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EXHIBITION & CONFERENCE

2018

Runcorn, UK February 28 & March 1 hazardexonthenet.net

PROTECTING PLANT, PROCESS & PERSONNEL

CONFERENCE NOTES

OPENING TIMES

Wednesday 28 February 2018
9.00 - 16.20

Thursday 1 March 2018
9.00 - 15.40

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Hazardex Conference & Exhibition 2018

The essential business forum for everyone involved in the safe and efficient operation of hazardous area plant and equipment

Editorial Notes

These notes contain details of the papers presented at the Hazardex 2018 Conference, held at the Holiday Inn Hotel, Runcorn, Cheshire, UK on February 28 & March 1, 2018.

Each author has supplied the organisers with a biographical profile and a summary of the paper. Audio-visual material used to support the presentation is available on the USB stick in the Delegate Pack.

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Welcome to Hazardex 2018!

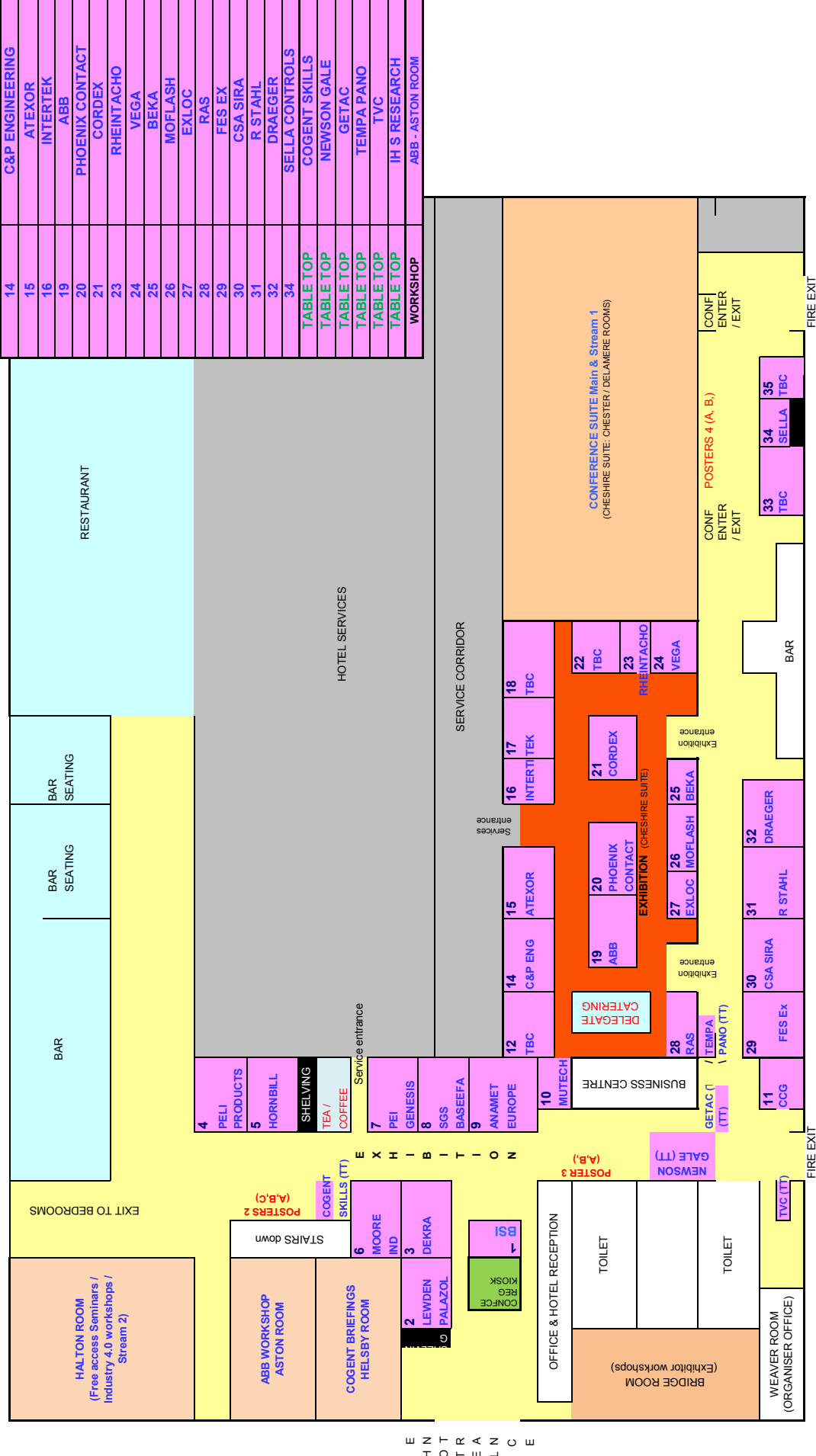
To make your participation at Hazardex as easy as possible we have compiled the following Information Sheet, which should answer any questions you may have. For any further information, speak to the organisers at the Conference Reception Desk. Please enjoy the exhibition and we wish you a successful and useful conference.

- Check-In:** You will be able to check into your room any time from 2.00pm on the day of arrival. A swipe of your credit card will be taken upon checking-in, so that any extras can be charged to your room and settled upon departure.
- Check Out:** All guests must vacate their hotel rooms during the morning of the 1st March (or day of departure) - by 11am at the very latest. Any extra costs must be settled with your hotel upon departure. Please leave sufficient time to check out as it may be a very busy time and could reduce your time in conference.
- Exhibitor Contact Details:** These can be found at the back of this Conference Pack.
- Gala Awards Dinner:** The dress code for the Gala Dinner is business suits, ties optional. The drinks reception will be held in the hotel bar. Dinner will commence at 8pm in the Cheshire Suite where the conference is being staged during the day.
- Event venue:** The Holiday Inn Hotel, Wood Lane, Beechwood, Runcorn, WA7 3HA, UK
www.holidayinn.com/runcorn
- Product & Services** Please take time to view the Exhibition during your lunch and refreshment breaks. The companies represented are all leading suppliers of equipment and services for hazardous areas and should be able to assist you with any query you may have.
- Assessment Forms:** Please would all Delegates/Speakers/Event Partners/Sponsors complete an Assessment Form, found at the back of this Conference Pack, and hand it to the organisers at the registration desk upon departure. This will enable us to improve future events and ensure they fully meet your needs.
- Taxis:** These can be ordered from the Main Reception of the hotel.

