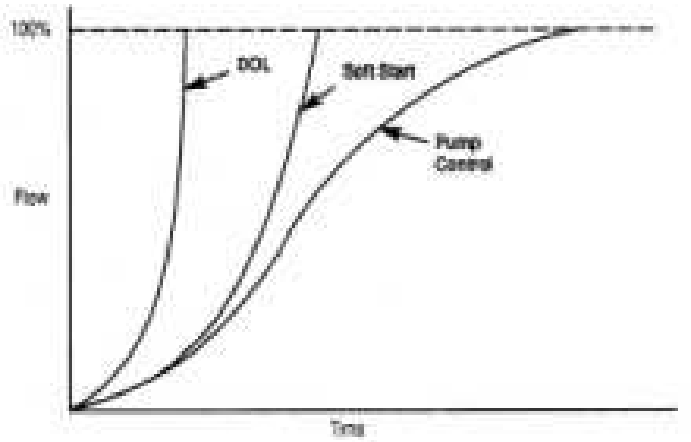


Figure 7 - Change in Flow Versus Time.

Pump Control reduces sudden change in flow by controlling the accelerating torque of the pump motor and extending the time to produce a 100% flow, thus minimizing "hammering." This is the desired effect and is the key to the Pump Control Option: there are no sudden changes in torque. This is what is needed to reduce surges. Therefore, hammering is reduced in the pumping system.

VI. Advanced Solid State Control for Stopping Pumps

So far, we have only discussed starting techniques. Stopping the pump is as critical in reducing surges and hammer as starting. In this discussion we will limit the examples to speed (flow) versus time. Refer to Figure 8.

When a DOL starter is applied, the pump motor will coast when a stop command is initiated (see DOL Coast Stop in Figure 8).

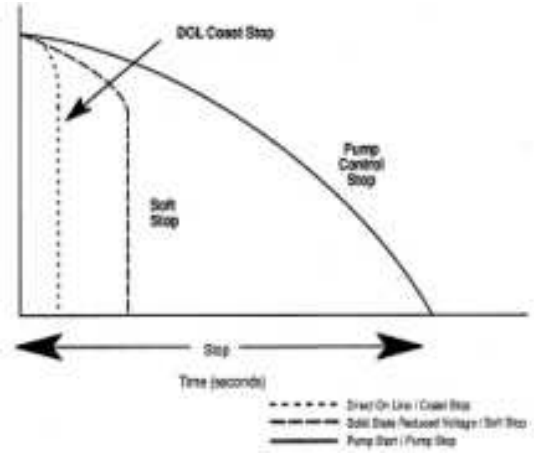


Figure 8 - Using a soft starter for Stopping Pump Motors.

The system head will quickly overcome the motor inertia and the pump will come to a rapid stop. The fluid, which is in motion and has momentum, must come to a complete halt as well. This action causes pressure surges on the pipes and valves. This is undesirable due to the damage caused in the system.

Many control manufacturers are promoting a solid state reduced voltage starter with a soft or extended stop as a

solution to surge or hammering problems. In most applications Soft Stop cannot prevent sudden changes in motor torque required on pumping applications. When a Soft Stop is initiated, the voltage is ramped from full voltage to zero volts over a time selected by the user (see Soft Stop in Figure 8 on page 10). As shown before, reduction in voltage results in reduction of torque and the pump begins to slow down. However, a point is quickly reached where the load torque demand exceeds the motor torque supply and the motor stalls. The effect, though not as severe, is the same as slamming a valve closed, and hammering occurs.

A well designed and properly configured soft starter for a pump application will control the deceleration of the pump motor in a method similar to the control of the acceleration. When a stop command is initiated, the controller reduces the motor speed to prevent any sudden changes in torque, minimizing surges in the System. The soft starter will then continue to reduce the torque of the pump motor resulting in a speed characteristic as illustrated in Figure 8. This type of pump motor deceleration curve results in minimal surges or hammering in the system as there will not be sudden changes in flow.

VII. Using Advanced Solid State Soft Starters for Starting and Stopping Pump Motors

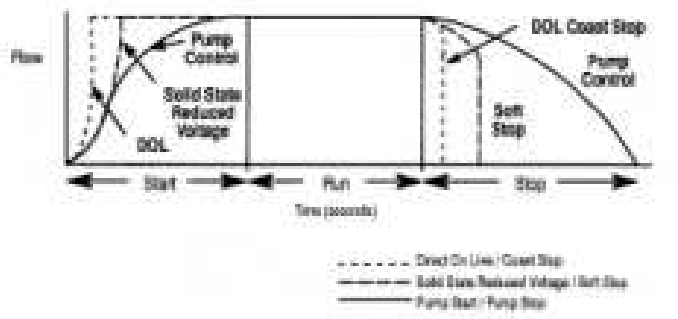


Figure 9- Using a soft starter for starting and stopping pump motors.

To summarize, Figure 9 compares flow versus time when different starting/stopping techniques are employed. When properly sized and tuned, a soft starter can produce the most desirable flow characteristics when starting and stopping centrifugal pump motors. There are no sudden peaks or breaks in flow which result in surges or hammering in the system.

When analyzing what is to be done about a hammering problem, an electrical solution should be considered before a mechanical solution. The initial cost for the electrical solution tends to be less than that of a specialized control valve, and less complex. In addition, the frequent maintenance-related system shutdowns that would be required with the specialized valve are not required with an electrical solution.

The effective use of soft starts can be a simple yet effective starting and stopping method for centrifugal pump systems.

VIII. Special Features Often Found on Soft Starts

Soft Starts can be used on applications other than pumps for controlling the starting and stopping of AC induction motors. During starting, a soft start can minimize mechanical shocks to the system. They can also be applied to minimize line disturbances that occur on the power system when a motor is started direct on line.

A well designed soft start will provide microcomputer controlled starting for standard three-phase squirrel cage induction motors. The following starting modes of operation are often available on higher-end soft start units:

- Soft Start with Kick Start
- Current Limit
- Full Voltage

On some soft starts a built-in **energy saver** feature allows the controller to save energy on applications where the motor is lightly loaded or unloaded for long periods of time.

Optional features often found on soft starts include:

- Soft Stop
- Preset Slow Speed
- Pump Control
- Smart Motor Braking
- Predetermined stopping position
- Slow Speed with Braking
- Integral Bypass
- Multiple communication options such as Ethernet and/or various industrial communication networks/busses

IX. Summary

Soft starts are an important technology for the effective application of pumps when a full-featured Variable Frequency Drive (VFD) cannot be justified. Integration into an integrated control system for control, monitoring and diagnostics is easily obtained through multiple communications options.

