Water/Wastewater Industry Division

Setting the Standard for Automation™

Calendar of WWID Events

July 28, 2020 **Technical Webinar:**
Cybersecurity Risks for the Water Sector
Jointly presented by the WWID & AWWA

Sept 22, 2020 **Technical Webinar:**
Control System Cybersecurity for Water/Energy Utilities

In this Issue

Newsletter Summer 2020

Director's Welcome

Don Dickinson, Phoenix Contact USA

Welcome to the summer of 2020 – a summer very different from what we might have envisioned at the beginning of the year. No doubt our winter dreams of summer vacations and activities have been dramatically altered. Sadly, as the result of COVID-19, many have endured much greater challenges than canceled plans for summer fun. Health and economic concerns have displaced our typical carefree, summer attitudes. COVID-19 has impacted us professionally as well. Many are working from home, and normal business routines have been disrupted. ISA has canceled all in-person events through the end of the year. What is most disconcerting, no one knows when – or even if, we will return to what once was called normal. Truly challenging times.

However, what I do know to be true is that the people and organizations who will survive and thrive in the post-COVID world, are those who are able to adapt to the new normal. ISA is a good example. To counter the cancelation of in-person events, ISA has expanded its offering of virtual events, including webinars and conferences. The virtual events are a safe, convenient alternative to in-person conferences, and have a benefit over in-person events. Virtual events greatly increase accessibility to content for personal and professional development for those who normally could not attend an event. Go to the ISA website for.... **(continued on page 2)**

Newsletter Editor's Welcome

Graham Nasby, City of Guelph Water Services

Greetings to all of our ISA Water/Wastewater Division members. This is certainly one of the strangest summers I can ever remember. Many businesses still closed, there is uncertainty about the schools in the fall, travel restrictions, and having to wear a mask when out in public. It's a situation that we will all remember for years to come. However, with all the doom and gloom there is still a glimmer of hope that things will improve. COVID-19 infection rates are down in many countries and there are multiple efforts underway to develop a vaccine. In the meantime, we will all have to continue to rely on our patience and resilience as we work through the pandemic together. We've made it this far – I'm sure we can all see it through to the end.

In this issue, you will find an update on several free online webinars that your WWID is coordinating in lieu of having an annual conference with ISA. We also have exciting developments with the ISA112 SCADA standards committee and the Open Process Automation Standard. In particular, I would like to highlight the recently released draft ISA112 SCADA systems lifecycle diagram which provides a framework for managing SCADA systems in terms of facility SCADA standards, project execution, and long-term management. The lifecycle is also complemented with a SCADA model architecture…. **(continued on page 2)**

WWID Director's Message
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…details and to register for an upcoming virtual event.

Although the virtual events provide increased access to valuable content, I should admit, for me, a virtual event is not the same as an in-person event. The best part of an in-person event is the opportunity to network and engage people that I might not otherwise get to see face-to-face. There is something special about the unexpected connections and conversations that occur at an in-person event which cannot be replicated virtually. Perhaps that feeling is accentuated with the isolation imposed upon us by COVID-19, especially for those of us working from home. Not surprising that many of us are looking forward to the expected return (fingers crossed) of in-person events in 2021.

However, back to the topic of adapting to a new environment. It is quite possible that going forward, some in-person ISA events will include a virtual component. Hybrid events are the best of both worlds – all the camaraderie of an in-person event, combined with increased accessibility to content of virtual events. Those who are unable to attend the in-person event would still have access to content for professional development. And those who do attend, will have the benefit of personal engagement, and access to content that might have been missed otherwise. Have you ever had to decide which session to attend when there are two scheduled for the same time slot? A hybrid event solves that problem. I'm excited about the possibilities ISA is considering for 2021.

In the meantime, ISA is developing new ways for members to connect in the digital realm. ISA Connect is a new, online platform for member engagement. ISA Connect brings a new dimension to the member experience, and provide new ways for members to connect and collaborate. It is one more example of how ISA is adapting to our changing world.

We are facing uncertain times. However, as the old saying goes, "The best way to predict your future is to create it." If we are willing to adapt to new situations, we will survive and thrive. ISA is adapting to meet the evolving needs of its members. I encourage you to take full advantage of the many resources ISA offers for personal and professional development. I also encourage you to get involved in ISA activities, whether it's a division or a section – or both. Create your future by getting involved.

Wishing you the best summer possible.

Warmest Regards,

Don Dickinson
WWID Director (2020-2021)
ddickinson@phoenixcontact.com

Newsletter Editor's Welcome
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…diagram that helps provide a comment framework over which to structure SCADA systems.

We also have an excellent article in this issue about a suggested workflow for managing the detailed design process for automation projects in general. Written by Brian Mast, of Cooper Bell Consulting, the article about the workflow and P&IDs provides reassurance to many of us who are involved with the project design, construction and commissioning part of our industry.

Lastly, I would like to thank all of our various volunteer committee members who have continued to stay in touch with each other during what has been a challenging last few months. Trying to manage our personal and professional lives during a global pandemic is no easy feat, and the efforts of everyone have not gone unnoticed. Thank you to everyone for your part to keep the water running, the lights on, our families safe, and to keep our economy going.

Stay safe and keep looking towards a bright future.

Warmest Regards,

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

WELCOME

Director Elect's Welcome

Manoj Yegnaraman, Carollo Engineers Inc.

A warm welcome to all of our ISA Water Wastewater Industries Division (WWID) members worldwide. I hope each one of you, and your families are doing well, and staying safe.

In May 2020, the US Department of Homeland Security provided an advisory memorandum on identification of essential critical infrastructure workers during the COVID-19 response. Several workers in this advisory list represent our Water and Wastewater Industry. The essential services provided by workers in the worldwide W/WW industry have helped everyone to be safe, and to have a functioning society. I am sure many of you reading this newsletter, fall under this category. Thank you for all that you do!

In our Spring 2020 newsletter, I gave you an update regarding the changes to the 2020 ISA activities, specifically regarding our annual Energy and Water Automation Conference (EWAC). The EWAC committee contains volunteers from our WWID and from the Power Industries Division (POWID).

The EWAC committee has been working to put together several online webinars for the year. The committee has conducted one webinar, and will conduct another in September, as part of the ISA virtual events – Process Control and Instrumentations program:

1. Taking Action on Cybersecurity Risks in the Water Sector by Kevin Morley (July 28, 1-2 PM ET)

2. Control System Cybersecurity for Water/Energy Utilities by Jonathan Grant (September 22, 1-2 PM ET)

More details on upcoming events including their dates/times can be found at: https://isaautomation.isa.org/virtual-events-program-process-control-and-instrumentation/.

The committee is also working on plans for more webinars in Fall 2020.

The next face-to-face conference for our division is the 2021 ISA Energy and Water Automation Conference (EWAC in San Antonio, Texas, USA on August 17-19, 2021.

If you have any questions, or want to be involved in our ISA WWID division activities, please let me know. Thank you and take care.

Manoj Yegnaraman, PE
2020-2021 Director-Elect, ISA WWID
2019-2020 General Chair, ISA EWAC
Associate VP, Carollo Engineers, Inc.
myegnaraman@carollo.com

WWID WEBINARS

ISA & WWID Launch 2020 Virtual Events

From the WWID program committee

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

For the WWID, this has meant providing a series of technical webinars for our members. The first of these two webinars was held in July. The second is scheduled for September 22, with more to come. Please read about these events on the following page. The Webinars are free, so we encourage you to register and attend future events.

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.

TECHNICAL WEBINAR

Taking Action on Cybersecurity Risks in the Water Sector
TUESDAY, JULY 28, 2020
2:00 PM EASTERN, 11:00 AM PACIFIC (UTC-04:00)
DETAILS AT: HTTP://WWW.ISA.ORG/VIRTUALEVENTS

The ISA Water/Wastewater division hosted a free webinar about Cybersecurity risks in the Water Sector on Tuesday, July 28, 2020. Held at 1:00pm-2:00pm Eastern (UTC-04:00) and 10am Pacific, the one-hour presentation featured Dr. Kevin M. Morley, who is the manager of federal relations for the AWWA.

The AWWA and WWID have been involved in joint projects for several years now, and we were pleased to have Dr. Morley as a guest presenter. Dr. Morley has special skill in explaining complex topics from a public policy and risk perspective.

In his talk, entitled "Taking Action on Cybersecurity Risks in the Water Sector," Dr. Morley focused on the following steps in establishing a cybersecurity policy framework:

- **Step One:** Recognize that there is a credible and active cybersecurity system threat.
- **Step Two:** Understand that you have a fiduciary and statutory obligation to manage the risk.
- **Step Three:** Take action to assess the vulnerabilities that may expose your system to such threats.
- **Step Four:** Determine what actions will be taken to manage cyber risks.

This presentation provided an overview of the US regulatory requirements for risk and resilience assessments, and identified a systematic approach for helping utilities navigate steps to address potential cyberattacks.

More than 300 people registered and attended the webinar.