Floorplan and exhibitor list

Hazardex 2018 Conference & Exhibition – Holiday Inn, Runcorn, Cheshire – February 28 & March 1, 2018

HAZARDEX 2018 [28th February & 1st March]



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STAND #	EXHIBITOR
1	BRITISH STANDARDS INST
2	LEWDEN PALAZOLLI
3	DEKRA INSIGHT
4	PELI PRODUCTS
5	HORNBILL ENGINEERING
6	MOORE INDUSTRIES
7	PEI GENESIS
8	SGS BASEEFA
9	ANAMET EUROPE
10	MUTECH
11	CCG
14	C&P ENGINEERING
15	ATEXOR
16	INTERTEK
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WORKSHOP	ABB - ASTON ROOM



HAZARDEX 2018 – PROTECTING PLANT, PROCESS & PERSONNEL

Running order subject to change.
Check www.hazardexonthenet.net for the latest updates

HAZARDEX CONFERENCE 2018 – DAY 1 – 8.00 – 9.20: REGISTRATION & COFFEE

Day 1 Morning – Cybersecurity, IIOT & Industry 4.0

Main conference room (Access for delegates & exhibitors only)

Chairman: Lee Allford, Energy Institute

9.20 – 9.30: Chairman's introduction

9.30 – 10.10: **Sarabjit Purewal - Acting Head of Operations, HSE, & Tony B - ICS Tech Lead, NCSC**
Cybersecurity: Is the UK prepared to address the risks?

10.15 – 10.55: **Ian Curtis - Process Safety Systems Consultant, Siemens**
Digitalisation changes everything

10.55 – 11.30 Coffee & exhibition viewing

11.30 – 12.10: **Dr Alexander Horch - Head of Development, HIMA**
Safety & Security: The last line of defence is restored

12.15 – 12.55: **Thomas P. Ventulett - CEO, Aegex Technologies**
Toward an IoT Platform for Hazardous Locations: Examining the collaboration of humans and edge technologies in disaster scenarios for insight into Industrial IoT for extreme operations

13.00 – 14.00: Lunch

Day 1 Afternoon - Stream 1 - Incident & Risk Management

Main conference room (Access for delegates & exhibitors only)

Chairman: Lee Allford, Energy Institute

14.00 – 14.40: **Zsuzsanna Gyenes – Deputy Director, IChemE Safety Centre (ISC).**
Lessons learned from major accidents in different industrial sectors

14.45 – 15.25: **Roger Stokes - Principal Engineer, BakerRisk**
When the lights go out

15.30 – 16.10: **Carolyn Nicholls - Consultant, RAS Ltd**
Risk tolerability targets; misconceived, misunderstood and misapplied

Day 1 Morning/Afternoon - Stream 2 – Safety Culture

Seminar Room (Access open to all registered attendees)

Chairman: Ron Sinclair, Technical Manager, SGS Baseefa

11.30 – 12.10 **Dr Kevin Fitzgerald – Risk Management Dept. Manager, Lloyd's Register Energy**
Safety Culture, Climate and Performance Improvement

12.15 – 12.55: **Jamie Walker - Safety, Projects & Associate Membership Director, UKPIA**
Mental health awareness in a safety critical environment

Day 1 Afternoon - Stream 2 – IIoT & Industry 4.0

Seminar Room (Access open to all registered attendees)

Chairman: Ron Sinclair, Technical Manager, SGS Baseefa

14.00 – 14.40: **Matt Jakuc - Cybersecurity Technical Lead, CSA Group**
The Role of Third-Party Testing in Securing Industrial Internet of Things (IIoT) compliance

14.45 – 15.25: **Gido Van Tienhoven - CEO, Ex-Machinery**
IIoT 4.0 and LoRa for maintenance purposes in hazardous areas

15.30 – 16.10: **Stefan Hack - Business Development Manager, R.STAHL**
Paperless safety lifecycle at the R.STAHL Plant & Engineering Centre

17.30: Exhibition closes

18.30: Drinks

19.30: Evening event & awards dinner

22.30: After dinner networking



HAZARDEX 2018 – PROTECTING PLANT, PROCESS & PERSONNEL

Running order subject to possible change.
Check www.hazardexonthenet.net for the latest update

HAZARDEX CONFERENCE 2018 - DAY 2 - 8.30 - 9.20: REGISTRATION & COFFEE

Day 2 Morning – Stream 1 – Functional Safety & Cybersecurity

Main conference room (Access for delegates & exhibitors only)

Chairman: Lee Allford, Energy Institute

9.20 – 9.30: Chairman's introduction

9.30 – 10.10: **Nic Butcher - ECI Specialist Inspector, HSE**

Functional Safety Management of Installed SIS

10.15 – 10.55: **Tino Vande Capelle, Consultant, TVC, & Steve Smith, Consultant, ONRIX gcv**

No Safety without Security – No Security without Safety

10.55-11.30: Coffee & exhibition viewing

Day 2 Morning/Afternoon – Stream 1 – Certification & Regulation

Main conference room (Access for delegates & exhibitors only)

Chairman: Lee Allford, Energy Institute

11.30 – 12.10: **Hassan El Sayed - Functional Safety Business Manager, CSA Group**

Certification of Robotics in an Ex environment- ATEX and Functional Safety Requirements

12.15 – 12.55: **Frank Angear – General Manager, British Safety Industry Federation (BSIF)**

Recent changes in regulations governing PPE

Day 2 Morning - Stream 2 - Functional Safety & Safety Systems

Seminar Room (Access open to all registered attendees)

Chairman: Ron Sinclair, Technical Manager, SGS Baseefa

9.30 – 10.10: **Chris Parr - Technical Authority for Functional Safety, Sella Controls**

Cybersecurity - What should Safety Instrumented System Integrators be doing?

10.15 – 10.55: **Rob Turner - Advanced Solutions Consultant, Yokogawa**

When Safety meets Security, Combining the Best of Both Worlds

10.55-11.30: Coffee & exhibition viewing

Day 1 Morning/Afternoon - Stream 2 – Practical challenges & solutions

Seminar Room (Access open to all registered attendees)

Chairman: Ron Sinclair, Technical Manager, SGS Baseefa

11.30 – 12.10: **Tarmo Rintala - Technology Manager, Atexor Oy**

Are luminaires causing hidden risks in Ex Areas because of LEDs?

12.15 – 12.55: **Geof Mood - Technical Director, CCG Cable Terminations Ltd**

Coldflow in cables – some practical advice

13.00 - 14.00: Lunch

Day 2 Afternoon - Stream 1 – Fire risk management

Main conference room (Access for delegates & exhibitors only)

Chairman: Lee Allford, Energy Institute

14.00 – 14.40: **James Daley - Fire Safety Engineering Consultant, RPS Risk Management**

Fire Prevention Plans

14.45 – 15.25: **Tim Jones - Senior Consultant, MMI Engineering**

Fire detector mapping – what metrics should we be using?