ABOUT THE AUTHOR
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WWID is on LInkedIn

Visit our LinkedIn group

LinkedIn is a social media site that is geared towards professionals and business people. Located at **www.LinkedIn.com**, the site features online profiles, discussion groups and tools for identifying and keeping track of contacts. LinkedIn currently has over 120 million members and is still growing.

In an effort to provide the latest news and information relating to instrumentation and control systems in water and wastewater management, the Water and Wastewater Industry Division has created a LinkedIn group. We invite anyone affiliated with or interested in the water and/or wastewater industries to join the group and participate in the dialog.

You may use the following link to join the group: **http://www.linkedin.com/groupRegistration?gid=2031271**

About LinkedIn

For those who may not be familiar, LinkedIn is a free social networking web site for professionals:

LinkedIn is an interconnected network of over 120 million experienced professionals from around the world, representing 170 industries and 200 countries. You can find, be introduced to, and collaborate with qualified professionals that you need to work with to accomplish your goals.

When you join, you create a profile that summarizes your background and professional accomplishments. Your profile helps you find and be found by former colleagues, clients, and partners. You can add more connections by inviting trusted contacts to join LinkedIn and connect to you.

Your network consists of your connections, your connections' connections, and the people they know, linking you to thousands of qualified professionals.

There are already many ISA members and automation professionals on LinkedIn, as well as several other ISA-related groups. If you'd like to learn more about LinkedIn, the article "100+ Ways to Use LinkedIn" provides many different perspectives on how the site can be leveraged. We hope you'll join us there and network with other ISA, water, and wastewater professionals.

New WWID Members

Recently joined August to September 2011

The Water/Wastewater Industry Division would like to extend a warm welcome to our recently joined members.

August 2011

Mr. Ricardo A. Aguirre - Los Olivos, , Peru
Mr. Ronald P. Arns, Jr. - Baldwinsville, NY, USA
Mohammad Ashrafzadeh - Woodland Hills, CA, USA
Mr. Benjamin P. Auclair, CCST - Louisville, KY, USA
Ovanio H. Avalos - Santa Tecla, La Libertad, El Salvador
Mr. John-David Bamford - Englewood, CO, USA
Mr. Dipakkumar S. Bhagat, CCST - Chino, CA, USA
Abhai Bhatia - Long Beach, CA, USA
Ms. Monica R. Campanella - La Mesa, CA, USA
Mr. Adnen Chaabane - Salinas, CA, USA
Mike Dillon - Westminster, CO, USA
Mr. Jon DiPietro - Manchester, NH, USA
Mr. Jason A. Fransz, Sr. - Lake Elsinore, CA, USA
Felippe Fattori Gonçalves - Rio Das Ostras, RJ, Brazil
Carlo Gorissen - Auckland, , New Zealand
Mr. Bert Griggs - Olathe, KS, USA
Mr. David Harman - Calgary, AB, Canada
Mr. Goodwin Kaisara - Gaborone, , Botswana
Mr. Eugene Larose - Ridgefield Park, NJ, USA
Mr. Bob Leddy - Burbank, CA, USA
Mr. James Marsh, Jr. - Ventura, CA, USA
Mr. Gary L. Milbourne - Indian Harbour Beach, FL, USA
Mr. Raymond J. Neher, CCST - Grand Blanc, MI, USA
Mr. Tara S. Rana - Hamilton, ON, Canada
Mauricio A. Real - Scottsdale, AZ, USA
C. S. Reece - Brentwood, TN, USA
Mr. Mike Ross - Fenton, MO, USA
Mr. Luciano Dos Santos Silva - Petrolina, , Brazil
Mr. David Trotter - Highland, CA, USA
Mr. Mazimiliano Vicente Delgado - El Puig, VALENCIA, Spain
Mr. Leigh Weber - Harleysville, PA, USA
Mr. Timothy Gene Wiley - Orlando, FL, USA

September 2011

Mr. Orlando Camarillo - Houston, TX, USA
Jaime Marcelo Cedeño - Guayaquil, , Ecuador
Mr. Stephen E. Clark, Jr. - Dedham, MA, USA
Ms. Raluca F. Constantinescu - Redding, CA, USA
Mr. Charles Phillip Davis, Jr., CCST - Lothian, MD, USA
Mr. Christian Dejean - Boucherville, QC, Canada
Mr. Ken Donahue - Virginia Beach, VA, USA
Mr. Darin Drisner - Edmonton, AB, Canada
Kristen Fulk - Sturtevant, WI, USA
David Hackstadt - Mooresville, IN, USA
David Huang - Mississauga, ON, Canada
Greg Knowles - Las Vegas, NV, USA
Tyler Korell - Boise, ID, USA
Patrick R. McCafferty - Dedham, MA, USA
Mr. Tim U. McElmurry - Houston, TX, USA
Mrs. Cheryl Menzies - Mississauga, ON, Canada
Mr. Scott M. Molinari - Azusa, CA,
Mr. Emmanuel Osawe - Fairfield, CA, USA
Mr. Djamel Rami - Edmonton, AB, Canada
Mr. Darcy Robinson - Winnipeg, MB, Canada
Mr. António Alcides Silva Amaral - Amadora, , Portugal
Mr. Tiago Silva Barbosa - Serra, Espirito Santo, Brazil
Bill Storey - Pleasanton, CA, USA
Mr. John D. Thomas - Morton Grove, IL, USA
Mr. Gerardo Yniguez, P.E. - Los Angeles, CA, USA

2011 ISA Technical Division Awards

As awarded on Oct 18, 2011

At the Joint I&S and A&T Awards Luncheon held on Oct 18, 2011 the ISA announced the winners of the 2011 ISA Technical Divisions Awards. There were presented in Mobile Alabama during ISA Automation Week: Technology and Solutions Event. The conference took place 17-20 October at the Arthur R. Outlaw Convention Center in Mobile, Alabama, USA.

Technical Divisions are ISA membership groups that offer networking and educational activities with members around the world who work in the same industries or who have the same technical interests. Networking can be done via email discussions lists, in person at events and via newsletters. Technical Division members are encouraged to write, review, and present technical papers at ISA symposia and ISA Automation Week; and to publish technical papers. Division members also plan and conduct annual symposia.

ISA has 16 Technical Divisions that are divided between two departments, the Automation and Technology Department and the Industries and Sciences Department.

