Water / Wastewater Industry Division

Setting the Standard for Automation™

Calendar of WWID Events

Dc 15, 2021	**WWID Connect Live** (online meeting) 2021 Summary & 2022 Plan
Jan-Dec 2022	**WWID Connect Live virtual events** Dates TBD
Jun 12-15, 2022	AWWA ACE 2022
Summer 2022	**2022 Energy and Water Automation Conference (EWAC)** Dates and Format TBD
Oct 8-12, 2022	WEF WEFTEC 2022

In this Issue:

Newsletter
Summer / Fall 2021

Director's Welcome

Manoj Yegnaraman, Carollo Engineers Inc.

Welcome to the Summer/Fall 2021 edition of our WWID Newsletter. I hope you and your families have been doing well and staying safe.

As a refresher, our WWID Vision is to serve as a valuable automation resource for our Water and Wastewater Industry. And our WWID Mission is to provide such valuable information to our WWID members via various communication platforms. We are making constant efforts on our mission to reach our objectives, and I hope our ISA WWID members feel like they receive the membership values.

There have been three major Division accomplishments since our last newsletter update – EWAC webinars, MOU with WEF, and Engagement with AWWA.

The EWAC team (WWID: Hassan Ajami, Jon Grant, and Joe Provenzano, along with POWID volunteers and ISA staff) conducted multiple technical webinars, spread across 3 days (Jun 30, Jul 20, and Aug 3). The topics ranged from Control system obsolescence, remote access, project management, self-serve analytics, ISA112 SCADA standard, SAE, and cybersecurity. The webinars were well received because of the involvement of best speakers in the industry, high quality presentations/panel discussions, combined with the Q&A session at the end of each webinar. This concludes the EWAC webinar series for 2021. The WWID… **(continued on page 2)**

Newsletter Editor's Welcome

Graham Nasby, City of Guelph Water Services

Welcome to our Summer/Fall 2021 newsletter! This has been an unusual year for us ISA volunteers, with no in-person ISA events to attend. With the current Covid-19 pandemic, every committee meeting I have attended this year has been virtual. While it has allowed for much wider participation than in the past (as there are no travel arrangements to be made!), I am looking forward to us being able to get back to doing in-person events. With the year 2022 just around the corner, I'm hoping that by Fall 2022 we can again get a chance to meet each other face to face.

With all of this said, the WWID committee has been hard at work in 2021 to provide a web-based programming. Our Energy and Water Automation Conference team has provided a wide range of virtual webinars on a variety of topics. Attendance has been very good, with our recent cybersecurity webinar attracting over 450 attendees.

On top of this we have also held several ISA Connect Live events, which have involved speakers facilitating online discussion rooms on a variety of automation and SCADA optics. For myself, I enjoyed giving an introductory talk and Q&A session about the work of the ISA112 SCADA Systems standards committee, which I co-chair along with Ian Verhappen. If you have not yet downloaded a copy of the ISA112 SCADA system management lifecycle, I encourage you to visit www.isa.org/isa112 and **(continued on page 2)**

WWID Director's Message
(continued from Page 1)

…will soon start discussions with ISA to plan 2022 Conference and Event opportunities for our division.

I am excited to announce that WWID entered into a Memorandum of Understanding (MOU) with the Water Environment Federation (WEF) in Summer 2021. WEF and ISA WWID have been supporting each other for the past several years, and I am so glad that we are able to continue this partnership this year as well. With this MOU, there are several opportunities for each organization to support one another in terms of technical programs and events. WEF is global leading association for the Wastewater Industry, and this collaboration allows us to be up to date on the current trends such as challenges, technologies, and solutions. And as a result, we are able to immediately plan the automation aspects for those current trends. I want to take this opportunity to thank WEF (led by Barry Liner) and all ISA staff for making this happen for WWID this year.

Similarly, we have been in communication with AWWA to understand the advancements and challenges for the Water Industry. With the assistance of Kevin Morley with AWWA, we are looking into the US President's Executive Order 14028 on "Improving the Nation's Cybersecurity". The EO calls for NIST's involvement on a variety of initiatives. NIST has made a lot of progress, and ISA has already commented on the initiatives' preliminary documents. At WWID, we believe that it is of utmost importance to keep our members up to date on this timeline and progress. We are actively working with Kevin to come up with a plan to communicate with our WWID members on this important topic. I thank Kevin for his continued support to our Division.

Board Member update - I'm so happy to let you know that our long time WWID volunteer, Jason Hamlin, accepted a WWID Board member position. He is a member of our program committee and has also presented and participated in multiple WWID symposiums in the past. It's an honor for us to have Jason be a part of our team.

I want to thank you for your support and participation towards ISA/WWID membership and activities. If you have ideas that you would like to discuss or share with our Industry/Division, please an email to one of our Board Members (contact information can be found at the last page of each newsletter).

Manoj Yegnaraman, PE
2021-2022 Director, ISA WWID
Associate VP, Carollo Engineers Inc.
myegnaraman@carollo.com

Newsletter Editor's Welcome
(continued from Page 1)

…download a PDF copy of the current ISA112 SCADA system management lifecycle diagram at no cost.

The year 2021 has also been a year of change for ISA. In May 2021, ISA's current Executive Director Mary Ramsay announced her intent to retire at the end of the year. Starting on November 1, 2021, Claire Ramspeak will taking on the position of ISA's new society-level Executive Director. Claire brings over 25 years of leading technical associations that are involved with standards, education, training and member services. She also has extensive volunteer experience from serving on boards and committees for ANSI (American National Standards Institute) and UL (Underwriters Laboratories).

The ISA also undertook a review and reorganization of how it organizes its local sections into geographic districts. On January 1, 2022, ISA will be transitioning from 14 to 8 geographic districts. The re-districting is to better align with recent changes in where ISA sections are now located.

Lastly, we will be also seeing some turn-over in the volunteer Vice-Presidents who oversee ISA's technical divisions. Brad Carlberg will be ending his 2020-2021 term as VP of Industries & Sciences, and Xinsheng Lou will be our new incoming 2022-2023 VP of I&S. We are all looking forward to working with Xinsheng.

Graham Nasby, P.Eng.
WWID Newsletter Editor
graham.nasby@guelph.ca

WELCOME

Director Elect's Welcome

Hassan Ajami, PCI-Vetrix

Hello to all of our WWID members! As we all ride the Covid rollercoaster, we can't lose focus on our normal day-to-day lives and activities. Hopefully everyone was able to enjoy their summer, or winter for those in the Southern hemisphere.

This year has been a constant battle with change. Covid, cyber hacks, weather patterns – nothing is like it was in the past. While Covid is not under control, we've found ways to work around it through remote work, proper PPE, vaccinations, and health checks. We must continue to do so until infections and transmission rates drop below the "herd immunity" threshold.