15.25 - 15.35: Chairman's closing remarks

Day 2 Afternoon - Stream 2 – Practical challenges & solutions

Seminar Room (Access open to all registered attendees)

Chairman: Ron Sinclair, Technical Manager, SGS Baseefa

14.00 – 14.40: **Mike O'Brien – Managing Director, Newson Gale**

Electrostatic Hazard Awareness for Managers and Engineers

14.45 – 15.25: **Sarra Cheyne – British Standards Institution (BSI)**

Making excellence a habit - How to improve performance, reduce risk and achieve sustainable growth in the area of explosive atmospheres

15.25 - 15.35: Chairman's closing remarks

15.35: Exhibition closes

DAY ONE – 28/2/2018

1. Cybersecurity: Is the UK prepared to address the risks?

Presenters: Sarbjit Purewal - Health and Safety Executive, & Tony B - National Cyber Security Centre

Abstract: This keynote will cover the work that central Government is doing, including setting up to the National Cybersecurity Centre, its remit, what the landscape looks like and what we know about the energy and chemical industry sectors.

The new Network Information Security (NIS) directive will be transposed into UK law in late 2018, which will bring obligations for industries to manage risks to critical services and consequent penalties for non-compliance or loss of service. Although regulatory decisions will lie solely with the Competent Authorities, NCSC plays a leading role in advising industry and will share their approach to providing supporting guidance to the implementation of NIS.

HSE will share the outcomes from the field trials on the application of its operational guide, development of case studies, the strategic approach for regulating cybersecurity from 2018 onwards and the role industry can/is playing in addressing this topic.

The challenges, and risks looking ahead to the UK energy and chemical industries sector will be explored and what government is doing to assist.

Biographies:

Sarbjit Purewal is Acting Head of Operations at the Health & Safety Executive (HSE). He graduated in Electrical Engineering from Imperial College London in 1976, and trained and worked with the Central Electricity Generating Board (CEGB) in engineering design, project and contract management on both conventional and nuclear power stations. He was Engineering Manager at Kennedy and Donkin Consulting Engineers and Divisional Director of Control and Communications Division at Mott MacDonald before joining the HSE in 2000.

Tony B is the Head of Penetration Testing and CNI Capability at the UK National Cyber Security Centre Operations Division. The NCSC was established in October 2016 and is helping to make the UK the safest place to live and do business online. Our speaker is responsible for building NCSC capability to help improve the resilience of UK Critical National Infrastructure.

2. Digitalisation changes everything

Presenter: Ian Curtis - Siemens

Abstract: A bold statement ... but you don't have to look too far to find examples of where digitalisation has proven to be disruptive.

Now digitalisation is being described as bringing about the next big industrial revolution (or Industry 4.0 as it is sometimes called) promising a quantum leap in terms of benefits to productivity, flexibility, quality... but what of safety? Surely digitalisation offers the scope for improvement in process safety?

The "digitalisation" topic is still somewhat fluid and fast moving and exactly what form it takes differs from one industry to another. Discrete manufacturing topics include collaboration between cyber physical systems; using the internet of things and the internet of services; digitalisation of the whole value chain to achieve increased flexibility and productivity.

This paper seeks to give an overview of digitalisation in a process industry context focusing on the potential benefits for safety.

Biography: Ian Curtis is Process Safety Systems Consultant at Siemens. He has more than 25 years of professional experience working for control, automation and instrumentation vendors. For the last twelve years he has been specifically focused on safety instrumented systems in the process sector. Ian is a TÜV certified Functional Safety Engineer and a Siemens Functional Safety Professional.

3. Safety & Security: The last line of defence is restored

Presenter: Dr Alexander Horch - HIMA

Abstract: The advancing digitalisation has an effect on almost all business processes, especially in the industrial sector. Machines communicate with people and increasingly also amongst themselves. What does this mean for security? Safety controllers have historically focused primarily on emergency shutdown requirements, not from the cyber-security perspective.

For effective cyber security, it is not enough to upgrade an existing product by

adding additional software functionality. Every solution for functional safety must be conceived and developed with cyber security in mind, right from the start. This applies equally to the firmware and the application software. Safety systems, which offer the fewest attack possibilities, represent the most effective defence against cyber attacks. The intelligent use of existing data from the security network now allows operators to improve the efficiency of their systems. Dr Horch will explain how this can be done.

Biography: Since April 2016, Dr Alexander Horch has been Vice President Research, Development & Product Management at HIMA Paul Hildebrandt GmbH. Between 2007 and 2016 he held different management roles in the areas of process control systems and automation of electrical grids, smart grids, manufacturing plant and robotics for ABB Germany and ABB Switzerland, and was latterly Principal Scientist at ABB Corporate Research in Germany for process plant optimisation and plant asset management.

4. Toward an IoT Platform for Hazardous Locations

Presenter: Thomas P. Ventulett - Aegex Technologies

Abstract: As more and more industrial organisations are adopting Internet of Things (IoT) strategies and beginning their digital transformation to Industry 4.0 or Smart Manufacturing, they face challenges in adopting technologies due to regulatory restrictions for highly combustible atmospheres such as exist in some of the world's largest and most critical industries - oil & gas, chemical, pharmaceutical, energy, utilities, food processing, defence and others.

This paper considers the possibilities for an IoT Platform for Hazardous Locations, based on hands-on research conducted by Aegex Technologies, Verizon, Nokia and multiple technology partners that tested various edge technologies with first responders in realistic disaster scenarios during Operation Convergent Response (#OCR2017). The event provided a unique opportunity to test IoT under extreme conditions, such as a staged chemical plant explosion, subway terrorism incident, neighborhood flood, cybersecurity attack, tornado disaster and hostage rescue. The results gave insight into the need for continued collaboration on IoT capabilities that can better manage not only emergency response, but everyday operations in hazardous industries.

Biography: Thomas P. Ventulett is CEO of Aegex Technologies. He has more than 25 years of experience in executive roles in network and communications technology ventures and under his leadership Aegex developed the first Windows 10 industrial tablet universally certified as intrinsically safe for ATEX/IECEx Zone 1 and UL Cl, II, III Div 1 in explosive atmospheres.