The awards from these two departments were presented as follows:

Industries and Sciences Department

2011 Outstanding Division
- Power Industry Division

2011 Outstanding Division, Honorable Mention
- Water and Wastewater Industries Division (WWID)

2011 Communications
- Food and Pharmaceutical Industries Division (FPID)

2011 Most Improved Division
- FPID Division

Automation and Technology Department

2011 Outstanding Division
- Analysis Division

2011 Outstanding Division, 1st Honorable Mention:
- Communications Division

2011 Outstanding Division, 2nd Honorable Mention:
- Management Division

2011 Communications:
- Analysis Division

2011 Most Improved Division:
- Communications Division

In addition, Dr. Peggie Ward-Koon was recognized for her work as Industries and Sciences Department vice president from 2009 through 2011.

New ISA Book

"Start-Up: A Technician's Guide – 2nd Edition"

Our friends in the ISA publications department are pleased to announce the publication of *Start-Up: A Technician's Guide, Second Edition*, by Diane R. Barkin.

Barkin wrote *Start-Up: A Technician's Guide, Second Edition* with the technician in mind. It is a non-mathematical, practical book that provides an overview of the scope of duties a technician must perform in real-world situations.

The author has updated her publication significantly since the first edition. She has added content regarding project execution, information concerning various systems and the personnel a technician will work with in the current manufacturing environment.

When new plants or systems go online, Control Systems Technicians face special challenges. The start-up may be a newly built, substantially changed, or a portion of a manufacturing facility. Barkin explores and explains the crucial role a technician plays in the process. From the first start-up team meeting to the last round of tuning and loop checking, she uses her extensive practical experience in the process control field to walk through the issues and skills typically required during a start-up.

Each chapter includes self-study learning objectives, practice questions and exercises, answers and references to industry practices and standards.

"Start-Up: A Technician's Guide, 2nd Ed." can be purchased from the ISA's online bookstore at www.isa.org/books

ISA on the Road

2012 USA Science & Engineering Festival

The Automation Federation (AF) announced today that AF and the International Society of Automation (ISA) will exhibit at the 2nd USA Science & Engineering Festival, which will be held 28–29 April 2012, at the Walter E. Washington Convention Center and other key locations in Washington, D.C., USA. The festival is a celebration of science and engineering and will feature more than 1500 hands-on activities and more than 75 performances.

The USA Science & Engineering Festival is the country's largest national science festival. It was developed to increase public awareness of the importance of science and to encourage youth to pursue careers in science and engineering by celebrating science the same way people celebrate Hollywood celebrities, professional athletes and pop stars.

"AF and ISA have chosen to exhibit at the festival because we are committed to promoting science, technology, engineering and math education (STEM) to youth and to building the next generation of automation professionals," said Mike Marlowe, Automation Federation managing director. "Careers in automation are exiting, rewarding, and important to our future," he added. "Through our exhibition, AF and ISA aspire to increase awareness of the importance of automation and engineering among young people and to invite them to explore the fascinating career paths in automation."

Learn about the Automation Federation's workforce development initiatives at www.automationfederation.org .

Call for Newsletter Articles

The WWID newsletter is published four times a year (spring, summer, fall, winter) and reaches the WWID's over 1,700 members. Each issue is approximately 20-30 pages long. The newsletter is distributed electronically in color PDF format.

We are always on the lookout for good articles, and we welcome both solicited and unsolicited submissions.

Article submissions should be 500-1500 words in length and be written for a general audience. While it is understood that the articles are technical in nature, the use of technical jargon and/or unexplained acronyms is to be avoided. While not specifically required, we encourage authors to submit several photos and/or figures to go along with their article submission.

We actively welcome articles from all of our members. However, we do ask that articles be non-commercial in nature wherever possible. One or two mentions of company and/or product names for the purposes of identification is acceptable, but the focus of the article should be technical content and not just sales literature. We ask that authors keep this in mind when submitting articles/content. If you are unsure of whether your article idea would be acceptable, please contact our newsletter editor for more information – we are here to help. With this said, we have had many excellent vendor-written articles in the past, and we look forward to many more.

Some examples of the types of articles we are looking for include:

- Explanatory/teaching articles that are meant to introduce or explain a technical aspect of automation and/or instrumentation in the water/wastewater sector.
- Biographical stories about well-known personalities in the water/wastewater sector.
- Case Studies about plant upgrades and/or the application of new technologies and techniques. This type of article must include at least two photos along with the article text.
- Pictorial Case Studies about a plant upgrade consisting of 4-6 photos plus a brief 200-500 word description of the project undertaken. The article should ideally include one to two paragraphs about lessons learned and/or advice for other automation professionals.
- Historical reflections on changes in technology pertaining to specific aspects of instrumentation or automation, and how these changes point to the future.
- Discussions about changes in the water/wastewater sector and how these affect the automation professionals.

Once we receive a submission, we will work with you to edit it so it is suitable for publication in the newsletter.

Article submissions can be sent to the WWID newsletter editor Graham Nasby at graham.nasby@eramosa.com

WWID Newsletter Advertising

The WWID newsletter is an excellent way to announce new products and services to the water/wastewater automation community. With a circulation of over 1,700 professionals in the automation, instrumentation and SCADA fields, the WWID newsletter is an effective targeted advertising tool.

The WWID newsletter is published quarterly, on the following approximate publication schedule:

- Spring Issue – published in May/June
- Summer Issue – published in August/September
- Fall Issue – published in October/November
- Winter Issue – published in January/February

Advertising in the newsletter is offered in quarter page and eighth page formats. The eighth page size is approximately the size of a North American business card. Advertisements can be purchased on a per issue basis or for four issues at a time. The newsletter itself is distributed as a full-color PDF, so both color and black/white advertisements are accepted.

The current advertising rates are as follows:

Per Issue:
- Quarter page ad (3.5" W x 4.5" H): $100
- Eighth page, business card ad (3.5" W x 2.0" H): $50

Per year (4 issues):
- Quarter page ad (3.5" W x 4.5" H): $325
- Eighth page, business card ad (3.5" W x 2.0" H): $175

Other sizes of advertisements are available, but are priced on an individual basis. Please contact our newsletter editor for more information.

Please book advertising space as early as possible before the intended publication date. Artwork for advertisements should be submitted a minimum of two weeks prior to the publication date; earlier is always better than later. Artwork for advertisements can be submitted in EPS, TIF, PNG, JPG or GIF formats. EPS and PNG formats are preferred. Images should be submitted with at least 300dpi resolution if possible.