About the speaker

Kevin M. Morley, PhD is Manager, Federal Relations for the American Water Works Association (AWWA). He works closely with multiple organizations to advance the security and preparedness of the water sector. This includes supporting the development of several ANSI/AWWA standards that represent minimum best practice for water sector risk and resilience management, including cybersecurity guidance. He is a leading expert on §2013 of America's Water Infrastructure Act (AWIA) of 2018 and multiple resources that enable water system to advance their security and preparedness to all-hazards.

Dr. Morley received his PhD from George Mason University for research on water sector resilience and developing the Utility Resilience Index (URI). He holds a MS from the State University of New York College of Environmental Science and Forestry and a BA from Syracuse University

WWID TECHNICAL WEBINAR

Control System Cybersecurity for Water/Power Utilities
TUESDAY, SEPTEMBER 22, 2020
2:00 PM EASTERN, 11:00 AM PACIFIC (UTC-04:00)
REGISTER AT: HTTP://WWW.ISA.ORG/VIRTUALEVENTS

The ISA Water/Wastewater division is excited to announce that we will be hosting a free webinar about Control System Cybersecurity for Water/Energy Utilities on Tuesday, September 22, 2020. Held at 1:00pm-2:00pm Eastern (UTC-04:00) and 10am Pacific, the one-hour presentation will feature Jonathan H. Grant, PE, CISSP, who is Automation Engineering with the engineering consulting firm CDM Smith

Jon has been a long-time volunteer with the WWID, and in the past has presented at both the ISA Water/Wastewater and Automatic Controls Symposium, and more recently at the ISA Energy and Water Automation Conference. He is based out of Canton, Massachusetts, USA

This presentation will build upon the various levels of ISA content provided in the area of cybersecurity, to identify the continued importance and need for cybersecurity as it relates to control systems. The roles played by IT/OT in cybersecurity, as well as the common practices that can be applied to mitigate control system risk will be covered.

Special focus will be how the ISA/IEC-62443 series of cybersecurity standards, and other industry best practices can be used to guide the cybersecurity hardening of control systems. The speaker will also provide an overview of various resources that can be used to help organizations secure their control systems and protect themselves from the risk of cyber-attack and disruptions to operations.

Attendance for the webinar is no cost, but registration is required. Please register at http://www.isa.org/virtualevents

About the speaker:

Jonathan Grant, PE, CISSP is a Control Systems Leader with technical leadership, employee management, and design experience in instrumentation and controls from concept through construction. Specialization in industrial control system design, with additional experience in SCADA cybersecurity. Ability to work as design or management lead on numerous concurrent projects. Excellent oral and written communication skills, proven track record of quality technical solutions, and commitment to client satisfaction.

Mr. Grant has 22 Years' Experience and is a licensed professional engineer in multiple US states. He received his B.S. in Chemical Engineering from the University of Maine. He holds the (ISC)2 Certified Information Systems Security Professional (CISSP) and International Society of Automation (ISA) – ISA/IEC 62443 Cybersecurity Expert designations.

TECHNICAL ARTICLE

Open Process Automation: From Concept to Reality

By Mohan Kalyanaraman, Don Bartusiak, Bradley G. Houk, Steve Bitar, David DeBari - ExxonMobil Research & Engineering

Automation and control systems are at the heart of modern industrial manufacturing. While the distributed control systems (DCS) have proven to be reliable over the last few decades, the most control systems still remain closed and proprietary.

Unlike the DCS itself, the software layer above the DCS's, such as business reporting/decision-support systems and resource planning/scheduling systems, has evolved to use commercial off-the-shelf hardware that are easily upgradeable and keep up with the advances in computing. Application software at the level above the DCS is now relatively platform-independent and replaceable.

The traditional DCS itself is however a different story. The closed nature of the DCS makes it difficult to upgrade components to take advantage of advances in computing power and has reduced the ability to insert new technology.

Manufacturing companies are trying to improve their computing and procurement strategies by integrating information technology (IT) and operational technology (OT) and to improve their profitability by deploying advanced data analytics, Artificial Intelligence (AI), and Machine Learning (ML) tools. These advanced computing tools create the need for open, real-time access to operational data without the constraints created by the filter of a closed DCS system. With the convergence of the above mentioned trends, it became clear that a different architecture for control systems is needed. These and other needs motivated ExxonMobil to be a founding member of the Open Process Automation™ Forum (OPAF).

Open Process Automation™ Forum

The Open Process Automation is a forum organized by The Open Group. Nearly 100 companies are members of the Forum with about a quarter of the members being end-users. The operating companies represent many industry verticals, including: Oil & Gas, Refining, Petrochemical, Specialty Chemical, Pulp and Paper, Pharma and Industrial gases, among others.

The membership also comprises seven distributed control system suppliers and a host of software and hardware providers as well as Systems Integrators (SI). The vision for the Open Process Automation Forum is to create a standards-based, open, interoperable, modular, secure-by-design process control architecture[1].

The key requirement is that the interfaces and data models of software and hardware components are standardized to meet the interoperability and interchangeability criteria. The ultimate win would be to establish a thriving marketplace where suppliers are able to place their certified hardware and software conformant components and end users have access to the registry of such components for systems integrators to assemble into a system against end-user specifications.

End-users would benefit from increased competition, ability to continually upgrade to take advantage of increase in computing power, avoidance of vendor lock-in, and increased innovation, as well as data access and deployment of applications at all levels of the control stack. For suppliers, this provides an opportunity to reach new markets and consumers, while differentiating themselves through specialized services, as well as addressing customer needs.

The Forum is developing both the business practices and the standards (O-PAS™) required for achieving this vision of the members.

Using a "standard of standards" approach, the Forum uses the practice of selecting existing standards (subject to applicability) to form the core parts of the O-PAS standard, so that it can reflect the principles laid out by the forum members. Only when there are no acceptable standards already available, does the forum then attempt to develop its own individual standards to fill the whitespace to ensure the overall O-PAS standard's coverage.

The governing principles are called quality attributes that have been debated and agreed upon by the members. The top 10 quality attributes are shown in Table 1.

Table 1 – Open Process Automation quality attributes

Interoperability	Scalability	Affordability	Availability
Modularity	Securability	Portability	Discoverability
Standards conformance	Reliability		

Status of OPA Standard Development

The Forum has formal liaison agreements with multiple standards and industry organizations, including ISA, NAMUR, ZVEI, PLCopen, OPC Foundation, FieldComm Group, etc. The use of official liaisons is to ensure that the O-PAS is aligned with activities across the industry.

Version 1 of the O-PAS was published in 2019 January and version 2 was published in 2020 February. Version 1 focused on interoperability, version 2 is focused on configuration portability, and version 3 will focus on application portability.

[1]Blue, D., Tung, E., Stevens, D., et al. (2018). Open Process Automation Business Guide. *The Open Group*. https://publications.opengroup.org/g182

Shown in Table 2 is a list of the parts of the standards and referenced industry standards that are incorporated in O-PAS Versions 1.0[2] and 2.0[3].

Table 2- Industry standards incorporated into the Open Process Automation Standard

O-PAS Part	Subject matter	Referenced standards
Part 1	Technical architecture	IEC 62264 (ISA 95)
Part 2	Security	IEC 62443 (ISA 99)
Part 3	Profiles	n.a.
Part 4	Connectivity framework	IEC 62541 (OPC UA)
Part 5	System management	DMTF (Redfish)
Part 6	Information and exchange models	IEC 62714 (AutomationML) IEC 62682 (ISA 18) IEC 61131 IEC 61499
Part 7	Physical platform	"whitespace"

Note: The term "whitespace" means there is no current available standard that covers the subject matter and will be taken up for development by the Forum.

Figure 1 shows the reference architecture of the OPA vision.

The key elements are as follows:

- Flat architecture as opposed to the layered control architecture with a Distributed control node (DCN). A DCN would have at a minimum I/O signal processing and could host regulatory control or more advanced control applications at the edge as required for latency or availability. The DCN communicates with other DCN's on the network through a real time bus and would provide data directly to any authorized application
- Industry-standard O-PAS connectivity framework (OCF)
- An advanced computing platform (ACP) that provides the necessary computing horsepower to run advanced applications
- Provision for connection to legacy DCS/PLC systems through gateway devices

Moving from vision to reality

Even as the Forum standards are being developed, there is a push by the member companies to test and refine their prototypes against the standards and for end user companies to get prepared for deployment.

OPA Proof-of-Concept

In early 2018, ExxonMobil demonstrated a proof-of-concept using Lockheed Martin as a system integrator. The PoC consisted of components from 10 different suppliers integrated together as one operating system. Interoperability, interchangeability, configuration portability and application portability were among the quality attributes demonstrated[4].