Cyber hacks are nothing new, since the early days of connecting devices to the outside world, hackers have tried and found ways to get into systems. More recent events, coupled with the worldwide economic downturn, have pivoted towards financial gains with hackers shutting down entire systems for ransom. A few events have shown that hacks can take on a dangerous turn with hackers making changes to treatment processes that could have impacted entire communities. These are the threats that we, as an industry, must protect against. WWID is working within ISA and with other industry groups to better understand the new federal requirements and their impacts on the W/WW industry. We will keep our membership updated throughout via posting on ISA Connect, LinkedIn and ConnectLive technical discussions.

The final change, which has hit close to home for me multiple times this year, has been climate change. I'm in the Great Lakes area and this year has been the wettest that I can recall. Downpours of several inches of rain over short periods overwhelmed the local wastewater networks and caused flooding. Regulations to combat or turn back our impacts on the climate are one thing, but the flooding has revealed that our infrastructure is in need of work. What was the norm 50+ years ago when many of these systems were built no longer applies. Greenspaces have been taken over by development, rivers and streams have been rerouted or minimized, and what used to be natural flood plains are now full of housing. Changes to our infrastructure are needed to update older systems, just as they are needed to protect against cyber threats.

As we now approach year end and the kids are now back to school, I implore everyone to stay safe and do all that you can to protect yourselves and your loved ones.

Hassan Ajami, PE, CAP
2021-2022 Director-Elect, ISA WWID
2021-2022 General Chair, ISA EWAC
Vice President / Lead Technical Officer
hajami@pci-vetrix.com

WWID NEWS

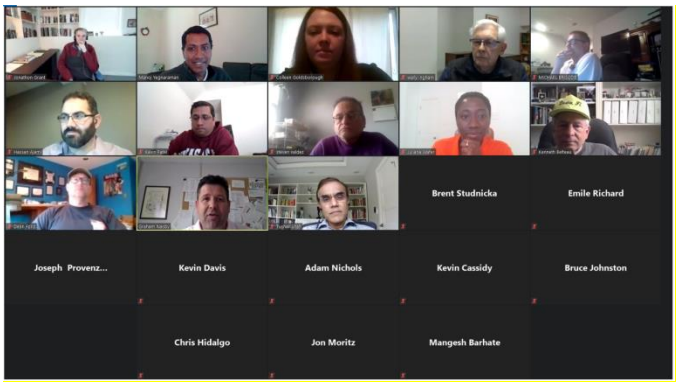
450 Attendees tune into ISA Water-Wastewater SCADA Cybersecurity webinar

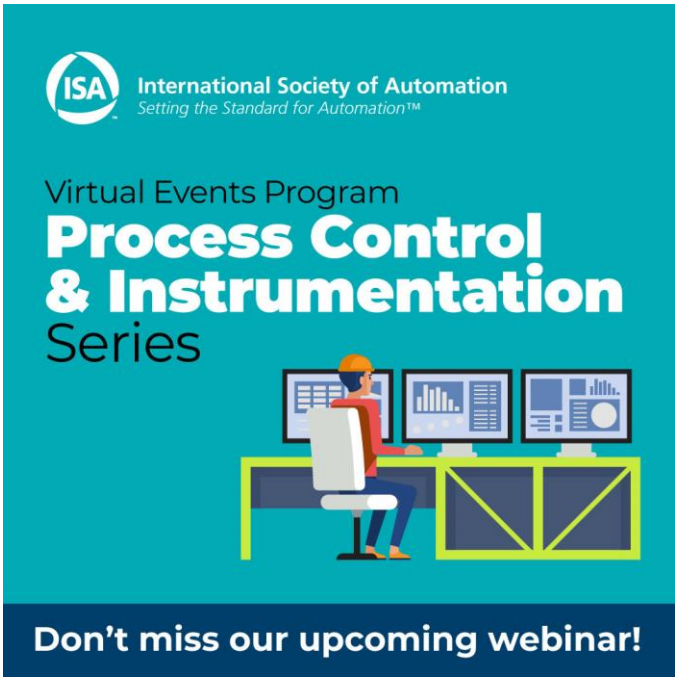
From the WWID committee

On August 3, 2021, the ISA Water/Wastewater division hosted a webinar on SCADA cybersecurity best practices as part of the ISA Energy & Water Automation Conference (EWAC) series of technical webinars.

Featuring speakers from the SANS Institute, Dragos, OT Sec and DirectDefence, the event has over 450 attendees from around the world. Attendees got to listened to presentations from Tim Conway from the SANS Institute, Gus Serino from Dragos, Andrew Hildick-Smith from OT Sec, and Christopher Walcutt from DirectDefense. The event itself was moderated by the WWID's very own Jon Grant, who is part of DirectDefense. Thanks to everyone who attended.

Thank you to our dedicated EWAC program committee volunteers and our ISA staff contact Kim Belinsky for arranging for this year 2021 virtual technical presentations.





WWID NEWS

Joe Provenzano receives 2021 ISA society-level Excellence in Enduring Service Award

By Pavol Segedy, WWID Honors and Awards Chair

The ISA Water/Wastewater Division is pleased to report that long-time ISA volunteer leader Joe Provenzano will be receiving the 2021 ISA society-level "Excellence in Enduring Service" award as part of a virtual awards ceremony in fall 2021. Joe has been active in the ISA Water/Wastewater Division for over 50 years, and held many roles during that time. For the past 10 years, Joe has served as the Program Committee Chair for the WWID.

Joe Provenzano
Principal Consultant
KPRO Engineering Services
Naugatuck, Connecticut, USA

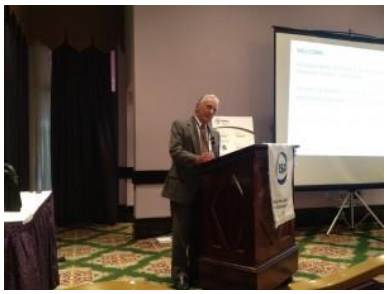
Please join us in congratulating Joe Provenzano for the award and thanking him for his many years of service. www.isa.org/members-corner/isa-honors-and-awards

About the Excellence in Enduring Service Award

The ISA Excellence in Enduring Service aware is awarded to a volunteer member with a minimum of 15 years of continuous service in a leadership position(s) within the society. The award recognizes dedicated volunteer service to the Society at the grassroots level.

About Joe Provenzano

Since the start of his career in 1957, Joe has been involved in the automation, instrumentation and control sector for over 50 years. He has worked in companies large and small, and been involved in positions ranging from hands-on technical roles to being part of executive management teams.