5. Lessons learned from major accidents in different industrial sectors

Presenter: Zsuzsanna Gyenes - IChemE Safety Centre

Abstract: Petrochemical and chemical industries store and process a large amount of dangerous substances in complex chemical establishments. For this reason, persistent care to controlling the processes and their related equipment is necessary at these sites to avoid a loss of containment that could lead to a serious accident. In reality, hundreds of chemical accidents are reported in the media around the world every year. Many of them have severe consequences, such as production disruption resulting in significant economic loss, temporary loss of public services, property damage, environmental damage and in the worst circumstances, injury and death. In many cases, lack of knowledge or procedures in place or lack of competence, even complacency, led to the incident.

The paper studies accidents chosen from different industrial sectors and different topics, such as incidents involving fertilisers, contract worker related cases, ageing of establishments or emergency response. These cases seem diverse but in reality, the lessons depicted show similarity and these findings demonstrate that learning from other industries or topics is indeed possible. Furthermore, the study highlights events where the lessons were not learnt even though similar cases had occurred already in the past.

Biography: Dr Zsuzsanna Gyenes joined the IChemE Safety Centre as Deputy Director in September 2017. Earlier positions included a role at the European Commission Joint Research Centre advising member states on Seveso implementation, Head of Section for Nuclear Safety in the Hungarian National Directorate General for Disaster Management, and Seveso Site Inspector in Hungary.

6. When the lights go out

Presenter: Roger Stokes - BakerRisk

Abstract: Processing facilities require a reliable supply of electrical power. The consequences of a sudden power loss ranges from an inconvenience to a major incident with consequences including damage to equipment, failure of emergency systems, loss of containment, fires, explosions and environmental impact. Damage during restart can also be a major issue. The increasing reliance on automated systems for control, emergency shutdown and mitigation means that power supplies and back-up systems must be much more reliable than in the past.

There have been many incidents where loss of external power has been a key factor and there are opportunities to learn from these events when assessing the design criteria and maintenance requirements of supplies and back-up systems. Typical facilities that require a reliable supply of power include offshore platforms, oil refineries, petrochemical, chemical, pharmaceutical, plastics, glass and nuclear industry facilities.

This presentation reviews some examples of incidents that have occurred to encourage operators to reconsider the potential impact of a sudden loss of power at their facility and how they would deal with such an event.

Biography: Roger Stokes joined BakerRisk in 2015 and is Principal Engineer in the Process Safety Group, where his main focus is on incident investigation and insurance risk engineering. After graduating as a chemical engineer he took a position in ICI's Mond Division, ending up as a plant manager. Later, he joined a firm of Loss Adjusters dealing with commercial insurance claims including fires, explosions and machinery breakdown in process manufacturing facilities.

7. Risk tolerability targets; misconceived, misunderstood and misapplied

Presenter: Carolyn Nicholls - RAS Ltd

Abstract: Following on from a quantification (or semi-quantification) of risk, the next step in any assessment is to compare the result to a set of risk tolerability criteria. Three regions of risk are usually defined, an unacceptable region and a broadly acceptable region bordering a region of tolerable risk.

This paper considers the differences between individual risk and societal (group) risk, and how these are often confused and misapplied. Differences between scenario risk and whole site risk, and how these should be considered in different ways depending on the type of risk and the type of study are then discussed. Risk targets are proposed which may be used in LOPA, including a demonstration of how these were developed and how they meet industry and regulatory standards. How these targets can be used and adapted into existing or new facilities, and how they may interact with existing corporate risk criteria and matrices is also considered.

Biography: Carolyn Nicholls is a process safety specialist and a Director of RAS Limited, with more than 10 years' experience of the risk and hazard management industry. She has worked with a number of UK COMAH sites to develop safety reports and provide support in all aspects of risk management. Her particular area of interest is the demonstration of ALARP, an often misunderstood concept.

8. Safety Culture, Climate and Performance Improvement

Presenter: Dr Kevin Fitzgerald - Lloyd's Register

Abstract: The influence that an organisation's culture has on individual behaviour is generally acknowledged and many organisations worldwide have set themselves the goal of improving their safety culture so as to achieve lower incident rates. But what does safety culture really comprise, how do safety culture failings make themselves apparent, and how can we go about changing culture?

This presentation will: 1. Provide a brief introduction to the concept of safety culture and the characteristics of a positive safety culture. 2. Illustrate – through case studies – some consequences of safety culture failings. 3. Indicate how safety climate surveys can be used to help understand safety culture and how the output from these surveys can be used to prioritise issues for improvement. 4. Show some of the typical starting-points for safety culture improvement in organisations.

Biography: Dr Kevin Fitzgerald manages Lloyd's Register's Risk Management Consulting team in the UK, which delivers risk consultancy support to high hazard industry clients. He started his career in the chemicals industry with roles in research, operations and process safety, and he has almost 30 years' experience of the oil & gas, utilities and marine sectors across the EMEA region. His main focus is on helping organisations improve their safety performance and culture.

9. Mental health awareness in a safety critical environment

Presenter: Jamie Walker - UKPIA

Abstract: The stigma around mental health has long been an issue. Fortunately, mental health awareness has recently been heightened as royalty and other public

figures have publicly disclosed their own battles against the illness.

In this question and answer session, UKPIA aims to increase the perception within the safety critical environment, looking at how mental health illness affects the patient, their families and equally as importantly, work colleagues and the organisations which they work for.

The presentation is intended to provoke conversation within the workshop and provide people with the opportunity to discuss how the issue is currently being dealt with and how matters may be improved in the future.

Biography: Jamie Walker is Safety, Projects & Associate Membership Director at the UK Petroleum Industry Association (UKPIA). Prior to joining UKPIA in May 2016, he worked in senior management roles for Puma Energy and Murco Petroleum. He currently provides Secretariat support to the Major Hazards, Rail and Road Working Groups; Process Safety Leadership Network and Petrol Retailers Safety Group.

10. The Role of Third-Party Testing in Securing Industrial Internet of Things (IIoT) compliance

Presenter: Matt Jakuc - CSA Group

Abstract: The Industrial Internet of Things (IIoT) is well on its way to becoming perhaps the most significant of all the 'industrial revolutions' to date and the most complex. With some projections claiming a 300% increase in IIoT ready devices in just the next 4 years (some 22.5 billion by 2021), and other forecasts suggesting that IIoT investment will make up as much as 40% of some organizations' capex budgets, the Internet of Things in the Industrial space is already well and truly here.