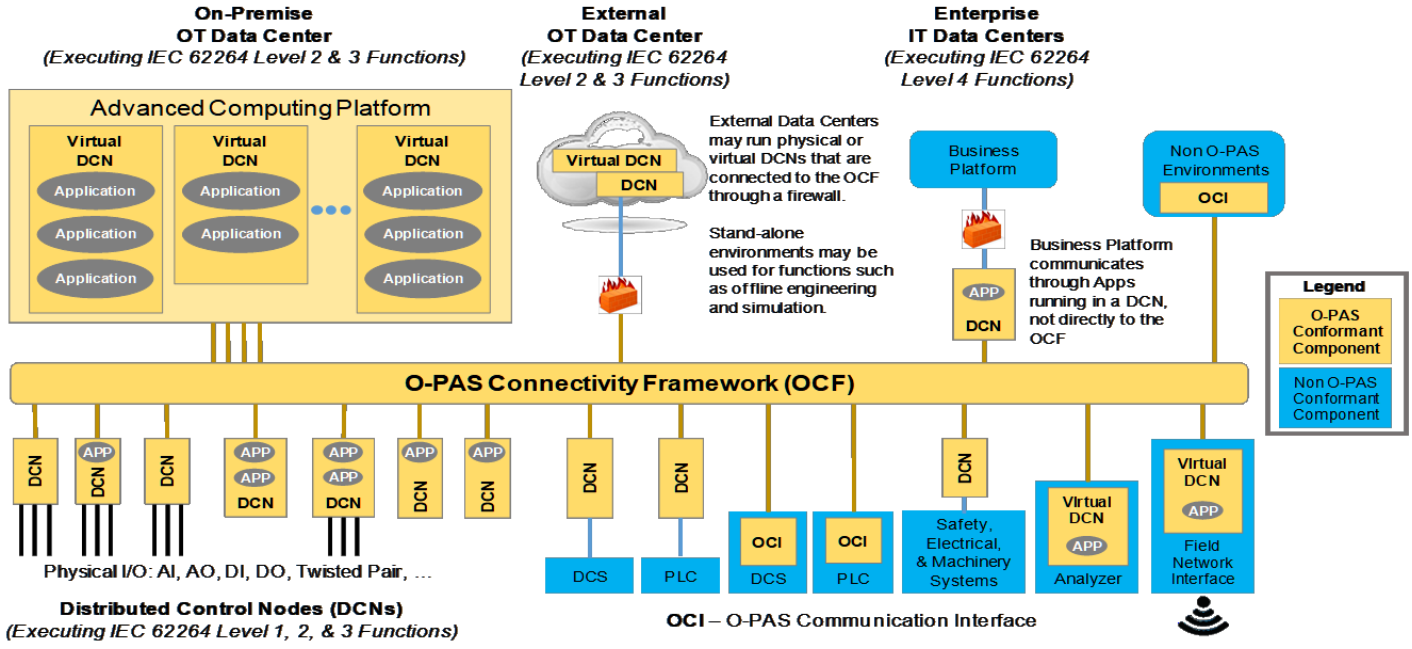


Figure 1 – Open Process Automation reference architecture (Source: Open Group)

[2] Brandl, D., Bitar, S., et al. (2019). O-PAS™ Standard – Version 1. *The Open Group*. https://publications.opengroup.org/c19f

[3] Brandl D, Smith K. et al. (2020). O-PAS™ Standard – Version 2.0 Preliminary. *The Open Group*. https://publications.opengroup.org/p201

[4] D. Bartsiak et. al., 2019 IFAC World Congress paper on OPA

Figure 2 – The OPA prototype system as it executes control and data collection functions on a catalyst testing pilot unit in ExxonMobil research facility in Clinton, New Jersey, USA.

Interoperability Workshop

The first interoperability (IOP) workshop was held in June 2019 at the ISA headquarters in Raleigh, North Carolina, USA. In in the week-long IOP event, 15 of the member companies came together and brought devices and software components to test against the first version of the standard. The workshop focused primarily on communications. There was a good sharing of learning and participant companies took back several lessons to refine their products. A second interoperability workshop is in the planning stage to test against configuration portability.

OPA Prototype- Pilot plant

In 2019 as a follow-up to its proof-of-concept work, ExxonMobil replaced a legacy control system on a pilot plant used to test catalyst on distillate desulfurization service. The control console is shown in Figure 2. The unit process had real hydrocarbons, hydrogen and operated at high temperature and pressure of 600 DegF and 1200 psig with about 130 I/O points. For building the OPA prototype pilot system, ExxonMobil worked with Lockheed Martin and Wood as system integrators. The prototype used a more robust grade of DCN hardware and other components sourced from different vendors such as Yokogawa, Intel, Phoenix Contact and NXT control. A detailed list of components used are shown in Figure 3. An OPC UA abstraction layer was built and used in the prototype using Matrikon's SDK.

The OPA pilot system came on stream in January 2020 and it operated continuously for 70 days before being shut down. The OPA system demonstrated the ability to reproduce the functionality of the DCS system, demonstrated control stability and availability, and provided an acceptable user experience. Feedback from the operator was positive and system was very responsive. Figure 4 shows a picture of the control cabinet and console of the OPA system.

Collaboration partner end-user activity

Even as the standards are being selected and prototype products are being developed by the suppliers, it is important for operating companies to become ready to be able to deploy these systems. Part of the readiness involves testing of the components, applicable standards, and developing criteria to qualify the systems put together from the open architecture components.

To accelerate the development and develop the market, a group of end user companies have formed a collaboration partner program in preparation for field trials of systems. The

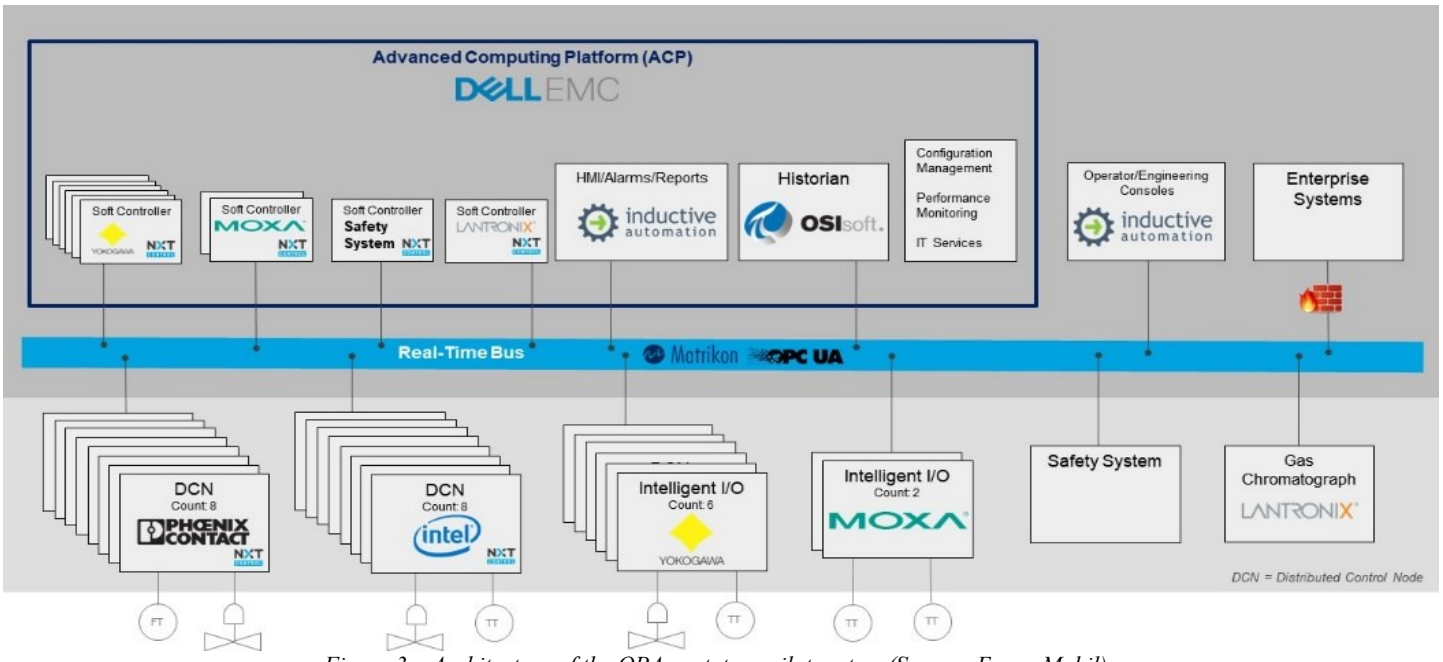


Figure 3 – Architecture of the OPA prototype pilot system (Source: Exxon Mobil)

end user companies are Aramco Services, BASF, Conoco Phillips, Dow, ExxonMobil, Georgia-Pacific, Linde and Reliance. The companies span different industry verticals and geographies.

One of the major goals of this activity is to evaluate prototype components available from suppliers and test the applicability of standards to address questions on robustness prior to initiating field trials. The companies will share non-competitive learnings from their testing to improve the collective learning curve. Following successful completion of joint test bed activities, the intent is that operating companies then follow-up conduct their own independent field trials which are specific to their needs.

ExxonMobil has started up its test bed with Yokogawa acting as a systems integrator and has started to work on testing components and concepts. At the NAMUR General Assembly conference in November 2019, BASF showcased its 'clear water' demonstrator unit (Figure 5) using DCN components from multiple vendors and open process automation and modular packaging concepts. Other operating companies are progressing their own plans for test facilities.