Joe speaking at an ISA water/wastewater conference

He has been an active ISA member for over 20 years, holding positions throughout the organization that include officer-level roles at the section, district, division, and society levels as well as being involved with standards committee work. He was also one of the key organizers of the first ISA Water/Wastewater and Automatic Controls Symposium which took place in 2003, and has been heavily involved with the symposium ever since.

Joe began his career in 1957 when he graduated with an Electrical Technology Associates Degree from Brooklyn Community College located New York City. His first job out of school was with Sperry Gyroscope where he started as an electronics test technician. He moved up through the ranks and was soon managing one of their electronics groups. While working at Sperry he completed courses at Adelphi University and graduated June 1965 with a degree in Applied Physics. In October of 1965 Joe got married.

Towards the end of 1965, Joe joined ITT WorldComm in their downtown New York City office for a 7-month project where he designed ship-to-shore electronics. After that project was complete, he took a permanent position in with Data Master Inc. a division of the Bristol Company in their Long Island NY facility. In 1966 he bought his first home in Long Island New York.

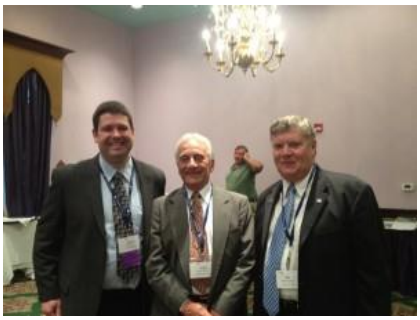
Joe went on to have a 29 year career with Bristol where he worked on a variety of projects. In 1983 Joe became VP of Systems Engineering. He was one of the key people involved in the development of the Bristol-Babcock RTU-3350, and RTU 3380. These RTU's were then integrated into Bristol's Network 3000 Distributed control System. (the RTU's preceded RTU-3330 that many of us are familiar with). During his time at Bristol, Joe was one of the key people who supervised many of the larger and complex system integration projects that the systems group undertook. While at Bristol, Joe also completed a Masters in Computer Science from the Pratt Institute located in Brooklyn New York in 1970.

In 1994, Joe left Bristol to take position of General Manager with Aaron Associates, a Connecticut-based System Integration firm. As part of AA, he helped build the company form a small firm to one with over $4million/year in revenue.

In 2009, Joe left Aaron Associates and joined Process and Energy Measurement Corp. that same year. As part of PEMO, Joe moved into the role of Environmental Specialist working at the plant level in Connecticut.

Joe has recently embarked on a new venture with a firm called KPRO Engineering Services LLC. The company will provide Instrumentation, and Engineering services to Contractors serving the Water and Wastewater Industry.

Joe has been active with the ISA Water/Wastewater Division the 1970s.



Joe Provenzano (center) with Graham Nasby (left) and 2012 ISA Society-President Bob Lindeman (right)

WWID SCHOLARSHIPS

2022 WWID Scholarship Applications

By Kevin Patel, WWID Scholarship Chair

The ISA Water/Wastewater Industry Division (WWID) is pleased to announce our 2022 ISA WWID Michael Fedenyszen Memorial Student Scholarship. The scholarship is named to honor the contributions of long-time WWID volunteer Michael Fedenyszen who passed away in 2017.

Eligible students can win up to $2000 USD in scholarship money to help them pursue higher education.

Students can apply by filling out the application form, accompanied by:

- 200-word essay on why they should win
- a copy of their academic transcript
- confirmation of enrollment form/letter

The application deadline is January 31, 2022

The division is pleased to continue to provide up to $2000 of scholarship money to encourage WWID members and their sons/daughters to pursue higher education. In addition, winners will receive a complementary 2-year student ISA membership.

Applications are due by email by January 31, 2022. Winners will be notified by February 28, 2022 via telephone and email. Winners will be required to provide a photo and short biography that can be used for publicity reasons. Scholarship money will be distributed by check and mailed after the winner is contacted and has supplied the required photo/bio.

Scholarships will be awarded at the sole discretion of the WWID scholarship committee, with preference being given to students enrolled in technical programs that lead to careers in the water/wastewater sector.

Download and view the student scholarship application form at www.isawaterwastewater.com or our online ISA Connect community at www.isa.org/wwid .

Please email completed application form, along with 200 word essay, confirmation of enrollment and copy of academic transcript to:

scholarship@isawwsymposium.com
AND
knpatel@sig-auto.com

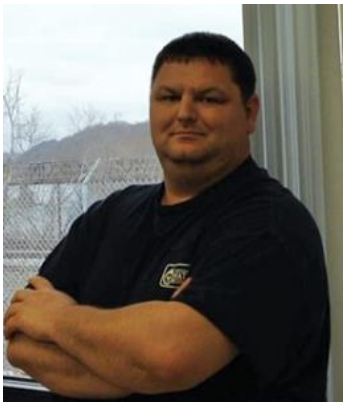
All applications must be submitted by email (PDF scans of documents). Please do not send submissions by postal mail.

ISA Water/Wastewater Industry Division

WWID SCHOLARSHIPS

Welcoming our newest ISA WWID Volunteer: Jason Hamlin

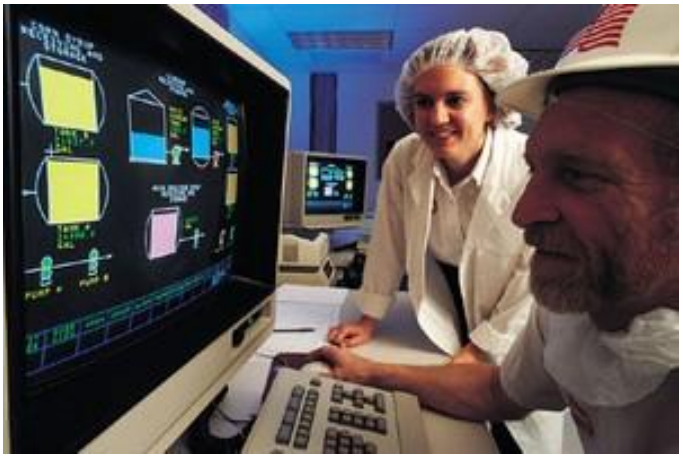
From the WWID Committee



Please welcome our newest volunteer leader: Jason Hamlin, who is based out of Lynchburg, Virginia, USA.

Jason has been involved with our Water/Wastewater conferences for several years, as both a presenter and program committee member.

Jason is the Operations Manager for Instrulogic, and is based out of their Winchester, Virginia, USA office.



