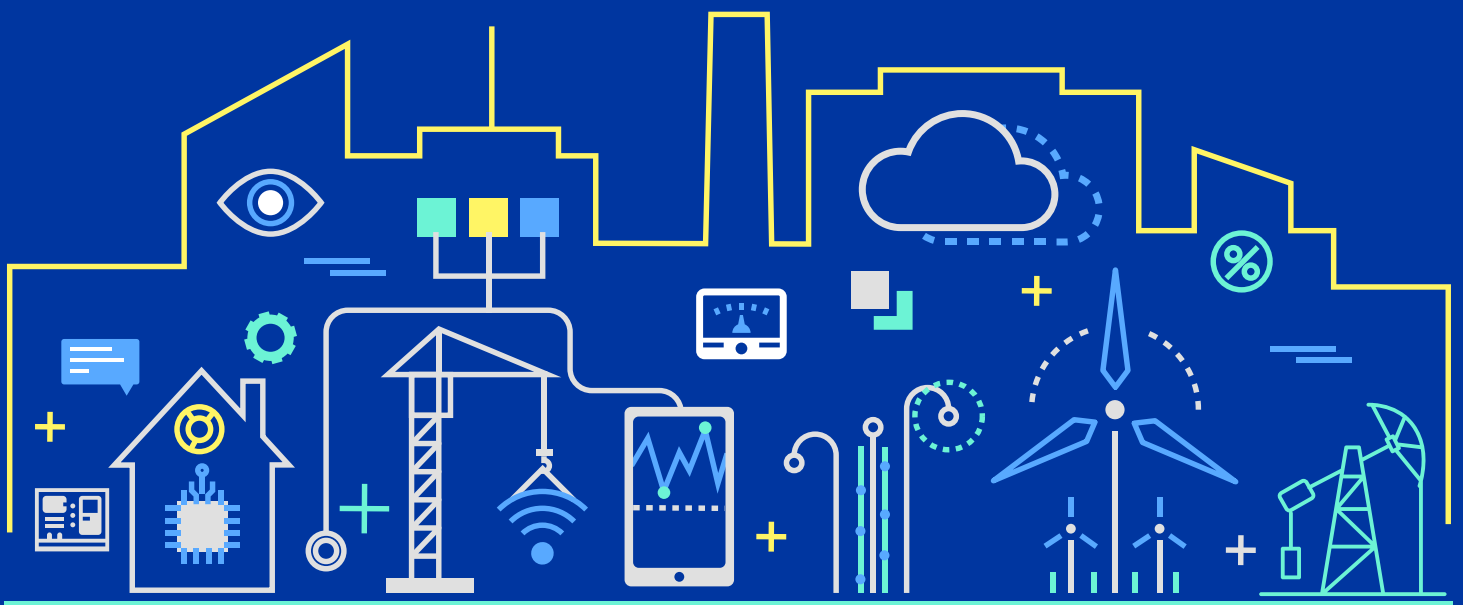


Advances in Process Automation and Control 2019

18–20 November 2019,
Manchester, UK

Conference programme



Conference sponsors

ABB



Event partner

Honeywell

Introduction



On behalf of the technical committee, I would like to welcome you to *Advances in Process Automation and Control 2019*.

Our emphasis for this year's conference is new technologies, new solutions to old problems, and the new challenges faced by the process industries. Presenters and attendees will gain a clearer insight into best practices and emerging technologies in process automation, particularly emerging areas of IoT, machine learning, security, big data analytics and smart manufacturing.

The last 40 years have seen continual growth in the use of automation and control technologies in process manufacturing. These changes have enabled higher process performance, reduced operating risk, and improved staff productivity but the pace of change continues to accelerate and is increasingly daunting. We hope that this conference will help you to explore these changes and their implications and to get the inside track on the explosion of data, technology and innovation that's coming our way.

Attendees at this conference will have a unique chance to share and develop their knowledge of process automation and control methods, make new contacts, meet like-minded professionals and foster new collaborations. I encourage you to make the most of your time here and I look forward to speaking to you.

A handwritten signature in black ink that reads "C. Hamlin". The signature is written in a cursive style with a long, sweeping underline.