The ISA Water/Wastewater Industry Division is run on a non-profit basis for the benefit of its members. Monies raised from the sale of advertising in the newsletter are used to help offset the cost of division programming and events. Like its parent organization, the ISA, the WWID is a non-profit member-driven organization.

For more information, or to discuss other advertisement sizes not outlined above, please contact the WWID newsletter editor Graham Nasby at graham.nasby@eramosa.com.

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Symposium Details
Date: August 7-9, 2012
Location: Orlando, Florida, USA
Call for Papers: to be announced shortly
Website: www.isa.org/wwac

About the ISA Water/Wastewater Division

The ISA Water and Wastewater Industry Division (WWID) is concerned with all aspects of instrumentation and automated-control related to commercial and public systems associated with water and wastewater management. Membership in the WWID provides the latest news and information relating to instrumentation and control systems in water and wastewater management, including water processing and distribution, as well as wastewater collection and treatment. The division holds an annual symposium that features presentations by industry practitioners and published proceedings.

About the ISA

Founded in 1945, the International Society of Automation is a leading, global, nonprofit organization that is setting the standard for automation by helping over 30,000 worldwide members and other professionals solve difficult technical problems, while enhancing their leadership and personal career capabilities. Based in Research Triangle Park, North Carolina, ISA develops standards; certifies industry professionals; provides education and training; publishes books and technical articles; and hosts conferences and exhibitions for automation professionals. For more information see www.isa.org

TOP TEN Reasons for Unsuccessful SCADA System Integrations.

Glenn Corvigno
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ABSTRACT

Mr. Corvigno is a Professional Engineer who has been involved in the integration of SCADA systems, for the Water & Wastewater market, since 1972. Currently he is the president of Aaron Associates of Conn. Inc., which is a premier SCADA Integration Company operating through out the Northeast. Through the years Aaron Associates has been responsible for the integration of more than 300 SCADA system projects. Aaron Associates has yearly SCADA system integration sales of more than $3.0M dollars.

Aaron Associates has been integrating SCADA systems into the Water & Wastewater industry for 25 years. As SCADA system Integrators, we have earned our stripes and accordingly we feel the time has come to give something back to this community of SCADA contractors that we embody. During our tenure, Aaron Associates has been able to uncover a few interesting circumstances that continually seem to appear in successfully integrated SCADA projects. These are the same circumstances that almost never appear in unsuccessfully integrated SCADA projects.

Therefore, with posterity at sake; we are presenting a hopefully enlightening and modestly humorous look at (10) reasons that Integrators should clearly see as harbingers of "trouble ahead".

We've tugged, and we've pulled, and we've twisted until we finally condensed these observations into our **(10) Top Reasons for Unsuccessful SCADA system integrations**. Now, whenever you find yourself knee-deep in the integration of a SCADA project and the wheels start falling off….all you'll have to do to get back on the winning track, is to reflect on these (10) pearly observations of SCADA system integration, alter your course accordingly, and B-I-N-G-O. SCADA Integration Heaven.

INTRODUCTION

Ladies and gentlemen… I'd like to begin this morning by thanking you for attending this Water & Wastewater Instrumentation Symposium. It is truly your participation within the ISA that makes all the difference.

The topic we've chosen for today's presentation is of course, "The TOP TEN Reasons for Unsuccessful SCADA system integrations."

Reason #10 **Lack of Commitment by the SCADA Integrator – or – "No way do I have time for all this crap"**

Perseverance, dedication, hard work, continuing self-improvement…….who's got time for all of this? Estimating, purchasing, cash flow projections…….what else can they want from me? Who has time for this?

Well, that's quite an opening salvo. But certainly nothing we haven't all heard spoken at one time or another either by our co-workers or maybe even by ourselves. Our lives have grown terribly complex and it's become harder and harder to shut out the multitude of distractions that continually vie for our attention. So, to preserver we need to not only be aware of our complex lifestyles but we need to address how, as Integrators, we are going to best serve our employers so that every SCADA project we complete, we compete successfully?

In a single word, you're going to do it through your commitment. It will to be your commitment that provides you with the intention and the knowledge that's required to make every one of your SCADA integration projects a success.

Commitment is that thing that develops outside the classroom and away from your scholastic pursuit of the sciences. Commitment is that thing that inspires and ignites ability as it elevates people, circumstances and situations up from the realm of un-impressiveness to heights reserved for engineering marvels. Beginning to sound a little crazy? You haven't heard anything yet!

Commitment as we're describing it here, mandates "No one is, nor should anyone be, more responsible for the success or failure of a SCADA project than the system Integrator. Not the Owner, not the Consulting Engineer, not the General Contractor, not Anyone"!!

It's very rare to come across an Integrator who has the commitment that's required to provide everyone involved in the project with an enjoyable experience. This is to say, a profitable experience as well as an experience that is intensely pleasurable and professionally gratifying to everyone involved. If this sounds somewhat far-fetched (and maybe even a little bit funny) it may be time to adjust your attitude and look at how your projects are turning out. Every aspect of a SCADA system's integration has to be the Integrators responsibility; it's this acceptance that in fact empowers you. How else can one person, one single solitary person, elevate the performance of an entire project team so that collectively they're successful and individually they're gratified?

Time to pay attention because here comes our first revelation: Commitment makes the difference. An Integrator looks better, he feels better and he integrates better when he's developed the commitment that is consistent with someone who takes personal responsibility for all of the project's SCADA integration efforts. Commitment says, "I've got some work to do on Saturday because it's important to the project and I want to get it done". Lack of commitment reminds you how much you hate having to go into work on a Saturday.

It's usually fairly clear, right from the beginning of any SCADA project that; any issues of a technical or contractual nature are going to be the responsibility of the Integrator. When you've got the

proper commitment, it's also fairly clear that; anything-at-all that matters about anything-at-all with respect to the SCADA system, is also going to be Integrator's responsibility.

Ponder this thought. Every SCADA project you get involved in from this day forward turns out to be a project that is immensely successful and leaves everyone involved with a sense of wealth and pride.

So, how do you do it? With this demanding level of achievement and responsibility lofted onto the shoulders of the lowly system Integrator, how can you ever possibly hope to persevere and win the day? Set your sights on what you want to achieve, prepare adequately and allow nothing stand in your way. Commitment.

You know, many people tell me that all this talk about commitment is fine and yeah it's the right thing to do but how will you know when you're doing enough. The answer is very simple. The instant your commitment becomes less than it needs to be; contract specifications become ambiguous and confusing (clearly the work of misguided Consultants), requests made by the General Contractor will become outrageous demands, and the Owner, the Owner's expectations all become totally unrealistic. Lack of Commitment.