Setting the Standard for Automation™

Water & Wastewater Division

2022 WWID Michael Fedenyszen Memorial Scholarship

APPLICATION FORM

The ISA Water & Wastewater Division (WWID) is pleased to award up to $2000 of scholarship money to encourage WWID members and their sons/daughters to pursue higher education. Students recommended by a WWID member may also apply. Winners will also receive a complementary 2-year student ISA membership, which includes a print subscription to ISA *InTech* magazine. Applications will be accepted via email through January 31, 2022. Winners will be notified by February 28, 2022 via telephone and email, and will be required to provide a digital photo, a 3-4 sentence biography, and a 1-2 sentence "thank you note" that can be quoted for publicity purposes. Scholarships will be dispersed by check and mailed after the winners are selected and the required documentation is received. Scholarships will be awarded at the sole discretion of the WWID scholarship committee with preference being given to students enrolled in technical programs that lead to careers in the water/wastewater industry.

Eligibility (check one)

- ☐ WWID member, ISA Member # _____
- ☐ WWID student member, ISA Member # _____
- ☐ Parent/Guardian is a WWID member, Parent Name: _____ & ISA Member # _____
- ☐ WWID member recommendation (letter attached), Member Name: _____ & ISA Member # _____

Other criteria (check off each one)

- ☐ Currently attending 2-4 year university/college curriculum
- ☐ Confirmation of enrollment letter (or scan of student card) attached
- ☐ 200 word essay about "Why I should win the scholarship" attached
- ☐ Copy of previous year's academic transcript attached

Applicant's Name: _____
Program of Study: _____
Institute Name: _____
Institute Address: _____
Dean of Admissions Name: _____
Institute Phone: _____

Address While At School

Street: _____Apt. _____
City: _____
State: _____
Zip Code: _____ Country:_____
Phone: _____
eMail: _____

Home Address

Street: _____Apt. _____
City: _____
State: _____
Zip Code: _____ Country:_____
Phone: _____
eMail: _____

Applications must be submitted as scanned PDFs and emailed to the scholarship committee at:
scholarship@isawaterwastewater.com AND knpatel@sig-auto.com

APPLICATIONS MUST BE RECEIVED BY JANUARY 31, 2022

www.isa.org/wwid

WWID WEBINARS

ISA & WWID Continue to Provide Virtual Events and Plan for 2022 and Beyond

From the WWID program committee

With the unprecedented cancellations of in-person events due to the COVID-19 pandemic, our industry has had to pivot to providing online events. Both the WWID and ISA as a whole, has been actively working to adapt to this new format.

For the WWID, this has meant providing a series of technical webinars for our members. We organized 4 webinars in 2020, 3 days of multiple webinars in 2021, and have already started planning our 2022 events. The Webinars are free, so we encourage you to register and attend future events. Keep an eye on the ISA website for more announcements.

In addition to WWID-associated events, the ISA has also embarked on providing a wide range online programming:

These include:

- Virtual Conferences
- Cybersecurity Series Webinars
- IIOT & Smart Manufacturing Webinars
- Digital Transformation Webinars
- Process Control and Instrumentation Webinars
- Division-Specific Webinars
- ISA Connect Live Events

Please visit www.isa.org/virtualevents for more information.

ISA VIRTUAL CONFERENCES

2021 ISA Virtual Conferences

From www.isa.org website

The ISA is putting on several virtual conferences in 2021. Information can be found below.

Digital Transformation Series
ISA Digital Transformation Virtual Conference
31 August, 2021
9 am – 6 pm ET
Register Now!

Cybersecurity Series
ISA Cybersecurity Standards Implementation Virtual Conference
19 October, 2021
9 am – 6 pm ET
Learn More

Process Control & Instrumentation Series
ISA Process Industry Virtual Conference
2 November, 2021
9 am – 6 pm ET
Register Now!

ISA WEBINARS

2021 ISA Free Technical Webinars Series – Fall 2021 Program

From www.isa.org website

Process Control & Instrumentation Series
Importance of Process Instrumentation in Steel Industry
Part of the 2021 Process Industry Virtual Conference
14 September, 2021
10 am – 11 am ET
ZOOM REGISTRATION LINK

Process Control & Instrumentation Series
Automation and Robotics in Industrial Inspection: Trends & Advances
Part of the 2021 Process Industry Virtual Conference
5 October, 2021
10 am – 11 am ET
ZOOM REGISTRATION LINK

ISA WEBINARS

2021 ISA Connect Live Series – Fall 2021

From www.isa.org website

The ISA Water/Wastewater division invites its members to sign up for the following ISA Connect Live series of webinars.

ISA Connect is an exclusive community for members to engage in technical discussions and build their professional network. Connect Live offers the same discussion and networking in a live, virtual setting.

Connect Live with YPs
ISA Volunteer Involvement
30 September
8:00 pm ET
ZOOM REGISTRATION LINK

Connect Live with YPs
Leadership
13 October
9:00 am ET
ZOOM REGISTRATION LINK

Connect Live with YPs
Motivation and Positivity in the Workspace
18 November
8:00 pm ET
ZOOM REGISTRATION LINK

Connect Live with YPs
Work Life Balance
15 December
9:00 am ET
ZOOM REGISTRATION LINK

For more information, the series information page on:
isaautomation.isa.org/virtual-events-program/#connect-live

TECHNICAL ARTICLE

What are the Characteristics of Safe Automation Systems?

By Greg McMillan, Mike Laspisa, Hunter Vegas, Zach Brook, Steven Kormann, and Len Laskowski.

The following discussion is part of an occasional series showcasing the ISA Mentor Program, authored by Greg McMillan, industry consultant, author of numerous process control books, 2010 ISA Life Achievement Award recipient, and retired Senior Fellow from Solutia, Inc. (now Eastman Chemical). Greg will be posting questions and responses from the ISA Mentor Program, with contributions from program participants.

Mike Laspisa has spent 37-plus years working in the instrumentation and control (I&C) discipline, including 32 years as a lead I&C engineer and manufacturing plant staff I&C engineer. Mike's primary motivation is to advance the automation profession by sharing knowledge gained from plant experience as seen in the Control Talk columns, "Instrument specification: Where we are and where we should be," "I&C Construction scope," and "Instrument Index Insights."

Mike Laspisa's Question:

I have been thinking about the various definitions of "safe" as it applies to devices, I/O, control systems, and most importantly critical parameter measurements and processes in general.

For devices, we think primarily of control and on/off valve failsafe positions. What is best for both safety and process operations? Open, Closed, Forward/Recycle/Last position?

For control system I/O, we think of what should be done if an analog input is considered "bad:" Hold last good value, use default value, switch controller to manual, stop process, etc.