Chris Hamlin
Chair of technical committee

Technical committee members

Chris Hamlin, Chair (Founder and Lead Advisor, HancockHamlin)
Russell Baker (EPC Account Manager, Honeywell Control Systems)
Chris Catterall (Senior Advanced Process Control Consultant, Phillips 66)
Nirav Chokshi (Control Systems Engineer, Fluor)
Nicholas Harbud (Facilities Planning Specialist, Saudi Aramco)
Peter Karran (Director of Operation, Practical Service Improvement)
Barry Lennox (Professor, School of Electrical Engineering, Manchester University)
Doug Nicholson (Consultant, Spiro Control)
Andrew Ogden-Swift (Director of Technology Strategy, Honeywell Control Systems)
Zaid Rawi (Engineering Director, BP International)
Maurice Wilkins (Executive Advisor, Yokogawa)

Plenary speakers



In recent years, there has been much discussion of machine learning and AI as new technologies improve process manufacturing performance.

Brian Parsonnet, CTO and Founder, Seeq, will address the challenges and some approaches for overcoming them with the aim of helping attendees understand critical success factors.



Whilst there is much guidance available on cyber security, there is no established relevant good practice in the UK. The Health and Safety Executive has recently released updated guidance that seeks to provide a basis for regulation of cyber security in the process industries. **Nic Butcher, HM Specialist Inspector (Electrical, Control & Cyber Security), HSE**, will discuss the basis for this guidance, and how it will be used for regulation of cyber security risk management.



A founder member of IChemE's Process Management and Control SIG, **Professor Jonathan Love** thinks of himself as an industrialist in academic's clothing. He has committed the last 25 years of his career to delivering an MSc in Process Automation and is the author of the *Process Automation Handbook*. Here he will share some of the lessons he has learned and talk about practising what he preaches.

Monday 18 November 2019

09:00 –10:00	Registration
10:00 –11:25	Workshop: A hands-on demonstration of process optimisation using machine learning techniques - Matthew McEwan, Perceptive Engineering
11:25 –11:45	Break
11:45 –13:15	Workshop: A lecture and exercises on control schemes and strategies – the process of determination - Professor Jonathan Love, Imperial College London
13:15 –14:00	Lunch, exhibition and poster presentations
14:00 –14:15	Opening address <i>Chris Hamlin, Chair of Organising Committee</i>
14:15 –15:00	Plenary speaker <i>Practising What I Preach</i> Professor Jonathan Love, Imperial College London
15:00 –16:10	United Kingdom Automatic Control Council (UKACC) presentations
16:25 –17:30	Poster viewing and drinks reception, sponsored by BP

Tuesday 19 November 2019

08:30 –09:00	Registration
09:00 –09:45	Plenary speaker <i>Automation: extinction event or evolutionary force for plant operators?</i> - Maurice Wilkins, Executive Advisor, Yokogawa
Operator 4.0 - emerging technologies	
09:50 –10:15	<i>Connected, integrated, digital field operator - making a step change in reducing human error</i> - Karl Watson, Global Process Safety Product Manager, ABB Energy Industries
10:15 –10:40	<i>Closed-loop integration of planning, scheduling, and explicit control for continuous manufacturing</i> - Vasileios Charitopoulos, Research Associate, Energy Policy Research Group, University of Cambridge
10:40 –11:05	Refreshments, exhibiton and poster presentations
11:05 –11:35	<i>Advanced process control of an ethylamine process</i> - Patrick Thorpe, Managing Director, Spiro Control Ltd
11:35 –12:00	<i>Use of modern analytics tools to evaluate variation reduction</i> - Andrew Ogden-Swift, Director, Ogden-Swift Consulting Ltd
12:00 –12:25	<i>Digital transformation - an end-user perspective</i> - Maurice Wilkins, Executive Advisor, Yokogawa
12:25 –12:50	<i>Lessons learnt in the connected plant and digital twins arena - the architecture</i> - Martin Bragg, Chief Technology Officer, Honeywell Ltd
12:50 –13:50	Lunch, exhibition and poster presentations
13:50 –14:40	Plenary: Cyber security - the regulator's perspective - Nic Butcher, HM Specialist Inspector (Electrical, Control & Cyber Security), Health & Safety Executive
Cyber security and new architectures	
14:40 –15:05	<i>Industrial cyber security enhancements</i> - Cevn Vibert, Global Director ICS Industrial Cyber Physical Security, Vibert Solutions
15:05 –15:30	<i>Resilient industrial networks – preparing for tomorrow's connectivity</i> - Dr Naz Khaleque, Industrial Cybersecurity, Honeywell Industrial Cyber Security

