

GRAHAM NASBY, P.Eng., FS Eng., PMP, CAP

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PROFILE

Project Manager and Automation Engineer

Graham Nasby is an industry-recognized leader in the water/wastewater community for his efforts with PLC/DCS/SCADA systems, standards development, raising cybersecurity awareness, and alarm management. Through his work with the International Society of Automation (ISA) and IEC, he has coauthored international standards in alarm management, cyber security, and HMI (human machine interface) design. He has also worked with the ISA, American Water Works Association, Water Environment Federation, and other industry groups to author numerous articles on PLC and SCADA best practices. He has also acted a general symposium chair, program committee chair, and moderator for numerous industry events.

As a project manager and technical leader, Graham works at the forefront of the automation, controls, SCADA, and Instrumentation communities. He frequently publishes both technical papers and industry opinion pieces, and is a frequent speaker at conferences. In addition to having exceptional skills in technical writing and presentation delivery, Graham excels at user needs assessment and project management. Graham also has considerable experience with long term facilities planning, capital project delivery, and managing consultants and contractors. At present, Graham is responsible for the long-term planning, design, construction/implementation, and commissioning of automated control systems for the City of Guelph Water Services. Before he joined the city, he spent 10 years with various consulting firms providing master planning, standardization, and control system design/implementation services for a variety of industries.

SPECIALTIES

project management | program planning | long-term & master planning | condition assessments | budgeting/scheduling
multi-discipline coordination | construction sequencing | contract set preparation/review | tendering | contract admin.
presentations | technical reports | meeting facilitation | field supervision | managing union & non-union environments

automated control system design | SCADA/HMI systems | network/routing design | instrumentation | electrical design
cybersecurity design and best practices | alarm management | high performance HMI | safety instrumented systems
front-end and detailed design | engineering drawings/specs | commercial/technical evaluations | earned value analysis
water/wastewater treatment systems | process systems | startup/commissioning | on-site troubleshooting | negotiation

LICENSURE & CERTIFICATION

P.Eng., Professional Engineer – Professional Engineers Ontario (PEO) – since 2010

PMP, Project Management Professional – Project Management Institute (PMI) – since 2010

CAP, Certified Automation Professional – International Society of Automation (ISA) – since 2012

FS Eng., Functional Safety Engineer: Safety Instrumented Systems – TÜV Rheinland – since 2014

Water Treatment and Water Distribution and Supply Operator Licenses – Ontario Water/Wastewater Certification Office

Wastewater Collection and Wastewater Treatment Operator Licenses – Ontario Water/Wastewater Certification Office

INDUSTRY RECOGNITIONS

Standards Excellence Award (2021), International Society of Automation

For exceptional leadership and/or technical knowledge essential to the organization, development and/or administration of ISA standards to advance the mission of the Society. For contributions to the ISA112 SCADA systems standard, and to the ISA18 and ISA101 series of standards.

Mid-Career Achievement Award (2014), School of Engineering, University of Guelph (Guelph, Ontario, Canada)

Recognizes an alumnus who has graduated from the University of Guelph in the last 10 to 25 years, and who has earned respect within the profession and in the broader community, and one who has already attained significant achievement and gives promise to future contributions.

Volunteer Leader of the Year (2013), International Society of Automation

Technical Division Leader of the Year (2013), ISA

The ISA has 30,000 members world-wide. One award is given out per year at the ISA Annual Awards Gala (Nashville, TN, USA in 2013). Recognized for revitalizing a struggling technical conference, committee work, and contributions to municipal water/wastewater sector.

Nominated for the 2012 Allen D Williams Award, Association of Consulting Engineering Companies – Canada (ACEC).

National award program in Canada for promising young professionals (under 35) in consulting engineering. One award is given out annually.

Keith Otto Award (2011), ISA

For best article of the year in ISA InTech magazine. "SCADA Standardization: Past, Present and Planning for the Future," May/June 2011

Best Paper (2011), 6th Annual ISA Water/Wastewater and Automatic Control Symposium. June 22-24, 2011.

Leaders Under 40: Class of 2011, Control Engineering Magazine (2011)

Featured in the October 2011 issue of Control Engineering.