What is best for the process at this point in time? Boiler burner management system (BMS) controllers usually monitor I/O functionality with critical input check code and may also use redundant I/O. Redundant transmitters can be used for critical measurements. However, the control system must have a selection method to determine which transmitter to use. Selection methods include high/low selectors, average calculations (as long as signals are within x% of each other) or 2 out of 3 (2oo3) voting for shutdown interlocks. Operators should be able to select, or remove, a transmitter for service as necessary. Transmitter signal failure should remove it from service automatically.

For control systems, we think of trying to protect the process by preventing control system failures by using controller or I/O or power supply redundancy and/or segregating redundant field devices on different I/O cards.

What about a PLC processor fault: Should you turn off all outputs or just selected outputs?

In the last 15 years, shared data has become more and more prevalent. Passing data via Ethernet using OPC data managers in several cases has replaced hard-wired handshakes between controller platforms (DCS-PLC or between different CPUs). Heartbeat code needs to be added to verify that registers have live data.

If the data pass is broken, what action needs to be taken to protect process operations?

For processes, we think about what the safe states are that will protect the process quality and hopefully allow operations to correct a device failure/process upset and restart easily. Each process may require specific safe device states to maintain heating, cooling, pressure, vacuum, etc., or recycle to keep product in suspension and/or prevent pipeline blockages.

Greg McMillan's Answer

I look forward to the Mentor resources in safety instrumented systems (SIS) chiming in here. My limited experience dates back about 40 years ago when I helped Monsanto develop internal guidance for interlock systems. My main input was providing guidance and perspective on how to find and classify the root causes of unsafe conditions. I was instrumental throughout my career in getting middle signal selection to be used, primarily in pH systems. I was part of an incredibly successful effort to dramatically reduce unplanned shutdowns of a challenging large intermediate chemicals plant from five to nearly zero per year by middle signal selection and smoother, safer, and faster compressor start-ups and surge prevention by procedure automation.

In the ISA 5.9 Technical Report on PID Algorithms and Performance that has officially been issued for review, I conveyed my experience and insights on increasing signal reliability by the following.

The goals of signal selection for PID control are to primarily protect against failures, and in the process improve accuracy and the 5Rs (reliability, resolution, repeatability, rangeability and response time) of signals. With the advent of increasingly smarter digital transmitters, most of the concern to be addressed is often the sensor type and installation. Thus, redundancy of sensors and independence of installation eliminating common mode failures is the first step. The next step is to decide whether to use Lo, Hi, or Middle Signal Selection (commonly referred to as Median Select) and/or supplemented by signal averaging to enable the PID controller to continue to do its job to keep the process in a good operating region.

Where profiles are not uniform (e.g., concentration, phase, temperature, or velocity), which is a characteristic of plug flow where there is little to no back mixing and piping

discontinuities, leading to unpredictable nonuniformity and noise, location of sensors at different points and signal averaging may help. The most common example is an averaging pitot tube. For fluidized bed reactors, temperature sensors are installed in a pipe carrying the lead wires that traverses the reactor. Several of these pipes may be installed and the average computed for each pipe with Hi or Middle Signal Selection of averages used to determine the PV used for temperature control. Hi Signal Selection where each sensor signal is compared to average may also be used to rule out single sensor failures.

To promote independence, multiple sensors should be installed with separate process connections. Differential pressure and pressure transmitters should not share the same impulse lines. Separate nozzle connections are used to help maximize independence. Temperature sensors are not installed in the same thermowell that could be coated or have a loose fit or excessive vibration or other significant common mode problems. pH sensors should be separate and not share the same reference electrodes due to many possible sources of error and failures.

The most recognized failure is downscale possibly associated with transmitter failure or loss of signal, which leads to the frequent use of Hi Signal Selectors. With digital transmitters and signals, this may be less of a concern. For wireless system, there may be loss of updates, which may be addressed by a Hi Signal Selection. Downscale failure may have more safety and environmental concerns stemming from excessive concentrations, levels, pressures, and temperatures.

Middle Signal Selection inherently protects against a single failure of any type including last value, which is extremely difficult to detect and deal with automatically. Middle Signal Selection is particularly important for pH measurement because it reduces the common effects of noise, drift, coatings, glass electrode premature aging (e.g., caused by high temperatures or strong acid concentrations), dehydration, and abrasion, and reference electrode contamination. Middle signal selection offers a distinctive advantage of ignoring a slow sensor, which is particularly advantageous for pH measurement since significant aging, dehydration, and coating of the glass electrodes can increase the 86% response time from 2 seconds to 2000 seconds.

At one large chemical company, Middle Signal Selection was used on all pH loops. Middle Signal Selection can also offer simple effective diagnostics that enable quicker maintenance of a defective sensor to retain the full inherent protection. Middle Signal Selection was also used on all measurements in several large complex continuous plants reducing trips due to signal errors from 4 to less than 1 per year (each trip costing 10 or more million dollars). In general, the most hazardous operation occurs during shutdown and start-up, posing safety and monetary concerns.

While maintenance and operations need to see each sensor signal, manual signal selection by individuals is often based on favoritism that is not attentive or fact-based. Manual signal selection should be limited to situations where a sensor has a confirmed problem or is being serviced (e.g., calibrated or replaced).

For an extensive integrated perspective on diagnostics, see the Control article, “A structured approach to control system diagnostics” by Mentor Program resource Luis Navas Guzman. For an insight from Len Laskowski of the important aspects of SIS not sufficiently discussed, see the Control Talk columns, “The ins and outs of safety instrumented systems – part 1,” and, “The ins and outs of safety in instrumented systems – part 2.”

Hunter Vegas’s Answer

I struggled with Mike’s question a bit since it is rather open-ended. The “safe” solution for device, controller, PLC, or IO point very much depends on the application. The control, production, and safety engineers need to carefully evaluate the failure and ramifications to the process and make the proper choice. There is no magic answer.

That being said, I will mention a few things that tend to trip folks up:

Be very careful when obtaining analog data from external sources. Analog data that comes through the IO cards is tagged with a wealth of diagnostic data that can be used to flag issues and trigger selection and/or failure algorithms. However, data that comes via external data connections (OPC, wireless, external gateways, HART, etc.) *may or may not* have diagnostics available. The diagnostic data may be available, but it often takes additional configuration to bring it into the system. If this is not done, the diagnostics may sparse or absent entirely.

Be leery of remote IO. When an IO card is located away from the controller, it will require some kind of remote scanner or communication module to transfer that data back into the system. What happens to the remote IO when those communications are lost? Note that things need to happen on both sides—the controller needs to detect the situation and handle things on its side, and the remote IO also needs to detect the failure and respond appropriately. Again, note that the “appropriate” response could be different for every IO point.

As Greg mentioned, **beware of common cause failures**. For instance:

Having redundant transmitters utilizing the same orifice and orifice taps.