15:30–15:55	Refreshments, exhibition and poster presentations
16:00 –16:25	<i>Intelligent device integration technology including cyber security for the new industrial world</i> - Nick Garrett, Project Manager, FieldComm Group
16:25 –16:50	<i>The ICS security journey</i> - Nicky Jones, Security Lead and Director, NSRJ Consulting Ltd
16:50 –17:15	<i>OT cyber security: the importance of a scaled approach</i> - Thomas Olsen, Founder and Managing Director, Lagoni
From 19:00	Conference dinner served at 19:30, Blackhouse Grill on New York Street, New York Street Manchester M14 6BD (ticket only)

Wednesday 20 November 2019

08:30 –09:00	Registration
09:00 –09:50	Plenary speaker <i>Addressing practical challenges of process analytics</i> - Brian Parsonnet, CTO and Founder, Seeq
Sustainability	
09:50 –10:15	<i>Resource efficient decision-making tools for industry</i> - Jonathan Cullen, Lecturer, University of Cambridge
10:15 –10:40	<i>Economic model predictive control applied to a micro-grid</i> - Patrick Thorpe & Andrew McGuire, Spiro Control Ltd
10:40 –11:05	<i>Improving resource efficiency of industrial processes using digital twin</i> - Vicente Rios, Senior Consultant and Group Leader, Process Simulation Europe, Emerson Automation Solutions
11:10 –11:35	Refreshments, exhibiton and poster presentations
Business integration and the complete digital twin	
11:35 –12:00	<i>The whole plant digital twin: what can semantic technologies contribute?</i> - David Cameron, Centre Coordinator, SIRIUS Centre for Scalable Data Access, University of Oslo
12:00 –12:25	<i>Closing the gap between planning and control: a multi-scale MPC cascade approach</i> - Andrew Trenchard, Engineering Fellow, Honeywell Controls Ltd
12:25 –12:50	<i>A block-chain modelling approach for the digital food value chain</i> - Dr Evgenia Mechleri, University of Surrey
12:50 –13:50	Lunch, exhibition and poster presentations (includes Process Management & Control SIG AGM at 13:15)
13:50 –14:20	Honeywell presentation
14:20 –14:45	<i>A practical application of a digital twin - integrating simulation into daily operations to minimize lost profit</i> - Andrew McIntee, Marketing Manager, KBC (A Yokogawa Company)
14:45 –15:10	<i>Advanced process control of a pharmaceutical granulation process - a digital design approach</i> - Mihai Rascu, Senior Engineer, Perceptive Engineering Ltd
15:10 –15:35	<i>Intelligent digital operations - incorporating deep process knowledge within plant automation systems</i> - Chris Leingang, Business Development Manager, Siemens Plc
15:35 –16:00	<i>Advanced process control in society</i> - Howard Boder, Consultant Process Control, Newland Control and Brian Neve, Director, Spiro Control Limited
16:00–16:30	Closing session

Programme is subject to change.

Poster Presentations

Digital design and operation of continuous crystallization processes via mechanistic modelling

Mihai Rascu, Senior Engineer, Perceptive Engineering Ltd, UK

Optimisation of the gas distribution of a wastewater treatment plant: a mixed integer linear programming approach

Harry Laing, PhD Researcher, Newcastle University, UK

Detecting valve stiction using machine learning algorithms trained on features extracted from time series

Harrison O'Neill, PhD Student, University of Chester, UK

The state of industrial cyber security

Ben Dickinson, Global Program Manager for Cyber Security, Energy Industries, ABB, UK

How the digital transformation can support the chemicals industry

Will Leonard, UK Digital Lead, Energy Industries, ABB, UK

LNG monetizing improvement based on real timed process efficiency and automations

Nazatul Sheema Che Din, Petronas, Malaysia

Resourceful investment decisions: providing a richer understanding of operational resource efficiency in process industries

Ana Gonzalez Hernandez, Resource Efficiency Consultant, Emerson Process Management, UK

Application of an automated process model for online equipment performance monitoring in LNG complex

Timothy Nex Ak Betin, Petronas, Malaysia

Multi-objective design of distributed energy systems under uncertainty

Ishanki De Mel, University of Surrey, UK

Poster programme subject to change



Innovative, proven solutions to support your digital needs

ABB is embracing digitalisation in its products, services and the way it operates. Based on decades of domain expertise we have developed a wealth of knowledge around specific assets and operations. Working with specialist partners we are extending this to the complete digital twin. Our digital expertise is based on over fifty years in oil, gas and chemicals, a team of 5,000 experts and the implementation of over 3,000 projects worldwide. For further information please visit: new.abb.com/oil-and-gas/digital

SUSTAIN PEAK PERFORMANCE.