Reason #9 **The project was grossly underestimated right from the beginning – or – "How could anybody possibly engineer this system and hope to make it work for that price?"**

There's nothing worse than getting a shinny new SCADA project that is destined to be a loser right from the word GO! Lets face it, estimating is far from an exact science and whenever your established project budget is less than what in fact is required to do the job, you're in for a more difficult time.

As important as any technical issue that presents a challenge to your efforts at hand, so is the issue of getting your project costs in line. It should not be beyond the Integrator's ability to set an aggressively realistic goal intended to minimize any negative project cost exposures.

The best way to work a project back into financial shape is to above all remain service oriented. Find ways of giving, if you in fact have needs to receive.

Intuition and imagination should by no means be discounted when you're project is searching for additional revenues – but – some classically traditional areas you can focus on (at least initially) are material purchases, process enhancements, spare parts and the HMI software effort.

The old cliché that goes, "even though we're losing money on each individual item, we'll make it up on volume", is not something that's going to help you in your endeavors here. What is going to help you is your ability to purchase all of the necessary project materials as economically as possible. This is not intended to mean you should purchase the bare minimum for the least possible cost. What this does suggest, is you should take the necessary time required to evaluate every purchase and make certain that you've selected the best possible materials in as cost-effective a manner as practical. Most often this is achieved through a network of suppliers that you'll rely on and continue to cultivate

throughout your professional career. A network of suppliers that consistently deliver quality cost-effective SCADA products. A network of suppliers willing to work with a good account and extend additional discounts or services in times that require it.

Once you've had a chance to work over, oops, we mean work with your suppliers it's time to turn your attention toward the Owner and any special process needs he may have. Opportunity to improve the bottom line can come from funded scope changes that improve process performance and generally make the Owners life easier. The best way to discover these potential changes is to spend time with the Owner's processes in an effort to uncover the issues and circumstances that present him with his biggest headaches. While you get to know these processes, keep hypothesizing and probing into different process control issues until you feel you've uncovered a sufficient amount of performance control amenities and then offer them up for sale to the Owner. Chances are, the savings he realized from your under priced bid might still be available to him as a means of funding the enhancements.

Opportunity for a financially win-win situation can also be found by trading spare parts for integration services. This exchange can be a viable way to bring relief to a project's stressed bottom line. Trading spare parts for integration services is not only practical for financial reasons but also because spare parts, per se, can be a waste of a SCADA project's funds. Ninety percent of all parts procured and stored as spares on an Owner's site, never get used as intended and eventually get scrapped and discarded.

Another cost improving opportunity available to the Integrator presents itself as a result of the way Engineering firms have been attempting to take responsibility for the SCADA system HMI software configuration effort. Even though there is ample fader for a compelling and vigorous debate over the merits of this industry trend and without meaning any disrespect to the Consulting Engineering profession; there is no debate that a good Integrator will do a superior job configuring and applying SCADA system software, than a good Consulting Engineer will do; for the fundamental reason that the Consulting Engineer will have been sheltered from attaining the level of intimacy required, with respect to the system's hardware components, that the Integrator is compelled to achieve as he goes about his integration efforts. This is to conjecture, that a SCADA system will not be as effective when it's prepared as separate hardware and software entities, as when it's prepared as the entire SCADA system with no means to separate the software from the hardware or the system from its' performance.

A good Integrator prepares, configures, tests, simulates and demonstrates his software for the specific purpose of integrating it with the hardware; then he re-prepares, re-configures, re-tests, re-simulates and re-demonstrates his software until he is convinced that every system hardware nuance has been complemented by it's corresponding software configuration. Now, the only way we know to effectively complement a hardware nuance is to anguish through the calibration and start-up of every system hardware component. If this is in fact the same perspective that a good Consulting Engineer can bring to the task at hand; we would stand corrected. Our point was intended to be that, as an Integrator, if you remain on guard there may be opportunity to recover some necessary project funds by supporting the overall software configuration effort with an infusion of your system hardware performance knowledge.

Nonetheless the bottom line is, the bottom line is your responsibility and the more you can do to improve it, the more you can do to increase your chances for a successful result. Ignore cost or show

irreverence towards it and your chances for an unsuccessful project will increase in a way that can only be detrimental.

Reason #8 **The SCADA system submittals were poorly prepared – or - " I don't know what the hell they want, this spec is terrible"**

"Man oh man, I'd like to know what the heck the Engineer was smoking when he wrote this spec. It's terrible, there's nothing here but boilerplate. I'm going to have to second-guess at everything the specs are asking for."

How many times do we have to hear these comments before it dawns on us that independent of how the specifications have been prepared; with the success of the project established as the Integrator's responsibility, the submittal is your means to that end.

This seems like a no-brainer. Why wouldn't every Integrator submit everything exactly as the project plans and specs call for it? Only for one of the most important reasons that exists between success and failure in the SCADA integration business. And that is; because the successful Integrator knows that the easiest way for any given SCADA integration to be a success, is for his submittal to be the best possible solution for the tasks at hand. It is the Integrators' purpose and responsibility to use the submittal process to evolve the SCADA controls from what the specifications call for, into the system that the Integrator has determined will be the most effective for that given project.

A SCADA submittal should obviously reflect the intentions of the project plans and specifications. But a good SCADA submittal, the type of submittal that every successful Integrator depends on, this submittal will not only reflect the intent of the plans and specifications but it will concurrently place the Engineer and Owner on alert as well. A good submittal will make it vividly clear that the project's SCADA system integration effort has been taken over and the buck now stops with you, the Integrator. A well-prepared submittal will be full of carefully thought out alternative proposals and methods, each intended to enhance some part of the SCADA system's effectiveness, everywhere practical. The result should be alternative methods that open the door to cost effective choices, which in turn results in an overall better SCADA system.

Contrary to what some of you may be thinking at this point, a submittals preparation should first and foremost be for the benefit of the Integrator and not the Engineer. Obviously it has to stand the scrutiny of the Engineer's approval process but more importantly it has to stand the scrutiny of the Integrators approval process.

Any Integrator that takes the time to prepare a SCADA submittal should feel 110% committed to its proposed methods of control and integration. We're not talking here about good submittal practices such as precise detail, relevant data or clear easy to follow presentation – no – what we're talking about is preparing the submittal so that it provides the Integrator with all of the detail and information necessary for him to do his job successfully.