1. Having redundant orifice transmitters utilizing the same heat trace protection.

2. Having redundant transmitters using the same technology, which are susceptible to the same failures. For instance, low

process conductivity would affect the readings on redundant magmeters equally.

3. Running redundant network communication cables together could be taken out by a single event.

4. Having redundant power supplies powered by the same UPS. UPS systems fail, and often it may be better to put one power supply on UPS and the other on regular power.

5. And so on.

When considering failure modes, look beyond the obvious. For instance, don't just consider the loss of air to a single control valve. What happens if you lost air to the whole unit? Similarly, consider not only the loss of cooling water to a single condenser, but the impact of a loss of cooling water *on all* the condensers simultaneously. A control valve can fail in a lot of ways—you could lose the incoming signal, lose the air supply, have a failed positioner, have an internal plug/seat failure, have a failed diaphragm, etc. Most of those failures would drive the valve toward its fail position, but some might drive the valve the other way.

Zach Brook's Answer

My experience is more burner-focused, so I'll be responding with that application in mind. I'll defer to Hunter Vegas and Len Laskowski for the more traditional SIS commentary.

In the burner management system (BMS) world, we're all about bringing valves to their fail state positions if there's an unsafe condition detected within the purge or light-off sequence of events. However, there's not one fail state position that is going to work for all applications. Block valves, for example, will be fail-closed, whereas the vent valve will be fail-open for a fuel train. Each valve instance would have to be evaluated for what makes sense for the application.

"Bad" status is also usually treated as a vote to trip in the BMS logic. There are instances where we'd have MooN voting on multiple transmitters, which in NFPA 86 and NFPA 87 are called out as being required to be SIL 2 capable, but transmitter failure is regarded as a cause for tripping the sequence and requiring the operator to reset the unit and re-purge before attempting to light off again. This would be the same for a processor or logic system failure. The BMS would monitor for this failure and bring the unit, be it a boiler, oven, furnace, or fired heater, to the safe state when detected.

Steven Kormann's Answer

These questions raise many interesting thoughts with regards to burner management applications. I think a perspective that gets lost in burner applications is that putting together a "safe" system requires a wholistic approach that addresses all the layers and failure modes of the system.

For example, if a fuel shutoff valve is only rated for the normal operating pressure of its associated burner, an upstream regulator failure could easily expose the valve to excess line pressure and lead to premature failure of the shutoff valve. Without taking consideration of the whole system, safety equipment that is designed correctly in its specific use case may still fail to perform due to indirect failures in other parts of the system.

On the input side of things, I'm seeing increased discussion around diagnostics for discrete inputs. Current NFPA burner codes clearly call out minimum SIL capability and diagnostic requirements when analog input devices are used in BMS service, but diagnostic capability of most discrete input device applications is all but non-existent. Critical input checks can help determine if an input card or channel is faulted, but rarely can it detect a loop, sensing line, or sensor fault. Surely, we can add redundancy to help, but that does not overcome common-cause fault.

Since burner management is typically implemented as a sequence, an idea that has come up more often recently is implementing discrete input checks based on sequence state. For instance, if the minimum combustion airflow switch detects airflow, but the sequence has not started fans to induce sufficient airflow, an alarm or trip would occur. Another example would be if a low gas pressure switch downstream of a safety shutoff valve detects OK pressure before the sequence commands the valve open.

Network based data communications can certainly add extra layers of challenges. There's a wide range of standards and implementations with varying levels of integration with different vendors. Well integrated communication systems will have built-in diagnostics that require no additional design considerations. However, more typically, systems will be somewhere else on the spectrum.

Again, this is where consideration of a system as a whole comes into play. Just a few things to think about if passing critical data over a data connection:

- Beyond basic communication of device status, what is the network infrastructure?
- Is there sufficient bandwidth available to support a worst case data burst?
- What is the network redundancy or other resiliency implementation?
- What's the worst-case communication delay?
- Do the sender/receiver devices prioritize local processing over remote communication during heavy loading?

- Is there a QoS method in place to ensure that critical communication is prioritized across repeaters/switches?
- Are we introducing cybersecurity vulnerabilities into the data, whether it's through a poorly protected data tunneling or easy physical access to network equipment? Has appropriate network administration of that system been considered?
- Have rules, barriers, and procedures been set between IT/OT to ensure evolving security policies don't cause unexpected production outages?

Len Laskowski's Answer

I agree with Hunter, Zach, Steve, and Greg. As always, the mentors are spot on and I cannot articulate it better than they did. I will just offer some additional information for consideration.

I too am struggling a bit at the questions, but maybe Mike's intent was to get us to think a bit outside the box. So, I have outlined a few key words from each of his paragraphs.

Important critical measurements: If you can measure something, you should be able to control it. The trick here is to really pay attention to the measurement and make sure it is as good as possible. Also, do not be afraid to validate that it works. The more critical the measurement, the more important this is.

For example, radar level measurement is a popular technology these days. As a SIS engineer, you need to budget time to take a serious look at the installation and make sure it works. The inexperienced engineer may not do this. I have seen installations where they do not have a nozzle in the top of the vessel or proper side nozzles to build a correct bridle. One must force the issue to make the installation proper or do not use the technology. I have seen projects that just put the radar in the manhole cover and that device is looking at the man ladder, which creates all sorts of noise and false echoes as the tank fills. Here, the engineer did not do his homework and this quick, dirty, and cheap installation that has limited if any success is a disservice to the plant. The real loss here is the plant's willingness to try the technology again (if properly installed) in other applications.

Analyzers are another all-time favorite. Be sure you really understand what it takes to make the devices work. I did an installation once that we would get in calibration, and it would drift all over the place. We worked on this for months with no real lasting success. So, I decide to go to the manufacture's facility for factory training on the device. I took the training and as far as I could tell, I was doing things right, so what was wrong? One of the experts there asked, are you sure your lab is right? This never occurred to me that the lab could be wrong in analyzing these samples. Armed with this new plan, I took a sample, mixed it thoroughly, split the sample into three bottles labeled A, B and C, and put three different dates on them. I sent them to the lab, and they came back with three different results. So, we discovered that there was an error in the lab procedure.

Lesson learned: If it is important, make sure you validate it. That may mean you put in redundancy, extra nozzles, modeling, or other special equipment to check that your measurements are good. Begin to look for these tough applications as early in the project as possible and formulate a plan so that you can get money and schedule in the project.

Best for both safety and plant operations: I totally agree and that is why most SIS systems do things called secondary actions, like putting a control loop in manual and pulsing closed the control valve, to assist in a smooth start-up. In today's typical SIS Safety Life Cycle per S84 or IEC61511, a LOPA (layer of protection analysis) is usually done. A multi-discipline team should be providing guidance on what to do (open or close valves, etc.).