Benchmark your actual process and asset performance data against your expected performance with Honeywell Forge for Industrial, for better decisions that impact reliability, safety and profitability.

For more information,
please visit: www.honeywellprocess.com/iiot



THE FUTURE IS WHAT WE MAKE IT |

Honeywell

Event supporters

The International Society of Automation (ISA)



Founded in 1945, the International Society of Automation is a leading, global, non-profit organization that is setting the standard for automation by helping over 30,000 worldwide members and other professionals solve difficult technical problems, while enhancing their leadership and personal career capabilities.

The Institute of Measurement and Control



Founded in 1944 and incorporated by Royal Charter in 1975, The Institute of Measurement and Control is committed to promoting the professional excellence and standing of engineers and technologists at all levels in the automation, instrumentation, control and related industries. Our aims are to serve the public benefit by advancing the science and practice of measurement and control technologies and their various applications, to foster the exchange of views and the communication of knowledge and ideas in these activities, and to promote the professional development and qualification our members. The Institute is therefore both a learned society and a professional qualifying body occupying a niche in the automation-focussed industries.

Institution of Engineering and Technology Control & Automation Technical Network



The Institution of Engineering and Technology aims to inspire, inform and influence the global engineering community to engineer a better world. The Control & Automation Network strives to be a central repository for all control and automation needs throughout the UK and the rest of the world. It was established to represent all those with an active interest in automation and control and will be relevant to those involved with the design, implementation, construction, development, analysis and understanding of control systems.

Process and Control



Process & Control is the leading information source for engineers who have a direct influence on the specification and procurement of process and control products, equipment, systems and services. The editorial content includes a mix of technology features, case studies, new product information and general industry news, and reports on developments in process equipment and control and instrumentation technologies.



“ PROVIDING FULLY INTEGRATED, MULTIDISCIPLINARY SUPPORT THROUGH THE LIFE CYCLE OF AN ASSET – DRIVING EFFICIENCIES, IMPROVING PLANT PERFORMANCE AND REDUCING COSTS. ”

Bilfinger UK is a market leader in automation consultancy, design, development, installation and commissioning. With extensive experience in highly regulated environments combined with a strong focus on compliance and safety, we develop solutions that add value for our customers.

Our highly skilled engineers can develop and integrate solutions tailored to meet specific project needs and our independent status means that we can recommend the best technology to deliver customers’ unique requirements, delivering optimum performance of assets.

With a strong pedigree in automation and a comprehensive knowledge of industry processes, regulations and standards, we offer solutions that improve operational environments and delivery efficiency improvements.

Our experienced in-house engineers are able to design, develop and integrate fit-for-purpose automation solutions on projects of all sizes. We can integrate hardware and software solutions covering PLC, SCADA, Telemetry, MES, DCS, and database technologies.

We also have the capability to develop bespoke software applications in house to meet clients’ bespoke requirements.

Our breadth of experience of automation technologies ranges from legacy systems to the latest products and innovations. We are able to integrate new or existing infrastructure and advise on configuration for optimum performance.

“ EVERYWHERE WE WORK, WE ENSURE THAT OUR CLIENTS CAN CONCENTRATE ON WHAT THEY DO BEST: THEIR CORE BUSINESS. ”



OUR DIGITALISATION & AUTOMATION CAPABILITIES:

- Asset Support
- Bilfinger Connected Asset Performance - Predictive Analytics
- Industrial Tube - Best Practice Capture
- Bilfinger Mobile Solutions - Work Order
- Management
- PID Graph & Digital Twin
- Industrial 360 - Interactive Photogrammetry
- Remote Worker
- Cybersecurity
- FEED Studies & Consultancy
- SCADA & PLC systems
- Industrial Networking
- Functional Safety Systems
- Industrial IT Solutions
- RTU & Telemetry Systems
- Manufacturing Execution Systems
- Plant Historians & Information Systems
- Material Tracking Systems
- Batch & Recipe Management Systems

DELIVERED BENEFITS:

- ✓ 7-15% Enhanced OEE
- ✓ 10-30% Reduced maintenance costs
- ✓ 15% Increased work productivity
- ✓ Up to 25% reduction of unplanned downtime

Visit our website www.uk.bilfinger.com or contact us at info.b-uk@bilfinger.com

Conference Partner

Honeywell

Honeywell is a Fortune 100 technology company that delivers industry specific solutions that include aerospace products and services; control technologies for buildings and industry; and performance materials globally. Our technologies help everything from aircraft, buildings, manufacturing plants, supply chains, and workers become more connected to make our world smarter, safer, and more sustainable.