The submittal process is where the successful Integrator takes advantage of the opportunity given to him, which is to provide the best possible SCADA solution for the project at hand.

Reason #7 **Submittals are returned APPROVED w/ no comments – or – "Wow, I submitted everything perfectly. Hellooooo clear sailing"**

A sure way to be unsuccessful in the integration of a SCADA system would be to interpret an approved submittal that didn't have a single comment or notation on it, as a ringing endorsement of your engineering efforts. Unless you're physic, there is no way to be successful in the controls business without feedback. (Pun, intended) The submittal process is no different; a submittal only gets better with feedback. Submittals should never be engineered as static entities designed to stand solely on their volumous merits; submittals need to be interactive to be their most effective. Submittals have to be discussed; they have to be alternative and intended to solicit comment.

If the Integrator doesn't take time to meet with the Engineer to discuss his SCADA submittal he's guilty of doing everyone a disservice, as well as adding additional cost to the project and reducing the project's overall chances for success.

The usefulness of a submittal is directly proportional to how useful it is. (We love being able to arbitrarily make comments like this!) A submittal will be less effective and of less use, if the Integrator has not had an opportunity to review it with the Engineer. These submittal review sessions are the perfect forum to exchange ideas about the SCADA system at a time when every intention or interpretation is at its most supple and cost effective. Integrators need to take more advantage of the submittal process to insure that the most relevant aspects of the SCADA system have all been presented in a manner that affords proper review, discussion and resolution.

Once you've had an opportunity to discuss the submittal with the Engineer, you're left with the task of integrating his comments into what will become your final re-submittal document. It is this integration of the Engineers comments into the Integrators original submittal document where the transformation begins, the transformation of the submittal from simply useful to SUPER-SUBMITTAL, the single most comprehensive project document that defines the SCADA system and sets it squarely on the path towards successful integration.

You know, I think you caught me speeding just a little bit, we all know there's no such thing as a SUPER-SUBMITTAL. There's no such document that can be engineered to contain everything that would be required to insure the successful integration of a SCADA system. That's crazy! I mean isn't it? Isn't it too much to ask for???? Well, not if you're serious about what is that you want to accomplish. Not if you're serious about making certain that your SCADA projects are going to stand apart from others. When you get to this point, the SUPER-SUBMITTAL will be a must. You'll have to have it. You can't consistently complete SCADA projects successfully without it. The SUPER-SUBMITTAL.

Reason #6 **The SCADA system doesn't come together well - or - "It was the electrical and mechanical contractors that screwed everything up"**

Every municipal project of any consequence will most likely go to the lowest bidder. This helps to insure that the Integrator will have no control over who is selected to handle the electrical and mechanical aspects of the SCADA systems integration. Therefore, if an Integrator does not feel the

compulsion to go out of his way and establish a rapport with the electrical and mechanical contractors, he's leaving the door open to a SCADA system installation that will be compromised, at best.

The contract plans and specifications are certainly a source of standards and usually provide some detail with respect to the installation of most SCADA system components. But they could never suffice in place of an Integrator who takes the time to address the proper and acceptable installation of each system component with the electrical and mechanical contractors. The best way to insure that the SCADA system components are installed to the Integrator's satisfaction is to prepare your submittal with the understanding that they won't be, and then spend your efforts preparing the submittal, accordingly. That is, to create a document specifically detailing every aspect of each instrument's electrical and mechanical installation as you've determined appropriate for the project. Then, to take the time necessary to present and review this information with the electrical and mechanical contractors.

Even though, the electrical and mechanical contractors are agents of the General Contractor, it's the successful Integrator who gains their respect and exemplifies himself into a position of authority when it comes to directing project SCADA installation efforts.

It is no longer acceptable for an Integrator to use the excuse that the electrical or mechanical contractor did a lousy job. Every contracting firm has a pool of what we can label good and bad talent. It's the Integrators responsibility to seek out whoever these individuals are and to insure that they follow his installation instructions properly.

Checking in on the electrical and mechanical installation, as it's taking place, will help to insure that you get what you want with a minimum of wasted effort. The Integrator that waits for all of the instruments to be installed and powered up before he sees fit to visit the site for the first time can be making a very expensive mistake. Especially, if everything you took your time to discuss and review with Mario never quite filtered down to Louie, who actually did the installation. His way!

Depending on the efforts of others places the SCADA system in a vulnerable position if everyone isn't working together. Therefore this seems like the appropriate time to speak a little bit about teamwork. Everyone pulling together and working together toward a common goal. Nowhere it is more important than in the combined efforts of the projects sub-contractors. Appealing to everyone's sense of teamwork can be an effective means of getting the results you need. Everyone benefits when you take the responsibility for the proper installation of the SCADA system components.

Reason #5 **Ineffective or marginal calibration and start-up efforts – or – "This is the 5th time I'm calibrating that damn flow meter"**

Finally we get an opportunity to discuss a real SCADA system integration saboteur; the instrumentation calibration and system start-up effort.

Very seldom, does a project evolve conveniently into the calibration and start-up phase. Often instruments have to be calibrated in a piecemeal fashion and many times without the benefit of ever actually seeing them function in their particular application. This is to suggest that pumps may not be able to be started or valves may not be able to be opened and consequently the flow meter you spent your time statically calibrating, will never have had an opportunity to actually see flow. Without

actually witnessing the instrument in use, an Integrator should not try holding his breath when it comes time to demonstrate a flow type control loop.

A SCADA system that is predicated on instruments which have not been properly calibrated and exercised or that appear to exhibit operational inconsistencies, is of no use to anyone. The groundwork required to prevent the ineffective start-up of a SCADA system ripples though every activity the Integrator performs.

How reverent was he in his selection of system components during the submittal process? Did he take the time to closely examine and compare each instrument for its intended application? Is he confident his selection of instrumentation will achieve the intended results? Were the installation details well thought out and specific for the particular applications? Essentially, how well did the Integrator prepare for a successful instrumentation calibration and start-up of the SCADA system? The successful start–up of any SCADA system will be tremendously influenced by the amount of time that is spent in preparation of the pending instrumentation calibration and start-up effort.

Problems easily get out of hand during the start-up phase of a SCADA system's integration, and one of the best ways to prevent this from happening is to minimize their occurrence by preparing for them right from the very beginning.

