

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 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 Waterworks Association, Water Environment Federation, and other industry groups to author numerous articles on SCADA best practices, led the annual ISA Water/Wastewater and Automatic Controls Symposium, and contributed to other industry events.

As a project manager and technical leader, Graham works at the forefront of the Automation, Controls, and Instrumentation community. He is frequently sought to author opinion articles for industry publications, including InTech, Chemical Engineering Progress, and Control Engineering, and to speak at conferences and universities. In addition to having exceptional skills in technical writing and presentation delivery, Graham excels at user needs assessment and project management. Graham has a solid background in system integration, construction management, control systems engineering, electrical design, software development, and user interface design. At present, Graham is responsible for the long-term planning, design, construction/implementation, and commissioning of the automated control systems for the City of Guelph Waterworks. Before he joined the city, he worked as a consulting engineer where he led his company's alarm management services for SCADA, DCS, and PLC systems. Prior to working in the municipal sector, Graham did project management, design, and commissioning/validation work in the pharmaceutical/biotech industries.

SPECIALTIES

project management | project planning | budgeting/scheduling | contract administration | assessment and status reports
proposal writing | needs assessment | meeting facilitation | presentations | technical reports | field supervision
tendering | coordination | contract documents preparation/review | experience with union and non-union environments

automated control system design | network design | instrumentation | electrical design | SCADA/HMI systems
safety instrumented systems | PLC/RTU, DCS and HMI programming | cyber security design and best practices
alarm management | water and wastewater treatment systems | specification writing | tendering | CCDC2 | earned value
process design | engineering drawings | startup/commissioning | on-site troubleshooting | front-end and detailed design

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 2014

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

INDUSTRY RECOGNITIONS

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

The Engineering Mid-Career Award recognizes an alumnus who has graduated from the University of Guelph in the last 10 to 25 years. This award is presented to an individual who has earned respect within the profession and in the broader community, one who has already attained significant achievement and gives promise to future contributions.

Volunteer Leader of the Year (2013), ISA: 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 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," May/June 2011

1st Prize for Best Paper (2011), 7th 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. (2014) "Workforce Development: It's a Team Effort." ISA InTech magazine. Aug/Sept 2014. pp. 46.
- Nasby, G. (2013) "Trouble Justifying Automation Investments? Talk to Operations." ISA InTech magazine. Jul/Aug 2013. pp. 82.
- Nasby, G. (2012) "Using Process Flow Sheets as Communication Tools." Chemical Engineering Progress (AIChE). Oct. 2012. pp. 36-44.
- Nasby, G. (2011) "Control System Failure Survival Strategies," Control Engineering magazine, Nov 2011, pp. P14-P16.

Technical Reports / Standards

- ANSI/ISA-18.2-2016 & IEC-62682 "Alarm Management for the Process Industries." ISA & International Electrotechnical Commission
- ANSI/ISA-101.1-2015 "Human Machine Interfaces." ISA
- ISA-TR18.2.4-2012 "Enhanced and Advanced Alarm Methods." ISA

Full list of publications available upon request.

PROFESSIONAL CONTRIBUTIONS

Committees:

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

Leading a committee of 140 engineers to develop a new global SCADA systems standard. Expected publication date: 2022.

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 upcoming technical reports.

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

*Responsible for maintenance of ISA-18.2 alarm management standard, overseeing adoption of ISA-18.2 to the IEC-62682 standard
Currently co-author of the 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.
Named Canadian expert on "alarm management" for IEC Technical Committee 65A Working Group 15.*

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.

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

Act as liaison between WEF and ISA. Facilitate ISA-WEF collaboration at the WEF WEFTEC and ISA WWAC conferences.

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

Formerly held positions:

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 technical report that was published in Feb 2017.

Director, ISA Water/Wastewater Technical Division (2013-Dec 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 (2013-2014), VP & President-elect (2010-2011)

*Recruiting, motivating and coordinating volunteers for local events (tours, speakers, annual Expo trade show, golf tournament, etc.)
Hosted the 2014 ISA District Leadership conference for Eastern Canada held in Niagara Falls, Ontario (Apr 26-27, 2014)*

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

Revamped a struggling money-losing conference from only 31 attendees in 2011, to 170 in 2012, and then 250 in 2013.

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 (Oct. 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 35 water facilities.

Sessional Instructor, Evenings (2017 – present)

McMASTER UNIVERSITY, Faculty of Engineering (Main Campus) – Hamilton, Ontario, Canada

McMaster is publicly-funded research university with 28,000 undergraduate and 4000 graduate students spread across four campuses. As part of their degree completion program (DCP), I teach a night course on legal and regulatory issues for engineers.

Guest Instructor (2017 – present)

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

With campuses in Peterborough, Lindsay, Coburg, and Halliburton, Fleming College has 8,500 full time and 10,000 part time students. Teaching as a guest instructor for their Advanced Water Systems Operations and Management (AWSOM) program.

Instrumentation & Controls Lead (2013 – Sept. 2015)

System Integrator (2010 – 2012)

ERAMOSIA ENGINEERING INC. – Guelph, Ontario, Canada

Eramosa is a consulting engineering firm that provides system integration, electrical engineering, and SCADA master planning services for the municipal water/wastewater sector. Medium-sized firm with 100 employees, offices in Guelph ON, Detroit MI, and Calgary AB.

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 that provides process engineering, commissioning, and validation services for the pharmaceutical industry. Their speciality is pharmaceutical water treatment, pure steam, and waste inactivation/treatment systems.

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 - 2010)

WEB MASTERING SERVICES – Guelph, Ontario

WMS provided consulting services for online transaction processing, user portals and data 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. Was 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

Guelph Little Theatre, played clarinet in pit orchestra for musicals (2017-present)

Mississauga Pops Concert Band, Clarinet Player (2015-present)

Toronto Concert Band, Contrabass Clarinet Player (2015-2016)

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