Figure 4 – OPA Prototype's control rack (Source: Exxon Mobil)

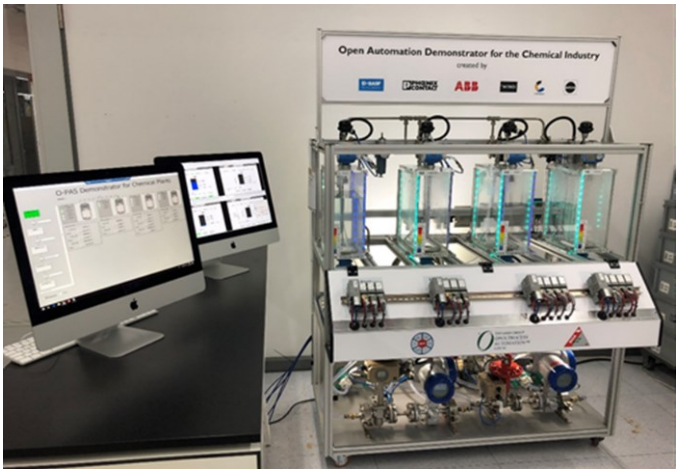


Figure 5 – BASF open automation demonstrator unit was unveiled in November2019 at the NAMUR General Assembly meeting in Bad Neuenahr, Germany (image courtesy of BASF)

Summary

Industry experience in other sectors such as avionics and networking telecommunications have shown that standardization of interfaces has resulted in driving down cost and allowing greater innovation and increasing competition. Since its beginning in November 2016, The Open Group's OPA Forum is moving fast to select standards and transforming the control systems into an open, interoperable architecture and creating the right framework for a successful marketplace for suppliers, end users and system integrators. The operating companies and suppliers are devoting resources, money and dedication to accelerating the transition to this new chapter in automation. The active members of the Forum have also been able to benefit from new networking and knowledge sharing opportunities through their work, as well as having some fun in the process (Figure 6).

The OPA Forum continues to welcome new members from the suppliers, end users and systems integrators community to join and make your voice heard. To learn more and join us, please visit www.opengroup.org/opaf. For more information, please contact mike.hickey@opengroup.org or one of the authors.

Figure 6 – Open Process Automation Forum members pose at the ARC 2020 annual meeting in Orlando, Florida, USA.

About the Authors:

Mohan Kalyanaraman holds a Ph.D. in Materials Science and an MBA and has 24 years of experience in catalysis, commercialization, and business development. He is currently a technology acquisition advisor for ExxonMobil Research & Engineering and serves as the Marketing and Outreach co-chair for OPAF.

Don Bartusiak is Chief Engineer, Process Control for ExxonMobil Research and Engineering holds a Ph.D, in Chemical Engineering. He has 40 years of industry experience with 33 years at ExxonMobil. He is currently the Co-chair of the Open Process Automation Forum of The Open Group and has won numerous leadership awards for his work in automation.

Bradley Houk is a Senior Engineering Advisor with ExxonMobil Research and Engineering based in Spring, TX. Brad is a Professional Engineer. He has over 30 years in the development and deployment of automation and optimization technologies in the refining and petrochemical industries and currently leads the OPA R&D program.

Steve Bitar is an automation leader in ExxonMobil Research and Engineering. He led the R&D work for control systems replacement for ExxonMobil and was the first co-chair of the technology working group of the Forum in 2017-2018.

David DeBari is an Innovator and a Process Control Engineer for the ExxonMobil Research and Engineering Company with many years of automation experience in both continuous and batch processes. David leads the application portability sub-committee of the technology working group of the Forum and is the Lead Engineer for the proof of concept, prototype, and test bed projects.

About OPA & O-PAS

Open Process Automation™ Forum is a Forum of The Open Group and is developing and delivering a standards-based, open, secure, and interoperable process control architecture through the collaboration of global leaders in process industries, system integrators, suppliers, integrated DCS vendors, academia, and other standards organizations. (taken from the OPAF brochure)

Open Process Automation Standards (O-PAS™) are the standards adopted or developed by the membership of the Open Process Automation™ Forum to deliver the open, secure, interoperable process control architecture. The O-PAS will adopt existing standards where available and applicable standards exist, and will develop new standards if none currently exist or is applicable.

ISA PUBLISHING

ISA Publishes Guide to Cybersecurity Standards – Overview of ISA/IEC-62443

From ISA news release

The International Society of Automation (ISA) and the ISA Global Cybersecurity Alliance have released a new guide to the world's only consensus-based automation cybersecurity standards.

The document, "Quick Start Guide: An Overview of the ISA/IEC 62443 Series of Standards," is now available for download at www.isa.org/cyberguide, and provides a high-level view of the objectives and benefits of these standards—as well as easy-to-use explainers on how to navigate them. The guide explores how and why IT and OT/ICS need unique types of protection against cyber threats and offers the latest recommendations on patch management.

This new guide answers some of the most common questions about the ISA/IEC 62443 Standards, including:

- Why is this series of standards important? What are the benefits of using the standards?
- How are IT and ICS systems different?
- Which documents are part of the series and how can I use them to find what I need?
- Where can I find the current best practices around patch management?

The ISA Global Cybersecurity Alliance's Advocacy and Adoption work group coordinated the development of the guide, which was authored by Johan Nye. Nye is an independent consultant specializing in industrial control systems and cybersecurity. During his career spanning more than 38 years, Nye has designed ICS system architectures, created company standards and policies, implemented major ICS projects, supported ICS site engineers, and contributed to the design of several ICS products.

"Automation cybersecurity standards are crucial in this increasingly connected world," says Mary Ramsey, ISA executive director. "The ISA/IEC 62443 Series of Standards leads the way as the world's only consensus-based standards that focus on automation cybersecurity. One goal of the ISA Global Cybersecurity Alliance is to raise awareness of these standards and encourage their adoption across a wide range of industries. We are grateful to the ISAGCA Advocacy and Adoption work group and Johan Nye for distilling these standards into a user-friendly format that can be shared widely."

"Quick Start Guide: An Overview of the ISA/IEC 62443 Series of Standards" can be accessed by filling out a form at http://www.isa.org/cyberguide.

ISA STANDARDS

News from ISA Standards

From ISA Standards Department

ISA112 Releases Draft SCADA Life Cycle

The ISA112, SCADA Systems, standards committee is developing a comprehensive standard covering best practices design, implementation, and long-term management of supervisory control and data acquisition (SCADA) systems. These fundamental systems can be found controlling and monitoring a wide range of industrial applications, including pipeline operations, electric transmission systems, rail and road systems, municipal water/wastewater infrastructure, and canals, tunnels, and bridges. Because of this range, the roles and usage of SCADA technology can vary considerably across industries and geographic areas.

For this reason, a major focus of ISA112 has been to develop a set of standardized terminology that can be used for specifying, designing, implementing, and managing SCADA systems. The committee has also worked hard to develop an easily applicable ISA112 SCADA life cycle that can be applied to both large and small SCADA systems, regardless of industry.

ISA112 has now released interim drafts of its SCADA life-cycle diagram and reference model architecture as it moves toward an expected first release of a standard by late 2022. That standard will be followed by additional guidance documents such as technical reports. The draft life cycle and reference-model architecture may be downloaded at www.isa.org/isa112. Please send review comments and suggestions to graham.nasby@grahamnasby.com.

ISA112 brings together more than 150 members from a variety of backgrounds, roles, and industries, spanning end users, operating companies, engineering firms, suppliers, distributors, and system integrators across such sectors as municipal water, pipeline, electric power, chemical, mining, environmental, and oil and gas. The committee co-chairs are Graham Nasby and Ian Verhappen.

As in all ISA standards committees, membership is open to any interested individuals. For more information on ISA112, please contact Charley Robinson, crobinson@isa.org.

New standard in the ISA-95 Enterprise-Control System Series (ISA95)

The widely used ISA-95 standards define the integration of control systems with enterprises. A newly published document in the series defines the subset of the standards used for a set of message exchanges for a specific industry or use case.

ISA-95.00.08, Enterprise/Control System Integration Part 8: Information Exchange Profiles, aids in implementations of ISA-95 for application integration. The information exchange profile's intended business usage is within a defined scope for activities, functions, and tasks of ISA-95 Level 3 manufacturing operations management and their exchanges between Level 3 and 4 applications. The information exchange profile references the ISA-95 models, concepts, and terminology defined in ISA-95 Parts 1 through 7.

The new Part 8 provides a coordinated method to apply all parts of the ISA-95 series to reduce the effort associated with implementing new product offerings. The goal is to have manufacturing operations management systems that interoperate and easily integrate, regardless of the degree of automation.

ISA95 is chaired by Chris Monchinski, who also serves as the 2019–20 vice president of the ISA Standards & Practices Department. For more information about ISA95, contact crobinson@isa.org. For information on viewing or obtaining the new standard or other ISA standards, visit www.isa.org/findstandards.

Intelligent Device Management Revisions

ISA-TR108.1, Intelligent Device Management Part 1: Concepts and Terminology, first published in 2015, describes concepts and terminology necessary to understand and communicate effectively about intelligent device management (IDM). It provides overviews of the basic concepts of how intelligent devices can be managed and how such device management plays a larger role in the overall objectives of a facility throughout its life cycle. The document also explains the relationship between IDM and other existing asset management standards.

An updated version of the technical report, revised in a collaboration between ISA108 and IEC SC65E WG10 to reflect improvements in the understanding of the associated technology, has now been published with the designation ISA-TR 63082-1:2020. The new technical report presents a more comprehensive description of the concepts and terminology associated with IDM.