Of course, any start-up effort will progress more smoothly if there is an instrumentation calibration and start-up plan that's in place. A plan that consists of Engineer approved procedures with checklists and signoffs that sufficiently document calibration details and performance specifics for each instrument. Every set of contract specifications will address the start-up plan and the methods intended for acceptance of the system. What they won't tell you about the instrumentation calibration and start-up plan is, that it better be on your mind early and in spite of what the specifications consider acceptable, it better be your best attempt.

Here are a few ideas that may help you during your next start-up and calibration endeavor:

1. Address start-up and calibration before you ever even consider purchasing an instrument. Make the issue of start-up and calibration as important as that of instrument cost and reliability.
2. Solicit the manufacturer's local sales or service representative to visit the project site and inspect each instrument's installation with you.
3. Know how and who to get in telephone contact with, from the manufacturer's in-house product support team. Contact them in advance of any scheduled start-up or calibration effort to make certain they're aware of who you are and what you're trying to do. Also make certain they'll be available to you while you're in the field, if in fact you do need their support.
4. Throw a digital camera into your tool bag and start to include more pictures as a means of explaining instrumentation issues during start-up time.
5. Having to re-visit an instrument five times is certainly going to hinder the success of most start-up efforts, but re-visiting a particular instrument on a different day, can often prove to be beneficial if your efforts have been resulting in frustration and confusion. Solutions sometimes incubate at deep levels and a fresh next day perspective could be all that is actually required.

6. Best attempts are usually made when the Integrator has sufficient time for all of the tasks at hand. Time constraints can make the simplest start-up problem overbearing so it's important that you have the time you need and that you use that time most effectively.
7. Most important. Prepare – prepare – prepare. Test – test – test.

Reason #4 **Inability to ever get the SCADA system accepted – or – "The commissioning team doesn't know their amps from an ohm in the ground"**

One thing for sure; you'll never be finished with a project until you get the SCADA system signed-off and accepted. Sometimes, not even then.

There can be a number of reasons why a SCADA system commissioning effort is unsuccessful. But primarily, they're unsuccessful because there are too many uncoordinated activities happening too quickly and the commissioning team has not been adequately prepared.

It always helps to keep things familiar when you're trying to impress someone. It benefits everyone when the Integrator composes a plan from documents that are already familiar to key individuals on the commissioning team. The contract P&ID drawings, the submitted loop drawings, the results of previous FAT demonstrations and any project specific issues should all be an integral part of the commissioning plan. Certainly it helps if the plan was reviewed with the commissioning team in advance of any testing and acceptable results were discussed. The Integrator should try and keep things familiar to everyone and he should move in steps that are fundamentally sound and reassuring to the commissioning team.

Now comes the real secret, the one that's been hidden away from view and learks behind the scenes of successful commissioning efforts; test and exercise the system extensively before you demonstrate it. Not just a wham, bam, thank you Sam, type of testing but a type of testing that is thorough and complete. A type of testing that bonds the Integrator to every aspect of a SCADA systems controls. A type of testing that burns the Integrators fingertips sufficiently enough to insure that the only conclusion the commissioning team can come up with is an acceptable one. (GOD, we love making these statements sound so profound!)

Invariably, a commissioning team will accept the SCADA system based not only on the performance of the commissioning effort but also on the confidence the Integrator exhibits during all aspects of the test. If an Integrator fumbles through a commissioning effort, he has no one but himself to hold accountable for a commissioning team that is hostile because demonstrations and results are less than acceptable. It is not so much the commissioning team's responsibility to accept a SCADA system, as it is the Integrator's responsibility to demonstrate a system that the commissioning team can accept.

If it takes more of your efforts and time to manipulate process circumstances for an accurate and effective commissioning of a SCADA system, then so be it. A successful Integrator needs to stay immersed in the knowledge that good results are the result of time spent testing the process. Nothing is as effective in the commissioning of a SCADA system as an Integrator who exhibits confidence in the wake of every potentially debilitating process situation. An Integrator the commissioning team can place their confidence in.

Reason #3 **Plant operators are afraid to use the new SCADA system – or – "The operators are afraid to use the new SCADA system"**

How many times have you heard this one? "The computer's all screwed up. We didn't even touch it and it like went crazy. Plus, we told the guy that we wanted a switch that would put everything back into manual when this happens".

Actually, this has gotten to be a very old cliché because in truth, computer systems have emerged and gained the industry's trust and acceptance as a viable way to control facility processes. What used to be the previously menacing problem of trying to get an operator to place his trust in the new computer system has already been greatly tempered for you. Essentially no one will object to a new SCADA system based solely on the fact that it's a computer. Lets make sure we keep things this way.

The real issue at hand, the one that appears to rub an operator the wrong way is that no one may have taken sufficient time to educate the operator properly about the SCADA system. He feels alienated and acts accordingly. But is it your place to have to baby sit him just to make sure his feeling aren't hurt? You already know what we're going to say. You're betting the success of the project on it!

An Integrator can never hope to be successful with out striving to improve on his ability to teach and inspire. In the business of SCADA system integration this translates into involving the operator early and earnestly. It's a mistake to program a SCADA system without first having reviewed each of the process control loops with the plant operator. The Integrator needs to spend time identifying those things that present the operator with his biggest headaches and then specifically addressing them on behalf of the operator. The Integrator needs to remember to integrate the operator into the SCADA system and make him feel as important as he in fact will need to be. The Integrator should solicit the operator's opinion on various instrumentation installation issues like location, accessibility and maintainability. The operator should also be involved during the calibration and set-up of the process transmitters and analyzers. Involvement is a key.

The operator needs to be made comfortable and confident with whatever interactions he'll be required to perform to render the SCADA system effective.

Reason #2 **Everybody bickers and work comes to a halt – or – "I'll show those bastards they can't treat me this way"**

It is not uncommon for a Water Treatment Plant construction project to be comprised of a stubborn and demanding personality or two. There may even be more than one or two. Nonetheless, if these personalities are allowed to influence your integration efforts, your decisions concerning the SCADA system are being made on emotion and that's not good.

If anticipated project payments, from the General Contractor to the Integrator, begin running slow and placing pressure on the Integrators cash flow and payables accounts; and if consequently the Integrator sees fit to hold up doing anymore work on the SCADA system until he gets paid, that's not good.

If the Engineer makes an "It doesn't matter what the spec says, you have to provide it anyway" type ruling against the SCADA system Integrator and the Integrator chooses to dig in and go to war over the issue, that's not good.

All of these scenarios have sufficient leg to render a SCADA system integration unsuccessful. And not for nothing, they can all seem like very good reasons if they're happening on one your projects. So how can you resolve issues like these that would sabotage a project and bring it crumbling to a screeching halt?