RECENT PUBLICATIONS

Presentations

- Nasby, G. (2018) "Using DNP3-WITS Telemetry Standards to Efficiently Collect Pressure and Flow Data from District Metered Areas: The Canadian Experience." Global Leakage Summit. Mar 13-14, 2018. Marble Arch, London, UK. Invited Speaker.
- Nasby, G. (2017) "Current Trends in SCADA Systems: Situational Awareness, Alarm Management, Data Availability and System Redundancy." OWWA Source to Tap Workshop. Ontario Waterworks Association. Oct 2, 2017. Timmins, Ontario. Invited Speaker.
- Nasby, G. (2015) "Applying ISA-18.2 Alarm Management to SCADA Systems." WEFTEC 2015. Sept 26-30, 2015. Chicago, Illinois, USA.
- Nasby, G. (2012) "Automation Master Planning & Developing Effective Automation Standards for your Facilities." 2012 ISA Automation Week. Sept 24-27, 2012. Orlando, Florida, USA.

Articles

- Nasby, G. (2019) "Keeping the Water On: How Engineers Can Help the Municipal Water Sector." Civil & Structural Eng'r. Nov 2019. pp. 28-29.
- Nasby, G. (2018) "ISA112 Committee Releases SCADA System Workflows & Architectures." ISA W/WW newsletter. Winter 2019. pp. 8-10.
- Nasby, G. (2014) "Workforce Development: It's a Team Effort." ISA InTech magazine. Aug/Sept 2014. p. 46.
- Nasby, G. (2013) "Trouble Justifying Automation Investments? Talk to Operations." ISA InTech magazine. Jul/Aug 2013. p. 82.
- Nasby, G. (2012) "Using Process Flow Sheets as Communication Tools." Chemical Engineering Progress (AIChE). Oct. 2012. pp. 36-44.

Technical Reports / Standards

- ANSI/ISA-84.91.01-2021 "Identification and Mechanical Integrity of Process Safety Controls, Alarms, and Interlocks in the Process Industry Sector."
- ISA-TR18.2.2-2018: "Alarm Identification and Rationalization."
- ANSI/ISA-18.2-2016 & IEC-62682 "Alarm Management for the Process Industries."
- ANSI/ISA-101.1-2015 "Human Machine Interfaces."
- ISA-TR18.2.4-2012 "Enhanced and Advanced Alarm Methods."

A full list of publications is available on www.grahamnasby.com under Publications.

PROFESSIONAL CONTRIBUTIONS

Committees:

Co-Chair, ISA112 "SCADA Systems" standards committee (2016 - present)

Leading a committee of 250 industry experts to develop a new SCADA systems management standard. Expected publication in 2023.

Voting Member, ISA101 "HMI Design" standards committee (2011-present), voting member since 2017

Co-author of the recently released ANSI/ISA-101 HMI Design standard. Currently working on four technical guidance reports.

Voting Member, ISA18 "Alarm Management" standards committee (2010 – present), voting member since 2012

Responsible for maintenance of ISA-18.2 alarm management standard, facilitating the adoption of ISA-18.2 to the IEC-62682 standard
Currently co-author of 6 of the committee's technical reports on implementing the 18.2 alarm management standard

Committee Member, SCC/IEC-TC65: "Industrial Process Measurement, Control and Automation" standards committee

Member of the Canadian National Committee for the IEC TC65 working group, as part of the Standards Council of Canada (SCC).
Named Canadian expert on "alarm management" for IEC Technical Committee TC65/SC65A Working Group 15.

Voting Member, P125 Functional Safety Standards Committee, Canadian Standards Association (2019 – present)

CSA Technical Committee on Operational and Technology Functional Safety and Security. Binational committee under SCC and ANSI.

Automation and Information Technology Committee, Water Environment Federation (2012 – present)

Cybersecurity Sub-committee, American Water Works Association (2017 – present)

OWWA Automation Committee, Ontario Waterworks Association (2015 – present)

Newsletter Editor, ISA Water/Wastewater Technical Division, International Society of Automation (2013 – present)

Formerly held positions:

Vice-President – Industries and Sciences, International Society of Automation (2016-2017 VP-elect, 2018-2019 VP)

Oversee 10 of the ISA's global technical divisions, including technical divisions for seven different industry sectors.

Co-Chair, ISA18 WG7 "Alarm Management for Packaged Systems" standards working group (2012 – 2017)

Led a committee of 40 engineers from around the world to developing a consensus-based technical report that was published in 2017.

Director, ISA Water/Wastewater Technical Division (2013-2015), Director-elect (2011-2012), Marketing Chair (2010)

Overseeing member services including the quarterly newsletter, annual symposium, student awards program for 2000 members

President, ISA Hamilton Section (2014), VP & President-elect (2012-2013), Membership Chair (2011)

Recruiting, motivating and coordinating volunteers for local events (tours, speakers, annual Expo trade show, golf tournament, etc.)