During this presentation we will uncover: 1. Challenges & risks in IIoT – covering Hazardous Locations, Functional Safety and Cybersecurity. 2. Steps to limit the likelihood of such incidents and their impact. 3. Keys to third-party evaluation and testing. 4. Steps to successful attestation and certification of connected devices

Biography: Matt Jakuc is the Global Business Manager for Cybersecurity Services at CSA Group. With a background in electrical engineering, he has more than twenty years' experience in product research and development across the areas of the architecture and design of SCADA systems, production automation equipment, consumer electronics, and embedded systems. He is currently focused on cybersecurity services that improve the safety and security of IIoT and IIoT products.

11. Industry 4.0 and LoRa for maintenance purposes in hazardous areas

Presenter: Gido Van Tienhoven - Ex-Machinery

Abstract: This paper focuses on the use of various sensors to monitor the technical state of various types of equipment by means of LoRa Wan technology. LoRa is short for Long Range. It explains how this technology can reduce maintenance costs thanks to preventive maintenance.

The results of a small study amongst end users about the opportunities for this technology will be presented. The result will show examples like monitoring the technical state of a pump by means of the vibration level. Other examples are temperatures of bearings, leakage detection, etc. Interaction with the people attending will be stimulated on this subject.

Biography: Gido van Tienhoven is an explosion safety specialist who works with companies and organisations where there is gas and dust explosion risk to advise on the best ATEX solutions. He has worked in the field of explosion safety for 15 years and has developed a range of HVAC products and wireless solutions for hazardous areas. His company, Ex-Machinery, won an FD Gazelle award in 2017 for being one of the fastest growing companies in The Netherlands.

12. Paperless Safety Lifecycle at the R.STAHL Plant & Engineering Center

Presenter: Stefan Hack - R.STAHL

Abstract: For the protection of people, the environment and the plants themselves, the process industry utilises different kinds of safety systems in its plants. To ensure the functionality of these systems, maintenance is required. Plant operators are obliged to perform inspections, evaluate the results and archive the protocols. These inspections lead to a huge amount of effort for all affected people due to a lot of different issues discussed in the following. R.STAHL has been working to improve this process.

The Plant & Engineering Center offers a modern application that comes with a holistic approach to optimise periodic inspections and to relieve all people involved. Its three modules – PEC-EX, PEC-FS and PEC SQ – provide paperless inspections for hazardous area equipment, for safety instrumented systems and for all other required inspections concerning operational safety and quality.

Biography: Stefan Hack is Business Development Manager at R.STAHL, having joined the company in 2017 to work on the management of safety systems with a particular focus on explosion protection and functional safety. He is now working with companies in the chemical industry to optimise their documentation and inspection of their plants' safety systems.

DAY TWO- 1/3/2018 – FUNCTIONAL SAFETY AND SAFETY CULTURE

13. Functional Safety Management of Installed SIS**Presenter: Nic Butcher – Health & Safety Executive**

Abstract: The requirements for functional safety management are set out in good practice BS EN 61511 but the lifecycle described is focused on new SIS which may leave some conspicuous gaps in dutyholders' understanding of the requirements for their range of existing installed SIS, which might have been implemented to an older standard or earlier versions of BS EN 61511.

The Health and Safety Executive has been working with the Chemicals and Downstream Operators Forum (CDOIF) to develop a set of pragmatic guidelines on how to manage installed SIS that describes the procedures and processes required including a process of periodic review and assessment.

Biography: Nic Butcher is an ECI Specialist Inspector at the Health & Safety Executive where he has worked for nine years. His main roles include inspection of COMAH regulated sites and investigation of incidents covering functional safety and control systems, including cyber security and electrical ignition hazards. He is a Chartered Chemical Engineer with a background as a Control System Design, Installation and Commissioning Engineer for a leading control systems vendor.

14. No Safety without Security – No Security without Safety**Presenters: Tino Vande Capelle - TVC, & Steve Smith - ONRIX gcv**

Abstract: This joint presentation by consultants Tino Vande Capelle and Stephen Smith will look at the history of functional safety and provide a practical approach to cybersecurity in industrial environments, with a common feature being the human factor as the weakest link.

What have we achieved after 20 years of Functional Safety standards in the process industry? Why does it remain so difficult to learn from mistakes others have made in our industry? Human nature does not like to admit or reveal knowledge of problems. So, for the past 30 years, certain standards have helped engineers apply good engineering practices, but the weakest link in the safety culture remains the human being. Standards such as, but not limited to, DIN 19250, ISA 84.00.01, IEC 61508 & 61511 have been put in place to force a safety culture in our industry in the hope of achieving a better world where people, environment and investment can be safe. Tino's aim is to summarise and simplify some of the pitfalls that you may face in the future

Cybersecurity is often represented in the media through malware and hacking attacks. But little is written about the cause and effect of such attacks. Stephen will present pragmatic considerations concerning the problems and mitigation activities of cybersecurity; this inevitably centres on the human factor. Safety and quality activities in all industrial environments focus on the people and their actions; security is no different, it is much of the same in disguise. Unfortunately, the disguise is presented as being complex and forbidding. In closing, Stephen's aim is to shine some common sense on the subject and demystify the subject of industrial security.

Biographies: Tino Vande Capelle is a Senior FS Expert and Trainer for Safety Instrumented Systems (SIS) and his company is an accepted course provider for the TÜV Rheinland Functional Safety Program, on which he has trained over 2,000 people worldwide. He was educated in Belgium where he gained qualifications in Automation & Critical Control Systems and his 30-year career has involved roles in the LNG, Petrochemical, Refining and Petroleum Industries.

Stephen Smith is an independent advisor on digital security risks and has spent more than 30 years in the ICT industry with a focus on information security, with a particular focus on the risks associated with industrial control systems. He resides in Belgium and provides digital risk services to local and international companies.

15. Certification of Robotics in an Ex environment - ATEX and Functional Safety Requirements**Presenter: Hassan El Sayed - CSA Group**

It is the responsibility of manufacturers and design engineers to integrate protection concepts listed under EN/IEC 60079 series to demonstrate full compliance against the ATEX Directive when products are to be used in hazardous areas within EU member countries.

Compliance with the harmonised standards for potentially explosive atmospheres can be a challenging task, especially if the product cannot be fully certified to EN/IEC/ISO series due to excessive voltage range or if the application contains potential explosive source where the existing protection concepts cannot offer the safety measures required.

This paper discusses the certification requirement of a safety related controller located in a safe area as a safety related device to control and manipulate the implemented safety functions built in a robot located in a hazardous area, where the robot is partially certified to meet certain types of protection concepts to EN/IEC 60079-series. It also discusses the special protection concept (s) using IEC 60079-33 where safety achieved by functional safety and other protection concepts assessed to EN/IEC/

ISO are coupled to deliver a fully certified product for use in a hazardous location.