As a SIS engineer, you need to take that guidance and implement it. However, do not do it blindly. On occasion you may find issues that have not been addressed or secondary hazards that are created. You need to go back to the LOPA team and explain the issues to get clarification. This is not uncommon. I currently have a project that is on Rev Y of the LOPA. While a pain during design, it will start up and run smoothly (as we found and addressed the issues).

Transmitter failure should be removed from service automatically: I don't agree with that because it has no consequence to the operators and it could instill complacency. I prefer to have the bad status as an announced vote to trip unless the operator takes action. That way, a work order to repair the device can get started and the operator can manually select (with supervisor permission) to bypass the device and degrade the voting to a predetermined architecture.

PLC processor fault: While it is a noble idea to just shut down the cards or IO that failed, the reality is that it is a lot simpler and safer to just shut down the whole PLC and then figure out what went wrong once the unit is in a safe state. Human nature is to fight it, try to compensate, and keep production up. Depending on what failed, you may be doing more damage to the unit than helping it. I remember one case like this: if they would have tripped immediately, they could have come back up in hours. Instead, they fought it and made such a chemical mess inside the unit vessels that it took weeks to clean up, replace the catalyst, and restart.

If the data pass is broken, what action needs to be taken: This is a tough question and should not be left to the control engineer to decide alone. Typically projects big enough to be putting in new BPCS or SIS systems should have a meeting called a CHAZOP (Controls HAZOP). This is an opportunity to bring in senior resources and/ or vendors and third parties to make a conscious decision about such events. What actions need to happen to put the unit in a safe state if this should

occur? For example, what does an operator due if he loses all HMIs? Could this happen? Has it happened?

While not very probable, it is possible. This has happened to very modern installations before, so it is very real. The more we use digital communication protocols, the more susceptible we are to this and the more carefully this needs to be addressed. This plays directly to cybersecurity. In the old days, no hackers could externally corrupt or compromise your relay-based hardwired SIS or panel board controls.

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About the Author

Gregory K. McMillan, CAP, is a retired Senior Fellow from Solutia/Monsanto where he worked in engineering technology on process control improvement. Greg is an ISA Fellow and received the ISA Kermit Fischer Environmental Award for pH control in 1991, the Control magazine Engineer of the Year award for the process industry in 1994, was inducted into the Control magazine Process Automation Hall of Fame in 2001, was honored by InTech magazine in 2003 as one of the most influential innovators in automation, and received the ISA Life Achievement Award in 2010.

SOCIETY NEWS

ISA Executive Director Mary Ramsay to retire at end of 2021

The International Society of Automation's (ISA) Executive Director, Mary Ramsey, has decided to retire at the end of 2021.

"I really enjoyed working with the staff, board and volunteer leaders," Ramsey said. "There is such diversity in the individuals that really allowed for great ideas and discussions. The focus was always on the mission and how to bring the automation community together and prepare them for the changing technology shifts and trends of operations."

2021 ISA President Steve Mustard said that Mary Ramsey has been instrumental in ISA's ongoing transformation, leading the staff team through a challenging global pandemic and a quick pivot to digital offerings. "Her extensive industry experience, coupled with her ability to think strategically, has moved ISA forward," he said. "We will benefit from her leadership for years to come."

"I am very pleased to see the alignment to common goals and objectives which will allow the society to work toward the vision of creating a better world through automation," Ramsey said. "There are so many ways the organization can bring value to the automation profession. If I had to pick one area that I'm proud of, it would be the focus on standards education and skill development especially around cybersecurity and IIoT/Smart Manufacturing. You can't have one without the other, and ISA really has led the charge to bring stakeholders together to work on these very critical topics."

"Please join me and the rest of the Executive Board in wishing Mary a well-deserved, happy retirement and the best of luck in her future," Mustard said.

ISA names Claire Ramspeck as its new Executive Director as of 2022

The ISA is pleased to announce the hire of its new Executive Director, Claire Ramspeck. Ramspeck is the founder of Hobbs Barrett, a private consulting firm that specializes in association management with a focus on development, adoption, and dissemination of standards and other technical products and services. Prior to founding Hobbs Barrett, she built a successful career as the Director of Technology at the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the Managing Director of Standards Development at the American Society of Mechanical Engineers (ASME.)

In addition to her 25-year history of leading standards and technology businesses within associations, Ramspeck also brings a wealth of volunteer experience, chairing and serving on several boards and committees for the American National Standards Institute (ANSI) and Underwriters Laboratory (UL.)

ISA President Steve Mustard, who chaired the Executive Search committee to recruit and select Ramspeck, highlighted her standards experience as a key factor in the committee's decision. "Claire has an impressive history of collaborating with volunteers and subject matter experts to develop standards, research, and other projects that meet the needs of industry," said Mustard. "ISA's value is rooted in our standards development, and we build our portfolio of market offerings around key standards that help industries lower costs, boost productivity, and improve safety and cybersecurity. Claire's background will empower her to take ISA's valuable content to the next level."

"Given Claire's focus on technology adoption, I'm confident ISA will continue to build on its considerable strengths and continue to bring value to the industries we serve."

AUTO-QUIZ: BACK TO BASICS

Slip in AC Induction Motors

From the ISA Certification Program

This automation industry quiz question comes from the ISA Certified Automation Professional (CAP) certification program. ISA CAP certification provides a non-biased, third-party, objective assessment and confirmation of an automation professional's skills. The CAP exam is focused on direction, definition, design, development/application, deployment, documentation, and support of systems, software, and equipment used in control systems, manufacturing information systems, systems integration, and operational consulting.

Question:

"Slip" in an AC induction motor is defined as:

a) synchronous speed minus no load speed

b) difference between speed of stator field and rotor speed

c) rated speed plus synchronous speed

d) speed at which motor develops torque

e) none of the above

Answer:

Slip is usually expressed as a percentage, and varies by motor, from nominally 0.5 percent for very large motors to about 5 percent for small, specialized motors. If n_s is the stator electrical speed and n_r is the rotor's mechanical speed, the slip, S, is defined by:

$S = (n_s - n_r) / n_s$

Motor rotation is developed in an AC induction motor through the effects of a moving magnetic field. As the speed of the rotor drops below the stator speed, or synchronous speed, the rotation rate of the magnetic field in the rotor increases, inducing more current in the rotor's windings and creating more torque.

Slip is required to produce torque. Under load, the rotor speed drops, and the slip increases enough to create sufficient additional torque to turn the load. A very efficient way to control slip is to use a variable frequency drive

The correct answer is B, "difference between speed of stator field and rotor speed."