Visit www.honeywell.com

Conference Sponsors



ABB is writing the future of safe and smart operations for industry, with ABB Ability™ delivering integrated and secure digital solutions that deliver value for customers with increasing autonomy, sustainability and optimized performance. ABB Energy Industries brings deep domain knowledge and technical expertise in energy and water, oil and gas, specialty chemicals and primary pharmaceutical industries. Building on our heritage, a spirit of collaboration and innovation inspires our digital leadership as we engineer and provide products, services and solutions that support our partners for success, both today and tomorrow as we look ahead to a new energy future.



BP is a global energy company with wide reach across the world's energy system. The energy we produce serves to power economic growth and lift people out of poverty. In the future, the way heat, light and mobility are delivered will change. We aim to anchor our business in these changing patterns of demand, rather than in the quest for supply. We have a real contribution to make to the world's ambition of a low carbon future. We have operations in Europe, North and South America, Australasia, Asia and Africa, and employ around 74,000 people.

Meet demand for energy or reduce its impact? Technology can help us do both.



Bilfinger UK is a leading industrial engineering services provider delivering intelligent solutions and asset support to the process industry. We provide fully integrated, multidisciplinary support through the life cycle of an asset, driving efficiencies, improving plant performance and reducing maintenance costs.

We are a market leader in automation consultancy, design, development, installation and commissioning. With extensive experience in highly regulated environments combined with a strong focus on compliance and safety, we develop solutions that add value for our customers.

Our highly skilled engineers can develop and integrate solutions tailored to meet specific project needs and our independent status means that we can recommend the best technology to deliver customers' unique requirements, delivering optimum performance of assets.

With a strong pedigree in automation and a comprehensive knowledge of industry processes, regulations and standards, we offer solutions that improve operational environments and delivery efficiency improvements

Exhibitors



The Institution of Chemical Engineers (IChemE) advances chemical engineering's contribution worldwide for the benefit of society. We support the development of chemical engineering professionals and provide connections to a powerful network of over 37,000 members in more than 100 countries.

Exhibitors



IT Vizion is a digitalisation and IT services provider. We combine domain knowledge in industry with our IT expertise to help clients maximise the return on their operational data and IT investments.

We endeavour to deliver pragmatic solutions and digital transformation that deliver real business value. We achieve this by:

- partnering with proven technology vendors and progressive customers
- building a robust data infrastructure
- automating data processing
- transforming raw data sets into actionable information with analytics.
- integrating people, processes and technology.

Hit the ground running with IT Vizion, your data is our science.



Yokogawa is a leading provider of industrial automation and test and measurement solutions. Combining superior technology with engineering services, project management, and maintenance, Yokogawa delivers field proven operational efficiency, safety, quality, and reliability.

Bring IChemE trainers to your organisation

“ The course couldn't have been run any better in my opinion. ”

In-company course attendee

The Institution of Chemical Engineers' in-company training service can bring our training expertise directly to your organisation.

We offer a range of training courses in process safety, process operations, personal development, commercial and project management and sustainability which can be delivered to your organisation at a time and place to suit you.

Any course from our catalogue can be delivered to your team in-house. Alternatively, you can request a customised course which meets your requirements. Our expert course leaders will take the time to understand your training requirements so that we can provide a solution that fulfils your objectives.

If you have a team of people to train, an IChemE in-company course is ideal. Our unrivalled industry knowledge makes us the clear choice to help you deliver your training requirements to your team.

www.icheme.org/incompany

IChemE ADVANCING
CHEMICAL
ENGINEERING
WORLDWIDE

Global headquarters

UK – Rugby

t: +44 (0)1788 578214

e: info@icheme.org

Australia

t: +61 (0)3 9642 4494

e: austmembers@icheme.org

Malaysia

t: +603 2283 1381

e: malaysianmembers@icheme.org

New Zealand

t: +64 (4)473 4398

e: nzmembers@icheme.org

Singapore

t: +65 6471 5043

e: singaporemembers@icheme.org

UK – London

t: +44 (0)20 7927 8200

e: info@icheme.org



www.icheme.org



IChemE is a registered charity in England and Wales, and a charity registered in Scotland (SC 039661)