It is the intent of the ISA108 committee to move ahead in its joint work with IEC SC65E WG10 to develop Part 2 of the ISA/IEC 63082 series, which will be a standard based on this Part 1 technical report. Subsequent technical reports and recommended practices are also planned by ISA108, all based on this Part 1 technical report and the anticipated Part 2 standard.

The ISA108 committee co-chairs are Kouji Demachi of Yokogawa Electric Corp. and Herman Storey of Herman Storey Consulting, LLC. The ISA108 managing director is Ian Verhappen of CIMA. For more information about ISA108, contact crobinson@isa.org. For information on obtaining the new technical report, please visit www.isa.org/findstandards.

For more information on ISA Standards, contact Charley Robinson, ISA Standards, crobinson@isa.org .

TECHNICAL ARTICLE

Why Engineers are So Against Derivative Action in PID Tuning

By Gregory McMillan

The following technical 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). Reprinted from http://interchange.isa.org *with permission.*

In the ISA Mentor Program, I provide guidance for extremely talented individuals from Argentina, Brazil, Malaysia, Mexico, Saudi Arabia, and the U.S. This question comes from Brian Hrankowsky, an associate senior consultant engineer at Eli Lilly and Company.

Brian Hrankowsky's Question

Derivative amplifies noise in the measured process value, causes the control loop output to reverse direction before the process has reached setpoint, and causes excessive fast process oscillation. Those are some of the reasons I've been given for never using derivative. In control theory, derivative is taught as a tool to reduce overshoot, improve phase margin (make the loop more robust), and cancel or lead secondary lags. In many tuning algorithms, derivative is set as a function of only the process dead time—implying that it is a good tool for mitigating that, too. I've worked on older (or sometimes just cheaper) systems that had poor PID implementations, which makes me think there were some real control issues solved by setting the derivative to 0. In some conversations, I find the person really just doesn't understand what derivative does. In fact, I had a long discussion with an individual who was convinced derivative was a position controller. A bit of understanding, a modern PID implementation with a correctly set derivative filter, and an ability to control derivative kick enables the use of derivative to get all of the benefits with none of the drawbacks. Why are some engineers so against using derivative action?

Michel Ruel's Answer

To answer, this is a simple question with many folds:

Poor implementation: If the derivative function does not include a filter to limit high gain at high frequencies, then do not use derivative, since noise will be amplified and sent to the controller output. If this filter is adjustable, it should be around one-tenth of derivative time which corresponds to limit derivative gain at 10. In some systems, this filter is a second-order Butterworth filter which really improves the usage of derivative when noise is present. Most loops should be configured using derivative only on PV changes (and not on error changes) to avoid a kick at the controller output on SP change. In some PLCs, when switching from manual to automatic, the calculation of derivative is wrong and it generates a large change at the controller output (calculation of rate of change using last scan in automatic). In some implementations, the calculation of the rate of change is poorly done. In some implementations, improper derivative function interferes with the anti-reset wind-up algorithm and becomes a disaster!

Improving robustness: Derivative improves phase margin, true. Derivative can cancel a small time constant (e.g., if the model is a second-order plus dead time, set derivative at the value of the small time constant to cancel it). If a multiple time constant, set derivative at the value of the largest of small time constant to cancel it. If a first-order plus dead time, set derivative at ~0.5 of equivalent dead time (usually in fact a real dead time + small time constants).

Derivative reacts to rate of change: When tuning a loop for disturbance rejection, derivative will react before the error increases since it "sees" this error increasing by reacting to the slope.

Improving response on SP change: If SP is manipulated by another system (or MPC), derivative will improve response if properly adjusted. Avoid ramp; I prefer using a SP filter.

Impacts of derivative: When using derivative, you can use more proportional gain (derivative improving phase margin) and more integral action. The benefits are less overshoot, a faster response, and being more robust.

Greg McMillan's Answer

In going from a *Series* or *Real* Form in migration projects to newer systems that have an *Ideal* or *Standard* Form, people may not know that a rate time setting greater than ¼ the reset time setting will cause oscillations that get quite bad if the rate time is larger than the reset time. People don't realize the inherent protection of a rate time greater than ¼ the reset time in the Series Form. This confusion can lead to people turning off derivative action.

People don't like sudden changes in controller output even though this provides pre-emptive action and reduce the dead time from dead band and resolution limits. People prefer the gradual action from the integral mode that is always moving in the direction to eliminate an error seen on digital display no matter how small and despite whether the trajectory shows overshoot is eminent. Also, amplification of noise by derivative action turns people off. Instead of reducing noise by a better installation, filtering, or rate limiting, users play the blame game of outlawing derivative. Education and demonstration by the use of the digital twin can help a lot to show the value of derivative and how to enable derivative to do its job without upsetting other loops or wearing out the control valve.

If movement of the controller output signal is too fast, putting a simple setpoint rate limit on the analog output block or secondary PID and simply turning on PID option external-reset feedback (e.g., dynamic reset limit) with proper connection of the manipulated variable can prevent the fast change without the need to retune the PID controller.

A PID structure of PI on Error and D on PV or a 2 Degrees of Freedom (2DOF) structure can eliminate the bump from derivative action for a setpoint change. However, in some cases this bump is useful in helping a secondary PID have a faster response particularly getting through valve dead band and stiction faster to help the primary controller in cascade control. Usually, oscillation in the secondary loop is filtered by a larger process time constant in the primary loop, which normally occurs if the cascade rule is adhered to where the secondary loop is at least five times faster than the primary loop.

The elimination of noise by a better filter or a better installation, as described in the *Control* article "Why and how of signal filtering," can provide much more. In this article, seemingly insignificant noise caused a lot of valve movement due to high PID gain and rate action for this integrating process. What was not considered is that fluctuations in controller output with a peak amplitude less than the dead band or resolution limit normally causes no movement. Pneumatic actuated control valves have a dead band of at least 0.2% for the best true throttling valves with sensitive diaphragm actuators and positioners. The dead band can be possibly as large as 20% for on-off valves posing as throttling valves. The strange story here is that the "poser" will *not* wear out so fast when it would be better if it did, so you might buy a true throttling valve.

If on approach to setpoint, the process variable (PV) reverses direction before reaching setpoint, the derivative action is most likely too large.

I have used derivative action in most temperature loops where it helps cancel out a thermowell or heat transfer surface lag. For highly exothermic batch reactors, derivative action is essential to prevent acceleration and shutdown. In some chemical plants I worked in, the temperature controllers were proportional plus derivative (PD on error no I) because derivative action was critical and integral action was detrimental.

I have seen specialists in refinery controls concentrate more on minimizing the movement of the manipulated variable (MV) than movement of the PV possibly due to the interactions in heat integration particularly for inline systems (smooth gradual minimal MV changes being the goal).

See the ISA Mentor Q&A posts "When and How to Use Derivative Action in a PID Controller" and "Key Insights to Control System Dynamics."

Mark Darby's Answer

One of the challenges with derivative comes about when using a pure trial and error tuning approach—i.e., having to determine three tuning parameters: the derivative time in addition to gain and integral time. But the task is simplified with the advice given above. Derivative is most useful when applied to lag dominated, higher ordered processes (with or without dead time). When tight control is important, PID is worth pursuing. It can reduce IAE (integral absolute error) by 0.5 or more. One can set the derivative time, as Greg suggests in our recent article on filtering, equal to the secondary time constant or ½ of the dead time, whichever is largest. Be aware that if the process gain is overestimated, the controller gain will be underestimated, possibly leading to ineffective derivative action besides proportional action. For this reason, when using a tuning rule, a tuning package result, or trial and error tuning, it can be useful to determine if the controller gain is set high enough for the derivative action to be effective. To test: turn off derivative action (set derivative time to zero). One should see a damped oscillatory response that is not there with derivative action; if not, the gain can be increased. Alternatively, one can set the derivative time initially to 0 and increase the gain until a damped cycle is observed, then dial in derivative to eliminate the cycle. This approach assumes the integral time is not set too small. If the settling time is much larger than 10 times the dead time with an oscillation period about three to four times the dead time, the derivative time may be too small.

Additional Mentor Program Resources

See the ISA book *101 Tips for a Successful Automation Career* that grew out of this Mentor Program to gain concise and practical advice. See the *InTech magazine* feature article Enabling new automation engineers for candid comments from some of the original program participants. See the *Control Talk* column How to effectively get engineering knowledge with the ISA Mentor Program protégée Keneisha Williams on the challenges faced by young engineers today, and the column How to succeed at career and project migration with protégé Bill Thomas on how to make the most out of yourself and your project. Providing discussion and answers besides Greg McMillan and co-founder of the program Hunter Vegas (project engineering manager at Wunderlich-Malec) are resources Mark Darby (principal consultant at CMiD Solutions), Brian Hrankowsky (consultant engineer at a major pharmaceutical company), Michel Ruel (executive director, engineering practice at BBA Inc.), Leah Ruder (director of global project engineering at the Midwest Engineering Center of Emerson Automation Solutions), Nick Sands (ISA Fellow and Manufacturing Technology Fellow at DuPont), Bart Propst (process control leader for the Ascend Performance Materials Chocolate Bayou plant), Angela Valdes (automation manager of the Toronto office for SNC-Lavalin), and Daniel Warren (senior instrumentation/electrical specialist at D.M.W. Instrumentation Consulting Services, Ltd.).