Reference: *Nicholas Sands, P.E., CAP and Ian Verhappen, P.Eng., CAP., A Guide to the Automation Body of Knowledge. To read a brief Q&A with the authors, plus download a free 116-page excerpt from the book, click this link.*

ISA CAP and CCST certification programs provide a non-biased, third-party, objective assessment and confirmation of an automation professional's skills.

The CAP exam is focused on direction, definition, design, development/application, deployment, documentation, and support of systems, software, and equipment used in control systems, manufacturing information systems, systems integration, and operational consulting.

Certified Control System Technicians (CCSTs) calibrate, document, troubleshoot, and repair/replace instrumentation for systems that measure and control level, temperature, pressure, flow, and other process variables.

Question originally appeared in the ISA Certified Automation Professional; (CAP) program column of https://blog.isa.org.

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(https://blog.isa.org/autoquiz-slip-ac-induction-motor)

SOCIETY NEWS

The New Normal

By Steve Mustard, 2021 ISA Society President

"Success is simple. Do what's right, the right way, at the right time." – Arnold H. Glasow

Arnold H. Glasow was a famous businessman from the US, who lived between 1905 and 1998. He ran his business for over 60 years and published his first book, *Glasow's Gloombusters*, at age 92. Talk about patience!

As we come to the end of another year, we begin our plans for the next. The 2022 Executive Board, led by President Carlos Mandolesi, has been meeting in a series of virtual executive summits. In these summits, the board has been reviewing what has been achieved, and discusses what the Society should focus on next. Our strategic objectives continue to be focused on industry reach and awareness, membership programs, technical education and certification, and leadership and business skills development.

The Society recently sold its headquarters building at TW Alexander Drive, where it has been based since 1980. The new headquarters is nearby; a modern facility sized to current needs. The relocation will be completed soon and is expected to be operational in early 2022.

Mary Ramsey, our Executive Director for the past three years, is retiring at the end of this year. Mary successfully navigated through many challenges over her tenure, including adjusting to a global pandemic, and has set the Society on a positive course. The Executive Board tasked a diverse group of eight members who collectively spent 200 hours over the course of four months searching and recommending a new Executive Director.

We welcomed Claire Ramspeck as our new Executive Director on 1 November. Claire has over 25 years of experience in associations such as the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the American Society of Mechanical Engineers (ASME). I believe her background in standards will help take the Society to new heights.

I know from talking to members that many want to see ISA do more and do it with more haste. This is understandable. I want you all to know that the Executive Board is listening and is working diligently to achieve all our collective aims. Let me highlight a couple of what I believe are major accomplishments over this last year.

Amidst all this change at ISA, I have been closing out my year as President by attending many virtual District meetings. I have talked about our strategy and what we have been able to achieve together, such as:

- Successful virtual events with increased participation from outside North America. Our most recent virtual event, which took place in the Malaysia time zone, had over 700 registrants.

- Increased demand for online learning. Making material available online and in modules allows people to consume the content at their own pace, wherever they are. Online exams allow people to complete the certification process in their home or at work. I believe this will increase the reach of our training and certification programs.

- New training programs and certificates launched, with more coming soon. The Automation Project Management Specialist Certificate was launched recently. The first module in the program is available free to all members. I completed the course myself and passed the exam. Even if you are not managing automation projects, I believe the knowledge will be valuable to you.

- Connect Live sessions with Society Officers, Young Professionals, and Divisions. In this virtual world, we have been able to continue networking with Connect Live. The Society Officers host sessions every two months where members can discuss any topic on their minds. The Young Professionals host discussions on human skills and have produced a fantastic series of fireside chats with former presidents. Divisions also use Connect Live to host real-time technical discussions.

All that said, the Board is committed to moving the Society forward. We consider Arnold Glasow's guidance: *Success is simple. Do what's right, the right way, at the right time*. As we reach the end of 2021, please bear with us as we transition to the Society's new headquarters with our new Executive Director and Executive Board.

As always, feel free to contact me if you have any thoughts or comments. What new opportunities do you see for ISA?

Let us all be patient as we continue to build a better world through automation.

Steve Mustard
2021 ISA President

About the Author

Steve Mustard is an industrial automation consultant with extensive technical and management experience across multiple sectors. He is a licensed Professional Engineer (PE), ISA Certified Automation Professional® (CAP®), UK registered Chartered Engineer (CEng), European registered Engineer (Eur Ing), GIAC Global Industrial Cyber Security Professional (GICSP), and Certified Mission Critical Professional (CMCP). Backed by 30 years of engineering experience, Mustard specializes in the development and management of real-time embedded equipment and automation systems and cybersecurity risk management related to those systems. He serves as president of National Automation, Inc. Mustard writes and presents on a wide array of technical topics and is the author of 'Mission Critical Operations Primer," published by ISA.

Call for Newsletter Articles

The WWID newsletter is published four times a year (winter, spring, summer, and fall) and reaches the WWID's 2,000+ members. Each issue is approximately 16-32 pages long, and is electronically printed in color PDF format. A notification email goes out to all WWID members and it is available for public download at www.isawaterwastewater.com.

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

Article submissions should be 500-2000 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 should be avoided. We actively encourage authors to include several photos and/or figures to go along with their article.

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 are acceptable, but the focus of the article should be technical content and not just sales literature. If you are unsure of whether your article idea is workable, please contact our newsletter editor for more information – we are here to help.

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 personalities and/or leaders 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 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@grahamnasby.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 distribution of 2,000+ 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:

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

Advertising in the newsletter is offered in full page, half-page and quarter page formats. 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 artwork is acceptable.

The current advertising rates are as follows:

Per Issue:
- Full page, full color (7" x 9"): $500
- Full page, full color, (8.5x11"), with bleed $600
- Half page horizontal, full color (7"x4.5"): $350
- Half page vertical, full color (3.5"x9"): $350
- Quarter page, full color (3.5" W x 4.5" H): $250

Per Year: Apply 20% discount if purchasing 4 ads at a time

Other sizes of advertisements are available, but are priced on an individual basis. Contact us 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, PDF, PNG, JPG or GIF formats. EPS, PDF and PNG formats are preferred. Images should be at least 300dpi resolution if possible. A complete list of ad specs can be found at www.isawaterwastewater.com .

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@grahamnasby.com .

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About the ISA Water/Wastewater Industries Division

The ISA Water / 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 actively supports ISA conferences and events that provide presentations and published proceedings of interest to the municipal water/wastewater sector. The division also publishes a quarterly newsletter, and has a scholarship program to encourage young people to pursue careers in the water/wastewater automation, instrumentation and SCADA field. For more information see www.isa.org/wwid/ and www.isawaterwastewater.com

ISA Water/Wastewater Industry Division