General Symposium Chair – 2012 & 2013 ISA Water/Wastewater and Automatic Controls Symposium

Political Action Network Volunteer – Ontario Society of Professional Engineers (2006-2013)

MEMBERSHIPS

PMI - Project Management Institute | ISA - International Society of Automation - Senior Member | IEEE Control Systems Society
IEEE - Institute of Electrical and Electronic Engineers – Sr. Member | ACM - Association for Computing Machinery – Sr. Member
WEF - Water Environment Federation | WEAO - Water Environment Assoc. of Ontario | AWWA - American Water Works Assoc.
OWWA - Ontario Waterworks Association | AIChE - American Institute of Chemical Engineers | OPSE – Ontario Soc. Prof. Eng'rs

WORK EXPERIENCE

Water SCADA & Security Specialist (2015 – present)

CITY OF GUELPH, WATER SERVICES – Guelph, Ontario, Canada

Water Services provides Guelph's 140,000 residents and businesses clean, safe and high-quality drinking water from a distributed ground water system that encompasses some 35 water facilities and over 600 km of distribution piping.

Responsible for the design, planning, implementation, and maintenance of the automatic control systems that ensure Guelph continues to have a clean, safe, high-quality, and robust drinking water system. This includes process control systems, instrumentation, historical data collection, reporting systems, cybersecurity and physical security. My role also encompasses developing and maintaining the SCADA master plan; overseeing and planning SCADA capital upgrades; and the development/maintenance/enforcement of SCADA and security standards across the city's numerous water facilities.

Sessional Instructor, Evenings (2017 – present)

McMASTER UNIVERSITY, Faculty of Engineering – Hamilton, Ontario, Canada

As part of the degree completion program (DCP), I teach an evening course on law and ethics for engineers

CONESTOGA COLLEGE, Applied Electrical Motion and Control Management Program – Kitchener, Ontario, Canada

As part of their technical programs, I teach evening courses on electrical theory and PLC programming (ControlLogix).

MOHAWK COLLEGE, Marshall School of Skilled Trades & Apprenticeship – Stoney Creek, Ontario, Canada

As part of the 847 Fluid Power trade school program, I teach an evening course on pneumatic controls and Siemens PLCs.

Guest Instructor (2017 – present)

FLEMING COLLEGE, School of Environmental & Natural Resource Sciences (Frost Campus) – Lindsay, Ontario, Canada

Teaching as a guest instructor for their Advanced Water Systems Operations and Management (AWSOM) program.

Instrumentation & Controls Lead (2013 – 2015)

System Integrator (2010 – 2012)

ERAMOSA ENGINEERING INC. – Guelph, Ontario, Canada

Eramosa is a consulting engineering firm that provides system integration, electrical engineering, and SCADA master planning services.

Began role as a system integrator, focusing in PLC/RTU programming, HMI development, and plant start-ups. Soon moved into doing I&C design, electrical design, and preparing tender specifications/drawings for large SCADA retrofit projects. Oversaw junior designers and acted as a reviewer. Developed I&C and electrical scopes of work and SCADA designs for sewage lift stations, water plants, water towers, and pumping stations. Managed Projects. Contract Administration.

Sample Projects:

- **Region of York Alarm Management Implementation** – Facilitated implementation of the ISA-18.2 alarm management standard, including developing an alarm philosophy and alarm rationalization for 160 water/wastewater facilities.
- **Cayuga Water Pollution Control Plant: Capacity Increase and Upgrade** – Developed control narrative and designed/programmed the new SCADA system. Directed the 4-month plant start-up as on-site project manager.
- **Regional Municipality of York – SCADA standards and Pilot Site Integration:** Undertook a complete review/update to Division 13 I/C specs, standard, and guidelines. Developed new HMI/PLC programming, screen and tagging standards.
- **City of Hamilton, SCADA Master Plan Project** – Led the detailed I&C design, construction and start-up for 25 facilities.

Controls and Commissioning Lead (2008 - 2010)

Controls Specialist (2007 - 2008)

CHEME ENGINEERING – Campbellville, Ontario, Canada

Cheme is a consulting engineering firm providing process engineering, commissioning, and validation services for the pharma industry.

Began role by writing functional specifications (process control narratives) and managing system integrators. Soon started doing process design, sizing/selecting equipment, preparing drawings/specs, coordinating with other disciplines/firms, leading HAZOP reviews, preparing tender packages, commercial/technical evaluation of bids, shop drawing review, contract admin, site inspections, and leading commissioning/start-up. Role also included identifying client needs, leading client meetings, writing proposals, and managing projects. Most work was pharma-related: USP Purified Water (PW), Water for Injection (WFI), Pure Steam, pH Neutralization, solids removal, compounding, and waste treatment systems.