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 was also an affiliate professor for Washington University in Saint Louis. Greg is an ISA Fellow and received the ISA Life Achievement Award in 2010, among many other industry recognitions.

TECHNICAL ARTICLE

SCADA System Development Block Diagrams
A Tool for Visualizing SCADA Workflow

By Brian Mast, Copper Bell Consulting LLC

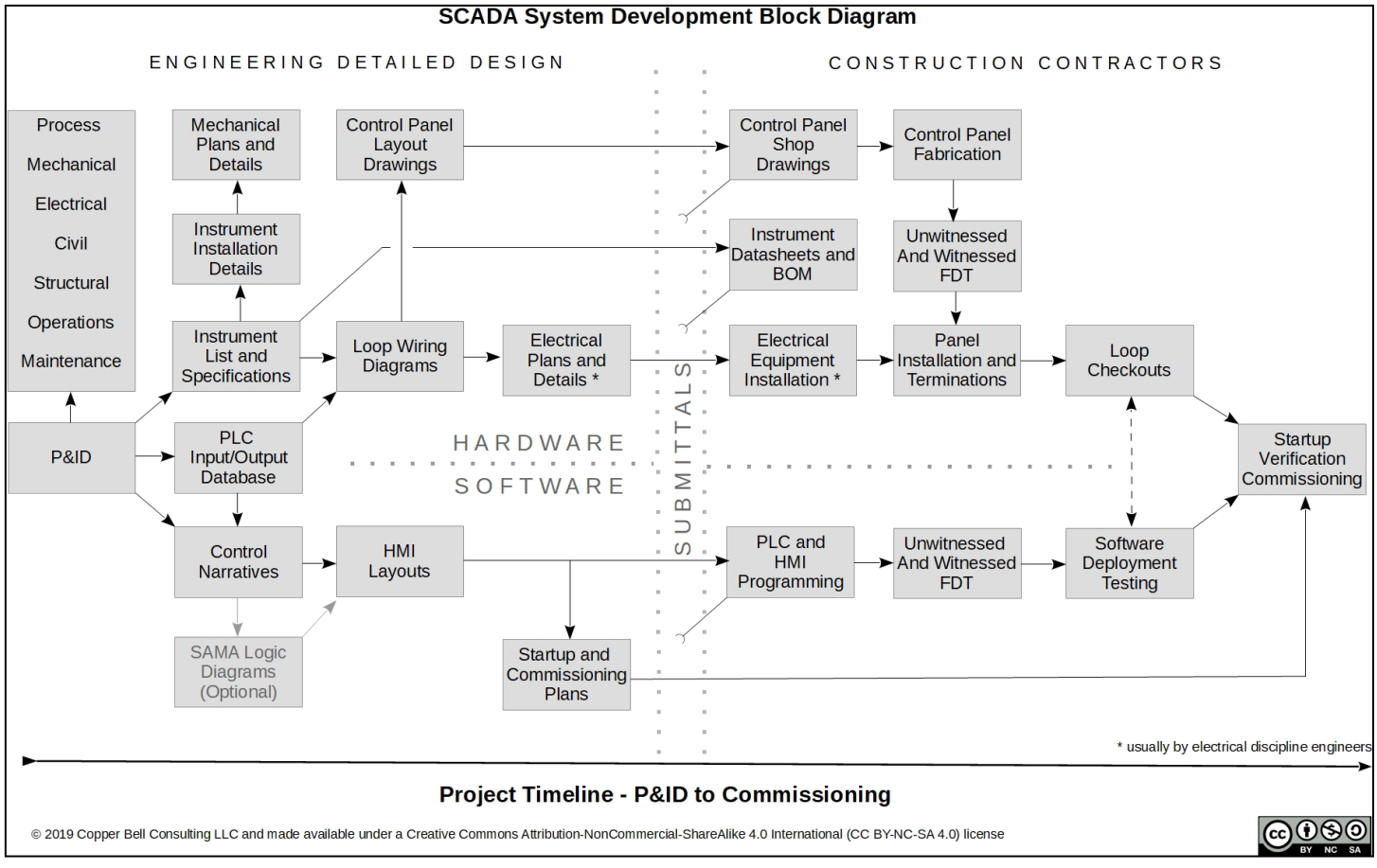
Many instrumentation and controls (I&C) engineers struggle to explain the concept and details of control system design to their project team members, and particularly to managers from other disciplines. Figure 1 represents an attempt to capture the major phases of a supervisory control and data acquisition (SCADA) system design and implementation. Although Figure 1 assumes a design-bid-build model, other project delivery methods could be detailed in a similar fashion. In addition, the graphic could be expanded to include more detailed task boxes and workflows.

The diagram is divided into a number of sections. The zone on the left shows engineering detailed design and its functional tasks; the zone on the right shows construction contractor work with associated tasks. The area marked "submittals" is the workflow buffer between the two zones. The diagram is also divided vertically (i.e., by the x-axis) to show hardware tasks on top and software tasks on the bottom. Note that the hardware and software tasks only directly converge at the beginning box marked "P&ID" (explained below) and the input/output (I/O) database, and then at the end in loop checkouts and startup verification commissioning. Often, two different teams, both the hardware team and the software team, are sharing this design structure.

The P&ID provides the basis for not only the SCADA control system, but for the work of most of the other disciplines. There are essentially two forms of P&IDs: (1) a *process* and instrumentation diagram and (2) a *piping* and instrumentation diagram. The main difference is that the first type (process) shows most things except for every piece of piping, while the second type (piping) — these are often used in chemical industries, for example — show every valve, tap, and major fitting, complete with line segment numbering, right down to the heat trace. In the water and wastewater industries, sometimes P&IDs of either kind are not used faithfully.

Regardless of the specific type used, all designs should start from a P&ID. This is the foundational document for even a small project, such as adding a float switch. It can show its interlocks, signal direction, control panel, I/O, physical location in the process, and more. It also feeds into the other disciplines (typically civil, structural, mechanical, and electrical), as well as operations and maintenance (O&M) manuals, depending on its purpose.

At one time, the project role of an I&C engineer was limited enough to show nearly the entire I&C contribution completely on a single P&ID sheet. The lines and symbols on a P&ID are optimized for plants with pneumatics, hardwired interlocks, relay panels, and interfaces to local human-machine interfaces (HMIs) and I/O to larger distributed control system (DCS) or programmable logic controller (PLC) software controls. In our current design environment, the complete software logic and functional programming in that sphere is mostly *not* shown on



a P&ID but rather in control narratives, I/O lists, software block diagrams, and SCADA HMI graphics.

The key electrical task boxes, shown in the middle of Figure 1 and noted with asterisks, are intended to capture the electrical work in sequence with the control system engineering. (Like Sinatra's love and marriage, you can't have one without the other!)

Moving across time from left to right on Figure 1, the various tasks build up and interrelate to show which task feeds the next. It would be possible to portray the same information in a Gantt chart; however, that would require dates, task lengths, and a demonstration of dependencies in a more linear fashion than is often the case.

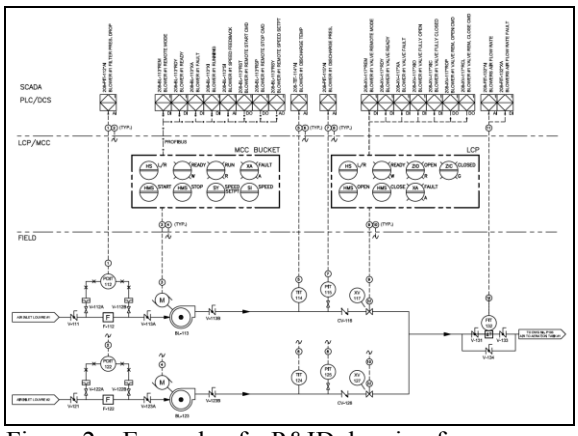


Figure 2 – Example of a P&ID drawing for a process

The optional Scientific Apparatus Makers Association (SAMA) functional logic diagrams, shown as a shaded box in the lower left of Figure 1, are part of an old and discontinued standard from the 1970s and 1980s. They are no longer commonly used, but they could be part of existing documentation in a facility. They are still used in the power generation industry. Custody of SAMA standards is with the Measurement, Control & Automation Association (MCAA), and they can be obtained at https://themcaa.org/industry-insight/standards (follow the link "Functional Diagramming of Instrument & Control Systems").

In conclusion, distributing a copy of a diagram such as that contained in Figure 1 to the design project team — as well as to the client's management — early on in the design phase should aid in common understanding of the interests and concerns of the I&C engineer and result in a more successful project delivery overall, with lower cost of change orders and remediation due to testing failures.

About the Author

Brian Lee Mast, PE, is a control systems engineer practicing as Copper Bell Consulting LLC in Seattle. He is a contributing member of ISA112 SCADA Systems standards committee. He currently serves as treasurer, and previously served as president, of the ISA Seattle Section. Contact: brian@copperbell.net.