Biography: For almost a decade, Dr Hassan El-Sayed has held the position of Functional Safety Business Manager for the CSA Group, responsible for FS business development. During this period, he has delivered over 150 projects for at least 50 customers, covering FS products assessment, FS training, company certification for system integrators and EPC for compliance against IEC 61508 and IEC 61511, Safety of machinery and Safety devices for use in hazardous areas.

16. Recent changes in regulations governing PPE**Presenter: Frank Angear - British Safety Industry Federation**

Abstract: With the new PPE Regulation (EU) 2016/425 coming into force it is vital that both commercial operators and users of product understand the implications, and that there is a consensus of understanding.

Personal Protective Equipment plays a vital role in ensuring that occupational safety and health is maintained. We are both in the midst of Brexit and in the middle of the timeline for the new Regulation becoming applicable and being applied exclusively from 2019.

BSIF's seminar will take delegates through a step by step process illustrating the actions that must be executed to ensure that products are in compliance.

As those involved in the PPE market are aware, the risks and therefore the products providing protection are placed into risk categories (Categories I, II & III) and each category requires a range of compliance actions and differing levels of quality assurance once any necessary type testing and EU examination certificate has been granted. The presentation will walk the audience through the process in logical bite-sized steps.

Biography: Frank Angear is General Manager of the British Safety Industry Federation, controlling the Secretariat function for all BSIF Associations, Product Groups and Working Groups, as well as liaising with UK and EU bodies on issues affecting the PPE sector. He has over 40 years' experience of the industry, mainly in sales and marketing positions, and is a member of a number of Technical and Standards Committees, including BSI and ISO Standards Drafting Groups.

17. Fire Prevention Plans**Presenter: James Daley - RPS Risk Management**

Abstract: Does your site store combustible waste and have a permit? Your site may need to meet the latest requirements of the Environment Agency and National Resource Wales FPP Guidance.

A Fire Prevention Plan (FPP) is a document required and enforced by regulators (i.e. the Environment Agency (EA) and Natural Resources Wales (NRW)) as a condition of a waste site's Environmental Permit. The FPP forms part of the overall management system and sets out the fire prevention measures and procedures used on site to meet distinct fire prevention objectives.

This paper will provide practical worked examples of how various sites can comply with the EA's and NRW's guidance, by providing detailed calculations and scientific evidence in their FPP, and thus satisfying the relevant regulatory body.

Biography: James Daley is a Fire Safety Engineering Consultant at RPS Risk Management and an associate member of the Institution of Fire Engineers (IFE). He works predominately in the nuclear and process industries and has gained experience in conducting nuclear and conventional fire safety assessments, DSEAR/ATEX inspections and various Hazard Studies (HAZOP/HAZID).

18. Fire detector mapping – what metrics should we be using?**Presenter: Tim Jones - MMI Engineering**

Abstract: Fire and gas detector mapping using computational methods has become more and more common in hazardous industries in recent times. Despite the advances in the technology and methods associated with fire detector mapping, one of the most important aspects is how we deem a detection system adequate with respect to the coverage it provides.

This paper aims to show the deficiencies in measuring detector coverage based on percentage coverage alone and presents the advantages of alternative methods, such as optimising your system to ensure that no fire above a certain size can go undetected e.g. 1m spherical fire. The work presented within this paper uses MMI's in-house fire detection code which uses ray casting techniques in a fully three-dimensional manner to account for obstructions that block a detector's line-of-sight.

Biography: Tim Jones is Senior Consultant at MMI Engineering, having been with the company for 11 years. He has Masters degrees in both Mechanical Engineering and Process Safety and Loss Prevention, and worked for BAE Systems for three years following graduation in a number of analytical roles. His area of focus is fire and explosion management in the oil and gas, nuclear and pharmaceutical industries and he has experience in safety assessments of both onshore and offshore facilities.

19. Cybersecurity - What should Safety Instrumented System Integrators be doing?

Presenter: Chris Parr - Sella Controls

Abstract: There is increasing momentum in the process industries to address cyber security risks associated with Industrial Automation and Control systems (IACS) and the publication of the UK Health and Safety Executive Operational guidance (OG-0086) on the subject matter is likely to see this focus increase.

Safety Instrumented Systems (SIS) are recognised as a primary protective layer for many Oil and Gas and Petrochemical facilities. Whilst the specification, design techniques and assessment of the integrity of these systems is well understood through industry guidance and standards such as BS EN 61508 and BS EN 61511, best practice for protecting these systems from security threats throughout their lifecycle is less clear. However, it does appear that IEC 62443 "Security for industrial automation and control systems" will become the de-facto guidance and is referenced in both BS EN 61511 and the HSE's operational guidance.

This presentation will introduce Part 2-4 of IEC 62443 and explain why compliance is good for both the system integrator and their clients. It will also draw on the presenter's own experience of applying the standard in a safety systems integrator environment and highlight the challenges and opportunities faced.

Biography: Chris Parr is Technical Director at Sella Controls. He is a Functional Safety Specialist and EC&I Engineer with over 22 years' experience in the specification, design modification and maintenance of process control and safety instrumented systems across multiple industry sectors. Chris leads the company's functional safety consultancy business and is an approved SIL study facilitator and functional safety assessor for a number of organisations. He is also a director of CASS, a UKAS accredited Functional Safety Management assessment scheme.

20. When Safety meets Security, Combining the Best of Both Worlds

Rob Turner - Yokogawa

Abstract: The latest edition of IEC 61511-1 "Functional Safety – Safety Instrumented Systems for the Process Industry Sector" requires that the existing risk assessment process for a safety instrumented system should now include an assessment of cyber security vulnerabilities in addition. At first sight this might appear to be an additional burden for the process industries and an intrusion into the jurisdiction of IEC 62443 which already covers the security of these systems.

And yet these two standards might not be so far apart in their approach. This presentation explores:

- 1) The need for a tie between safety and security for industrial control systems, and safety instrumented systems in particular.
- 2) The areas of common ground between IEC 61511 (functional safety) and IEC 62443 (industrial cyber security).
- 3) How to potentially combine the best of both standards and achieve a control network that is safely secure, and securely safe.

Biography: Rob Turner is the Team Lead for Yokogawa's Advanced Solutions group in the UK and a consultant in industrial cyber security. In a career spanning over 35 years, he has been actively engaged as both an engineer and a technical consultant in control, automation and industrial IT. At the beginning of 2017 he became a qualified Global Industrial Cyber Security Professional (aka GICSP) through the SANS Institute.