Sample Projects:

- **Building 90 Facilities Upgrade** – Led process engineering for \$20 million expansion of vaccine production facility: USP PW & WFI systems, waste treatment (pH & solids), lab water system, clean steam, lyophilizer, and support utilities.
- **Building 86 Waste System** – Designed duplex pH neutralization system, led HAZOP review, prepared tender pkg, evaluated bids, acted as owner's rep, contract admin, reviewed shops, supervised installation/testing/commissioning.

WORK EXPERIENCE (cont'd)

Control Systems Consultant (2007)

INVENTURE SYSTEMS LTD – Concord, Ontario

Inventure Systems provides turnkey engineering solutions for the concrete industry, from upgrades to complete batch plants.

Provided control system engineering and process monitoring support for SCADA monitoring of ready-mix concrete plants.

Sample Project:

- **Ready-Mix Plant** – Developed detailed design for SCADA monitoring of fan, motor, vibration, and bin levels.

Control Systems Specialist (2006)

INTLVAC – Georgetown, Ontario

Intlvac designs and manufactures custom high vacuum systems for ion-beam etch, vapour deposition, and thin film applications

Designed, implemented, and commissioned control systems for systems used in semiconductor, optics, and defence industries. Provided technical support for installed systems, developed training materials, and wrote user manuals

Sample Projects:

- **Ion Beam Mill** – Developed control sequencing for ion beam mill employing central vacuum chamber and sample introduction chamber with motorized valves and robotics. Automated multiple PLC and microcontroller-based modular control systems for vacuum pumps, liquid helium cooling, cryostat, 10kV power supplies, and plasma control.
- **York University: Space Simulation Chamber** – Implemented microcontroller-based control of vacuum pumps, cryopumps, and polycold refrigeration systems to simulate space for Mars Rover project. Full LabVIEW front end.

Technical Coordinator – R&D (2005)

RWDI, Consulting Engineers & Scientists – Guelph, Ontario

RWDI provides a wide range of design services including wind engineering, air quality, wind/snow loading, and vibration analysis.

Assisted with engineering studies of air movement, loading, vibration, and wind tunnel simulations. Developed calculation tools using C/C++, C#, .NET, VisualBasic, Web Services, SQL, Excel Macros, FORTRAN, and dbase for statistical models.

Sample Projects:

- **1000-Year Wind Calcs** - Automated tool to correlate weather data and statistical models to estimate window loads.
- **Burj Khalifa Cladding Study** - Created statistical models using Weibull & Gamma distributions to estimate wind loads.

Web Designer / Programmer (1998 - 2015)

WEB MASTERING SERVICES – Guelph, Ontario

WMS provided consulting services for online transaction processing, user portals and record storage for the insurance industry. Other services also included web development, online identity advice, and database administration services using wide range of technologies.

IT Help Consultant, Computing & Communications Services (1998 - 2005)

UNIVERSITY OF GUELPH – Guelph, Ontario

CCS is the UofG's central IT department which supports over a 100 products & services for the campus's 40,000+ user accounts.

Provided 1st and 2nd level support (both on-site and call centre) for staff, faculty, and students. Team-lead for drafting support policies, maintaining documentation, and web development. Developed and taught training seminars for staff, faculty and students. 20-30 hours per week while completing part-time engineering degree at University of Guelph.

Graham's Marine Electrical Solutions (1994 - 1998)

GRAHAM'S MARINE ELECTRICAL SOLUTIONS – Penetanguishine, Ontario

Part-time and summer business I started when I was 16 years old installing/upgrading electrical systems in boats 20 to 100 ft.

EDUCATION

B.Sc. (Engineering) - Honours (2004)

University of Guelph, Guelph, Ontario, Canada

Major: Engineering Systems & Computing

Minor: Computer Science

Certificate in Project Management (2010)

University of Waterloo, Waterloo, Ontario, Canada

COMMUNITY INVOLVEMENT

Hart House Orchestra, Clarinet (2019-present), **Hart House Symphonic Band**, Clarinet & Bass Clarinet (2020-present)

Rose Orchestra, Clarinet (2020-present)

Guelph Little Theatre, played clarinet in pit orchestra for production of Gilbert & Sullivan's: *The Gondoliers* (2017)

Toronto Concert Band, Contrabass Clarinet (2015-2016), **Mississauga Pops Concert Band**, Clarinet (2015-2018)

MS Bike Ride for Multiple Sclerosis, Rider (2010 – present), Team Captain (2013 – 2014), Tour Leader (2015 – present)