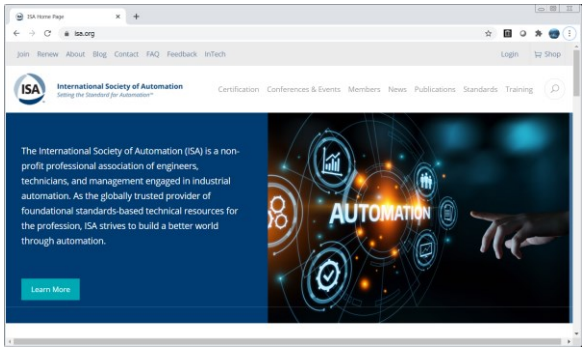
ISA SOCIETY NEWS

ISA Launches new website: www.isa.org

From ISA news release

We are pleased to announce that the ISA website at www.isa.org now has a fresh new look with new capabilities! This relaunch was designed with you in mind. As you browse, you will find improvements for the benefit of long-time and new users alike, such as:

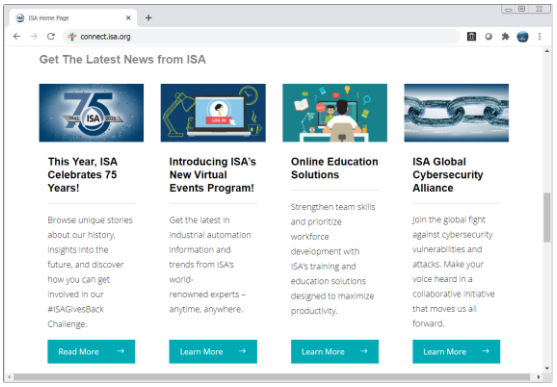
- **Better search capabilities**, including intelligence-driven results
- **Mobile-friendly capabilities**—enjoy all of our content via your smartphone or tablet
- **A better e-commerce experience**, with helpful search and indexing to guide you to the right items
- **Expanded capabilities in the join and renew process**, validating your individual interests



We have set up a Frequently Asked Questions page where you can review information about where to find things and how to use the site. Please let us know what you think of our new online experience by filling out our feedback form. Your thoughts will help us greatly.

During this transition, please note that you may experience some delays in order processing or experience longer wait times to speak with our Customer Service team. Thank you for your patience during this period of adjustment. If you have any problems or questions, we encourage you to reach out to us. We are listening!

Thanks again, and please enjoy the new, relaunched ISA.org.



TECHNICAL ARTICLE

ISA112 SCADA Systems Lifecycle Released

Graham Nasby, City of Guelph Water Services

Since its kick off in September 2016, the ISA's newest standards committee ISA112 SCADA Systems has been hard at work developing a new standard to cover best practices for the design, implementation, and long term management of SCADA systems. Supervisory Control and Data Acquisition systems, commonly referred to as SCADA systems, are a critical aspect of automation technology for a wide range of industries. SCADA plays a major role in controlling/monitoring pipelines, electric transmission systems, rail/road systems, canals/tunnels/bridges and municipal water/wastewater infrastructure, along with many other industrial applications. The role and usage of SCADA technology can vary considerably depending on the specific industry and geographic area.

After several years of work, the ISA112 committee is pleased to release interim drafts of its ISA112 SCADA lifecycle and ISA112 reference model architecture, which are now available for download on www.isa.org/isa112 . The committee is expecting to have the first release of the ISA112 SCADA systems standard ready in 2022-23, which will be followed by several additional work products including technical reports. Like many of ISA's popular standards, it is expected the ISA112 SCADA systems standard will be published in several parts due to its breadth.

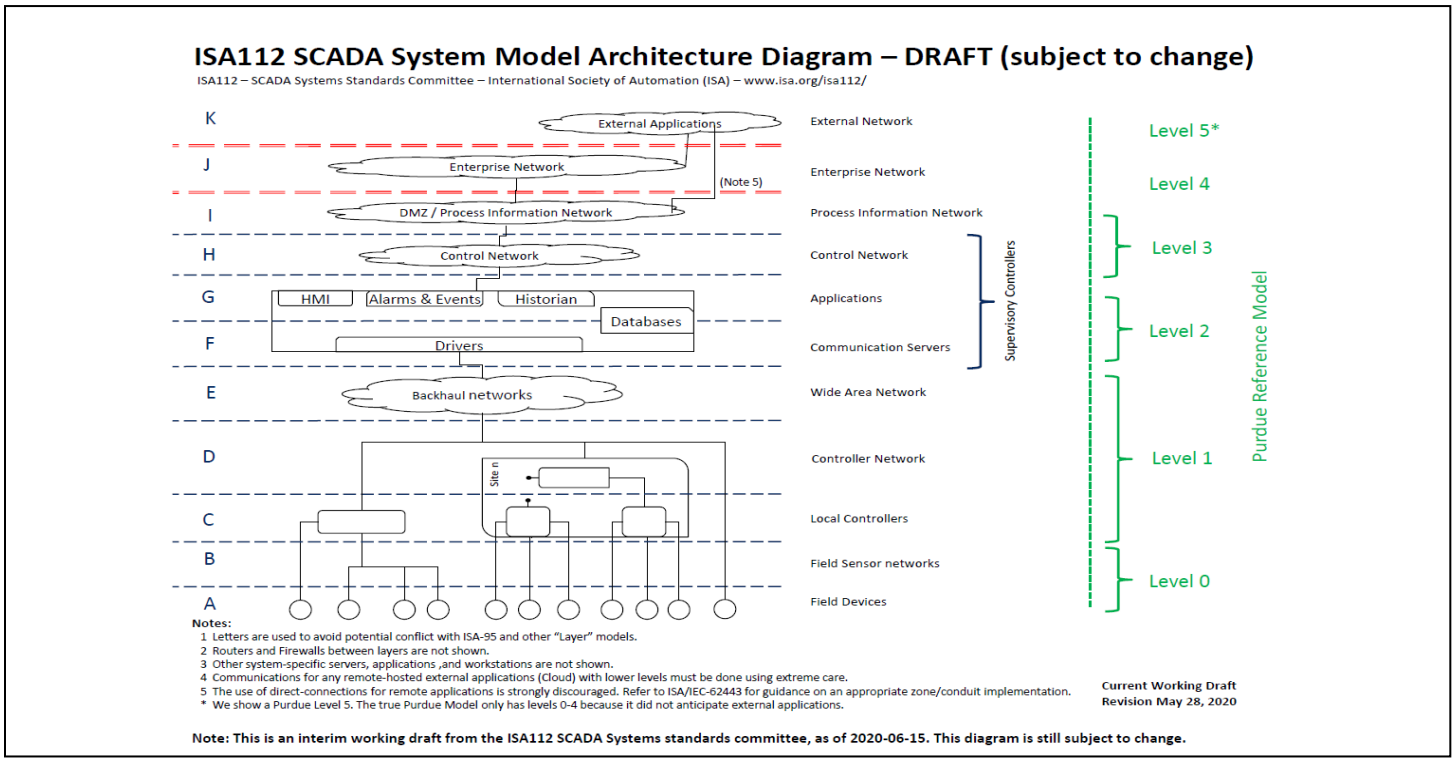
There is a strong drive by the ISA112's members to develop a set of standardized terminology that can be used for specifying, designing, implementing and managing SCADA systems. The committee has also worked hard to develop an easily applicable ISA112 SCADA lifecycle that can be applied to both large and small SCADA systems, regardless of the industry and geographic area.

Headed by co-chairs Graham Nasby and Ian Verhappen, the ISA112 committee currently has over 150 members from a wide variety of backgrounds, roles and industries. The committee has a strong cohort of members that includes end-users, operating companies, engineering firms, vendors, distributors, contractors and system integration outfits. The co-chairs, along with managing director Greg Lehmann, have worked hard to ensure the committee membership has broad representation from a wide span of sectors, including the municipal water/wastewater, pipeline, electric power, chemical, mining, environmental, and oil/gas industries.

Membership in the ISA112 SCADA Systems Standards committee is open to any interested individuals. Comments and feedback are also always welcome. You can find your more about the ISA112 committee by visiting **www.isa.org/isa112** or by contacting co-chairs Graham Nasby or Ian Verhappen.