21. Are luminaires causing hidden risks in Ex Areas because of LEDs?

Presenter: Tarmo Rintala - Atexor Oy

Abstract: The potential risks of high-powered LED luminaires have been known for years. Those risks are growing as LEDs get more and more powerful. It is equally clear that the interpretation of the standards meant to ensure the safety of these luminaires has been anything but consistent.

In September 2016, at the IECEx meeting at Umhlanga, South Africa, The chairman of the Ex Technical Advisory Group (ExTAG), Professor Xu Jianping, presented the issues regarding LEDs and the possible ignition sources caused by powerful light.

The main message is clear: There are too many different interpretations of the standards, and this is resulting in compromises on safety.

The number of LED luminaires for applications where flammable vapours and particles are present is increasing rapidly. The risk of ignition may be significant if the optical radiation has not been accounted for in the design of the luminaires.

When selecting equipment for areas with possible risk of explosion, due care must be taken. All companies do not necessarily have experts qualified to understand the differences in the safety of products. Often the purchaser is just checking that the Ex certification exists, and not digging into the details of what that certification actually covers. The person responsible for selecting and accepting

products must be able to trust the certification and other information on a product.

The problems with current practices are systemic, and they are leading us to a situation where Ex classified sites have an increasing number of LED luminaires which may not be safe to use at the site. Thanks to Professor Xu Jianping, the issue of optical radiation is properly out in the open. This is huge step, but still only the first in ensuring the safety of high tech lighting systems.

Biography: Tarmo Rintala is Technology Manager at EX lighting specialist Atexor Oy in Finland, where he has been since September 2013. Prior to that he held a number of senior positions at Centaurea Oy.

22. Coldflow in cables – some practical advice

Presenter: Geof Mood - CCG Cable Terminations Ltd

Abstract: The subject of coldflow in cables is poorly understood and this has led to widespread confusion amongst designers, specifiers and installers, particularly in the selection of suitable cable glands to use with affected cable in Ex applications. BS EN / IEC 60079-14 states that the installer should 'select cable glands to reduce the effects of coldflow characteristics of cable'. However it fails to define what is or is not cable with coldflow characteristics or how it is possible to reduce the effects of coldflow, and if possible how much reduction is needed. This has given some cable gland manufacturers the opportunity to make exaggerated claims for their products and to create an atmosphere of fear amongst specifiers and installers, having them believe that coldflow in cables is a risk in applications where it is not.

This paper will debunk a number of common myths. It provides some practical guidance about what coldflow really is and shows a simple and cheap test method to determine if cables are affected by it. It will also provide straightforward advice about how to eliminate the effects of coldflow and achieve a safe installation if the cable being used is at risk of coldflow. The advice is strictly in compliance with BS EN / IEC 60079-14 and will lead to safer, and in many cases also cheaper, installations.

Biography: Dr Geof Mood has spent over 40 years in engineering research work, product development and manufacturing, leading to his current position as Technical Director for CCG Cable Terminations Ltd. More than half of his career has involved product certification to various standards and for the last 11 years he has specialised in high quality cable glands and accessories for use in industrial and hazardous areas. He is a member of several national and international standards committees.

23. Electrostatic Hazard Awareness for Managers and Engineers

Presenter: Mike O'Brien - Newson Gale

Abstract: This presentation will:

- Outline why static electricity is an ignition risk in the chemical industry.
- Provide case studies and analysis of incidents resulting from the ignition of flammable atmospheres due to discharges of static electricity.
- Describe what measures electrical equipment specifiers, production managers and QHSE managers can take to eliminate the ignition risks of static electricity.
- Correlate these measures with the guidance stipulated in IEC 60079-32-1: "Explosive atmospheres - Part 32-1: Electrostatic hazards - Guidance".
- Present novel ways of grounding multiple components at risk of electrostatic charge accumulation.

Biography: Mike O'Brien is Managing Director of Newson Gale, the market leading supplier of static grounding and bonding equipment. He has written numerous published articles on the subject of static electricity and its relevance to the hazardous process industries. Mike holds an honours degree in Mechanical Engineering, an MBA and is a Chartered Marketer with the Chartered Institute of Marketing.

24. Making excellence a habit - How to improve performance, reduce risk and achieve sustainable growth in the area of explosive atmospheres

Presenter: Sarra Cheyne – British Standards Institution (BSI)

Abstract: Risk management and assessment is necessary across many business processes, not just areas such as health and safety. Explosive atmospheres in the workplace can be caused by flammable gases, mists or vapours or by combustible dusts. Explosions can cause loss of life and serious injuries as well as significant damage. Guidance and standards can help avoid a potentially explosive scenario.

This presentation will show how a business can reassure shareholders, customers and employees that by managing risks it is being effectively managed and confirm its compliance with corporate governance requirements.

Biography: Sarra Cheyne is a Standards Programme Manager at BSI, managing the Explosive Atmospheres standards portfolio and is secretary to the UK Ex committees. Before joining BSI, she was a civil servant for 11 years at the Department for Education and at the former Department of Energy and Climate Change.

1. Keynote - Cybersecurity: Is the UK prepared to address the risks?

Weds 9.30 – 10.10: Main conference room



Sarabjit Purewal - Head of Operations, Health & Safety Executive (HSE)

Sarabjit graduated in Electrical Engineering from Imperial College London in 1976, and trained and worked with the Central Electricity Generating Board (CEGB) in engineering design, project and contract management on both conventional and nuclear power stations.

He joined Kennedy and Donkin Consulting Engineers as Engineering Manager providing consultancy services to UK power industry in 1989. After 6 years he joined Mott MacDonald as Divisional Director of Control and Communications Division providing a range of consultancy services in power, water, transportation and oil & gas industries worldwide.

He moved to the HSE in 2000 with the Technology Division providing specialist support to HSE and since then has worked as a policy advisor on health and safety to the Minister in Department of Work and Pensions, and currently acting Head of Operations, ECI.

He is a chartered engineer, associate of City and Guilds Institute, and member of the Institution of Engineering and Technology (IET).



Tony B - Head of Penetration Testing and CNI Capability, UK National Cyber Security Centre (NCSC) Operations Division.



The NCSC was established in October 2016 by GCHQ and is helping to make the UK the safest place to live and do business online. Our speaker is responsible for building NCSC capability to help improve the resilience of UK Critical National Infrastructure.