Never start a project without the knowledge that your best effort will always be made by completing the project and never by holding up the project. Under no circumstances should an Integrator ever hold up a project. It will only take whatever was a bad situation and make it worse. As unbearable as a situation may appear, it will be better served when the emotion gives way to reason and all of the necessary parties work together.

So, how do you move forward when personalities conflict, or project payments are late, or the Engineer becomes unreasonable? You find a way. You work through it and you move on. It might require a change in your attitude or your approach to project issues, but you find a way. Yours may even need to be an assessment of your own life style. How is your family life working out for you? Are your children well adjusted and providing you a source of comfort amid all of life's turmoil? Is there time in your day to bring your spirit in balance with your purpose? You find a way. Sometimes it's as simple as calming your emotions, resting your attention on a solution and allowing your natural ability to let you step forward and out of the chaos.

Inherently, SCADA project problems can begin for any reason. But, usually they become problems because they are overbearing issues and they need to be broken down to be resolved in a meaningful manner. Don't be so rigid in your approach to any project impasse. Always, remain flexible. People will listen to explanations that have merit. If your position is supported with common sense and sound practices, it is immeasurably easier to proceed whenever you're being challenged. It will be much easier to alienate your constituents, if your principles are sound and just plain make sense.

Reason #1 **Lack of Commitment by the Integrator – or –**
"Hey! This guy's cheating us, that was Reason #10"

All of the reasons we've presented, for unsuccessful SCADA system integration efforts are legitimate issues and hopefully we've amused your interest in our presentation of them. But by no means can we examine these (10) reasons and think that we've done anything but scratch the surface. The game is still as they say; "a foot" and you'll need to be aware of so much more. You'll have to be capable of so much more. How are you planning to do it? What magical power are you going to tap into, that's going to make you capable in every endeavor? Commitment, maybe?

Feeling good about your health? How's your social life? Your golf game? My guess is they're all a reflection of the commitment you give to them. Get your priorities in order and then get on about the business of successful SCADA integration and do so with a re-newed commitment. Do so with a commitment that sustains you through everything imaginable and everything unimaginable. "Relevant"

doesn't take a back set to "petty" when either of them are the reason for a SCADA system's integration to be unsuccessful.

Every project looks better architecturally, structurally, mechanically, electrically, and everywaylly when the SCADA system provides the Owner with effective process control.

You're continually faced with choosing between good and bad or right and wrong. How do you do the good thing? How do you make the right choice? You do it by performing at your best, by preparing properly, by inspiring others to follow you and by committing yourself to nothing less than a successful endeavor. You go on a 6-month campaign and re-commit yourself to the values of successful integration. You know that nothing is as important as the entirety of the end product.

You've been afforded an opportunity, an opportunity that allows good people to do good things. This is really how success is achieved; good people commit themselves to make a difference, and they make the journey a pleasurable one for everybody. Does this sound like you and your projects?

The SCADA integration business is special. It's like no other part of the construction effort that goes on around it because nothing else has quite the impact that an effective SCADA system can have. Finally, we'd like to reveal the last quality that successful Integrators all seem to have in common, and it is this: they all have a passion and a love for their purpose that exemplifies itself in everything they do. Their commitment is not just to successful SCADA integration, their commitment is to success in life and they illustrate it in everything they do. In closing we entrust to you Good Life and Good Engineering. Thank you.

Water & Wastewater Division

WWID 2012 SCHOLARSHIP AWARD

The ISA's WWID is committed to encourage youth into higher education by offering two annual one-thousand dollar ($1000.00) scholarships to qualifying candidates. The winners will be selected by a lottery chance in February of 2012. All eligible candidates and their application forms will be reviewed by the Scholarship Chairman before the drawing and must meet the following requirements.

1. Applicant must have a parent who is an ISA WWID active member, be a WWID member or must be an ISA WWID Student member. The member must be in good standing with the ISA WWID, I.E., dues paid to date.
2. The candidate must be enrolled as a full-time student in the spring semester at a two or four year institute of higher learning and he or she must have completed the previous semester as a full-time student.
3. To be considered for the ISA WWID Scholarship Award, the application form must be filled out completely and mailed to:
   Michael B. Fedenyszen
   ISA WWID Scholarship Chairman
   60 Whittier Street
   Haverhill, MA 01830 USA
4. Application forms must be received by the WWID Scholarship Chairman no later than January 31, 2012.

For more information applicants are referred to the "WWID 2012 Scholarship Program Details and Applicant Rules" and "WWID 2012 SCHOLARSHIP APPLICATION."
Visit us at www.isa.org/wwid for additional information regarding the Water and Wastewater Industries Division and its scholarship program.

WWID 2012 Scholarship Program Details and Applicant Rules

- Two student scholarships will be awarded, each valued at $1000.00 USD.
- An applicants may be a son or daughter of a WWID member, a WWID member, or an ISA Student WWID member.
- The WWID member must be in good standing with ISA, I.E., dues paid to date.
- Applicants must be enrolled in a 2-4 year program or advanced degree program, at a university or institute of higher learning and must have completed the previous semester as a full-time student.
- The program of study that the applicant is enrolled does not factor into the award.
- The application form will be made available in October of 2011 for the 2012 awards.
- Application deadline is January 31, 2012.
- There are no applicant evaluation criteria other than assuring that the application form is correctly filled out.
- The winners are drawn at random by the WWID Scholarship committee in February, 2012.
- The winners will be notified by the Scholarship Chairman before February 28 via telephone and email in March.
- Winners are required to submit a digital photo plus a 100-200 word bio that is suitable for publication.
- Scholarship monies will be distributed in April after receipt of photo and bio, and will either be mailed directly to the winner(s) or mailed to the school at the discretion of the scholarship chairman.

Setting the Standard for Automation™

Water & Wastewater Division

WWID 2012 SCHOLARSHIP APPLICATION

Student Name: _____
Address _____
Home Phone: _____
Student E-mail: _____

Institute Name: _____
Institute Address: _____
Institute Phone: _____
Dean of Admission's Name: _____

Parent Name: _____
Parent Address: _____
_____
Parent Phone: _____
Parent E-mail: _____

ISA Membership Number: _____
(Parent or Student)

Parent information above may be omitted if the applicant is an ISA WWID Student member.

Forward application to:
Michael Fedenyszen
WWID Scholarship Chairman
60 Whittier Street
Haverhill, MA 01830 USA

APPLICATION DEADLINE IS JANUARY 31, 2012