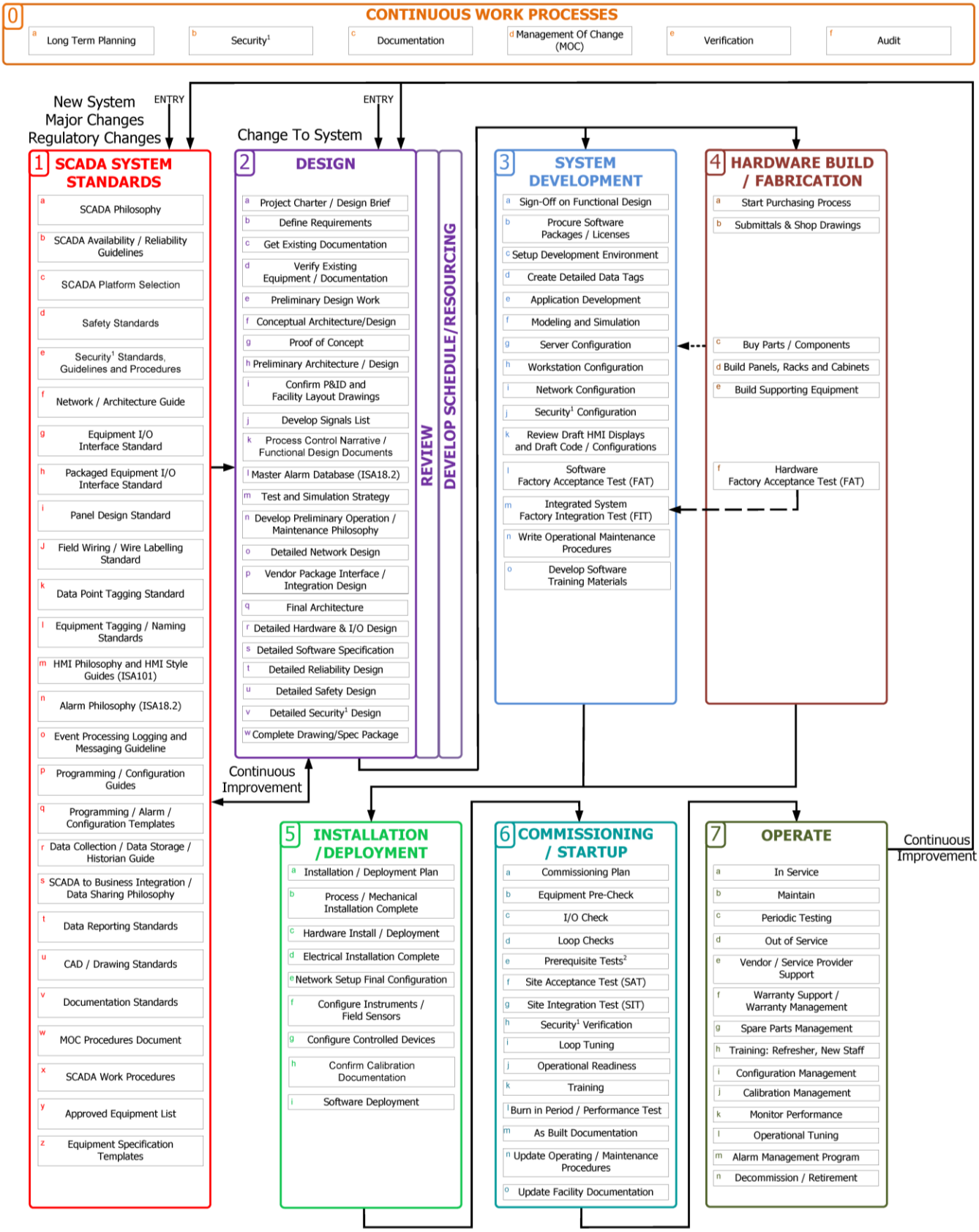
About the Author

Graham Nasby, P.Eng, PMP, CAP holds the position of Water SCADA & Security Specialist at City of Guelph Water Services, a publicly-owned/operated water utility located in Guelph, Ontario, Canada. Prior to joining Guelph Water, he spent 10 years in the engineering consulting community after completing his B.Sc.(Eng.) at the University of Guelph. He is senior member of the International Society of Automation (ISA) and co-chair of the ISA112 SCADA System Standards Committee. Contact: graham.nasby@guelph.ca



ISA112 SCADA System Lifecycle – DRAFT (subject to change)

ISA112 – SCADA Systems Standards Committee – International Society of Automation (ISA) – www.isa.org/isa112/



Notes
1) Security includes physical security, operational security and cybersecurity.
2) Prerequisite tests typically include both cold and hot commissioning or dry / wet commissioning as applicable.

ISA112 Lifecycle Diagram
Current Working Draft
Revised June 15, 2020

Note: This is an interim working draft from the ISA112 SCADA Systems standards committee, as of 2020-06-15. This diagram is still subject to change.

AUTO-QUIZ: BACK TO BASICS

Reynolds Number Review

This automation industry quiz question comes from the ISA Certified Control Systems Technician (CCST) program. CCSTs calibrate, document, troubleshoot, and repair/replace instrumentation for systems that measure and control level, temperature, pressure, flow, and other process variables

Question:

The Reynolds Number for a flowing fluid is most affected by which of the following parameters?

a) viscosity
b) pressure
c) friction factor
d) temperature
e) none of the above

Answer:

The Reynolds Number for a flowing fluid can be generalized as the ratio of kinetic (or inertial) forces divided by viscous forces. Although friction factor and temperature do affect inertial forces and viscosity to some degree, and therefore, Reynolds number, viscosity has the most direct effect upon the value of the Reynolds Number.

The correct answer is A, "viscosity."

Reference: Goettsche, L.D. (Editor), Maintenance of Instruments and Systems, 2nd Edition

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 AutoQuiz column of http://automation.isa.org. Reprinted with permission.

SOCIETY NEWS

Progress Continues in a Challenging Year

By Eric Cosman 2020 ISA Society President

As we all continue to cope with the pandemic, I hope that this finds you, your family, and friends safe and well.

It continues to be a challenging year for all of us, as well as for our Society. Nonetheless, we are still moving forward, and I want to use this opportunity to remind you of some recent developments and important milestones, and to share some of the themes that I have heard.

Let's start with the results of our recent election. I hope that you were able to exercise your franchise and help us to elect a new slate of Society leaders. If not, please make a note to yourself to participate next year, as this is your opportunity to help set our direction. I congratulate Carlos Mandolesi on his election as President-Elect for 2021. I've had the pleasure of working with him for several years and I am excited that he is joining the presidential chain. I also offer my congratulations to those elected to the Executive Board. Some are new, and some are returning, perhaps in slightly different roles. I believe that we have an excellent balance of continuity and new faces on the Board for 2021 and beyond.

Our Society has also selected our award winners for 2020. Although we will not be able to have formal award presentations this year, we will do all that we can recognize these accomplishments. As part of this process, we have named several new ISA Fellows. I extend my personal congratulations to Donald Dunn, Donald Rahn, John Sorge, and Richard Van Fleet. This is a recognition of their significant accomplishments and contributions to our Society and the automation profession.

We have other significant milestones coming this year. After some delays we are all looking forward to the launch of a new Society web site, with associated better tools for collaboration. Many of you have heard about the new collaboration tools that we will have as part of ISA Connect, which is scheduled to be available in late August. Some of you have no doubt been among the "early adopters." While the availability of the tool is certainly important, this is only a prerequisite for improved collaboration and information sharing. To get the full benefit of this new capability, we will all have to consider how we collaborate and perhaps change some of our work processes. For example, posting to the discussion groups on ISA Connect can be much more effective and inclusive than email.

Let's not forget about our 75th anniversary celebration. Although we have had to make some changes to our plans in the face of the pandemic, many aspects are proceeding unchanged. Our 75 in 2020 website has links to information about the program. One important initiative is ISA Gives Back, where we encourage all of members to consider pledging at least 7.5 hours in service to their community this year. Those participating can also submit photos of their activities. This is a great way to contribute to the community and raise awareness of our Society.

In my previous messages, I have written about our proposed changes to Society bylaws. These will be put to the Council of Society Delegates (CSD) for vote later this year. As we have reviewed them with various stakeholder groups, there are several themes that have emerged. Perhaps the most fundamental of these has to do with the relationship between the Society and its sections.

Several people have asked about how our proposed changes might change the way in which sections conduct their business. The short answer to this question is "Not at all." Sections have an affiliation relationship with the Society that permits them to use our brands and intellectual property for mutual benefit. They also have an important governance role through their representation on the CSD. However, they are independent legal entities with a great deal of latitude with respect to how they conduct their regular business, subject to Society bylaws.

This has been a valuable and successful partnership since the Society was formed, and it continues to be one of the backbone concepts of our organization. Sections are a major source of our strength, providing leaders who go on to fill even larger roles in ISA. They also keep us grounded in serving the needs of our profession in the various geographical areas.

There is another theme that has arisen frequently in various conversations. It has to do with how our members can find opportunities to contribute to activities at the Society level. Current leaders often hear statements like "I was not aware of that" or "How can I get involved?"

These questions appear to indicate that there are opportunities for improvement in our communication to members about available opportunities. Fortunately, ISA Connect, in addition to allowing us to engage in technical discussions, also allows us to search for and be matched with opportunities to get involved. As Connect launches, you will have the opportunity to complete a volunteer profile. This is an important first step. Tell us how you are interested in engaging so that we can find opportunities for you. With the full power of our members, we are better enabled to advance the Society.

As you can see, we have made considerable progress with respect to our strategy this year and are well-positioned to continue in this direction. As we do every year, we will be reviewing our strategic plan later this year and making any adjustments required. If you have questions, concerns, or suggestions about our plan—or anything else about the Society's direction—I encourage you to submit your thoughts via email to President@isa.org.

Stay safe.

Eric Cosman
2020 ISA President

Call for Newsletter Articles

The WWID newsletter is published four times a year (winter, spring, summer, and fall) and reaches the WWID's over 1,600 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.isa.org/wwid/.

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 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.

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