The keynote will cover the work that central Government is doing, including setting up to the National Cybersecurity Centre, its remit, what the landscape looks like and what we know about the energy and chemical industries sectors.

The new Network Information Security (NIS) directive will be transposed into UK law in late 2018, which will bring obligations for industries to manage risks to critical services and consequent penalties for non-compliance or loss of service. Although regulatory decisions will lie solely with the Competent Authorities, NCSC plays a leading role in advising industry and will share their approach to providing supporting guidance to the implementation of NIS.

HSE will share the outcomes from the field trials on the application of its operational guide, development of case studies, the strategic approach for regulating cybersecurity from 2018 onwards and the role industry can/is playing in addressing this topic.

The challenges, and risks looking ahead to the UK energy and chemical industries sector will be explored and what government is doing to assist.

2. Digitalisation changes everything

Weds 10.15 – 10.55: Main conference room



Ian Curtis - Process Safety Systems Consultant, Siemens

Ian has more than 25 years of professional experience working for control, automation and instrumentation vendors. For the last twelve years he has been specifically focussed on safety instrumented systems in the process sector.

His current role involves international responsibility for the development of process related functional safety business for Siemens to which he brings knowledge and experience of the market, products, systems and standards employed. Ian is a TÜV certified Functional Safety Engineer and a Siemens Functional Safety Professional.

Digitalisation changes everything - a bold statement ... but you don't have to look too far to find examples of where digitalisation has proven to be disruptive.

Now digitalisation is being described as bringing about the next big industrial revolution (or Industry 4.0 as it is sometimes called) promising a quantum leap in terms of benefits to productivity, flexibility, quality... but what of safety? Surely digitalisation offers the scope for improvement in process safety?

The “digitalisation” topic is still somewhat fluid and fast moving and exactly what form it takes differs from one industry to another. Discrete manufacturing topics include collaboration between cyber physical systems; using the internet of things and the internet of services; digitalisation of the whole value chain to achieve increased flexibility and productivity.

For the process industries the emphasis is slightly different so digitalisation for process involves the integrated engineering and integrated operation of process plants across the whole plant life-cycle but also incorporates topics such as digital twins and Big Data.

Integrated engineering and operation offer scope for improving safety by reducing the scope for systematic errors throughout the lifecycle. The concept of the digital twin can significantly improve verification and validation along with training for operation and maintenance. A “digital twin” can be used to thoroughly test the automation layer including the SIS. Simulation is nothing new but the ability to auto-generate the simulation from a common data model helps avoid mistakes. Verification testing of the “digital twin” uses the same code as will eventually be running in the SIS. Of course the validation of the safety system will still need to be done “in the real world” when the SIS is hooked up to the physical equipment but effective verification and validation during pre-FAT can help reduce the time taken at FAT and SAT.

Increased digitalisation also facilitates ease of data collection and improves the ability to consolidate data across disparate systems into the Cloud to help avoid silos of data. Big Data has the potential to contribute to process safety in a number of areas:-

- Plant reliability and Asset Integrity
- Steady State Process Control
- Process Optimisation
- Accident Investigation
- Collating leading indicators for process safety
- Use of data from maintenance systems and incidents to promote process safety.

This paper seeks to give an overview of digitalisation in a process industry context focussing on the potential benefits for safety.



3. Safety & Security: The last line of defence is restored

Weds 11.30 – 12.10: Main conference room



Dr Alexander Horch - VP Research, Development & Product Management, HIMA

Alexander Horch (M.Sc. Engineering Cybernetics, University of Stuttgart, 1996; PhD Automatic Control, Royal Institute of Technology Stockholm, 2000) was formerly Principal Scientist at ABB Corporate Research in Germany, focusing principally on process plant optimisation and plant asset management.

Between 2007 and 2016 he held different management roles in the areas of process control systems and automation of electrical grids, smart grids, manufacturing plants, robotics as well as Industrial Internet (Industrie 4.0) for ABB Germany and ABB Switzerland.

Alexander Horch is a Certified Project Management Professional (PMP) and a Certified Automation Professional (CAP) of the ISA. His R&D work is complemented by publications and seminars, regular lectures at the University of Stuttgart and ETH Zürich, as well as work for standardisation organisations.

Since April 2016 he has been Vice President Research, Development & Product Management at HIMA Paul Hildebrandt GmbH in Brühl, Germany, a leading supplier of safety-related automation solutions for the process, rail and logistics industries.

The advancing digitalisation has an effect on almost all business processes, especially in the industrial sector. Machines communicate with people and increasingly also amongst themselves. What does this mean for security? Safety controllers have historically focused primarily on emergency shutdown requirements, not from the cyber-security perspective.

For effective Cyber-Security, it is not enough to upgrade an existing product by adding additional software functionality. Every solution for functional safety must be conceived and developed with cyber security in mind, right from the start. This applies equally to the firmware and the application software. Safety systems, which offer the fewest attack possibilities, represent the most effective defence against cyber attacks. Reduced controls on necessary security functions are protected against typical attacks on IT systems.

Safety-oriented systems are the last line of defence in a production facility. The implementation of effective cyber-security measures is particularly important. A crucial point is the minimization of human intervention, since humans are the most frequent cause of cyber risks. These include both targeted cyber attacks to disrupt production processes or steal industrial secrets, as well as incidents caused by carelessness. An effective protection concept includes, for example, special access protection, physical security or plausibility checks on changes. In addition, users need to take organisational measures, such as periodic testing of internal networks through penetration tests or security training of their own employees. Because, when employee passwords become known, a hacker attack becomes child's play.

In addition, the intelligent use of existing data from the security network, for example for predictive maintenance or process optimisation, now also allows operators to improve the efficiency of their systems by reducing downtime.

The safety system is particularly suitable as a source of relevant information since a large amount of data is generated in safety control systems. Dr Horch will explain how this can be done.

4. Toward an IoT Platform for Hazardous Locations

Weds 12.15 – 12.55: Main conference room



Thomas P. Ventulett – CEO, Aegex Technologies

Under his leadership, Aegex developed the first Windows 10 industrial tablet universally certified as intrinsically safe for ATEX/IECEX Zone 1 and UL CI, II, III Div 1 hazardous locations in oil & gas, chemical, pharmaceutical and other operations with explosive atmospheres worldwide.

Mr. Ventulett is leading his team's efforts to provide additional intrinsically safe solutions including a certified Internet of Things platform for hazardous locations that connects people and things in hazardous areas to the cloud in real-time, providing data that can be used to improve safety, efficiency and productivity.

He has more than 25 years of experience in executive roles in network and communications technology ventures.

Toward an IoT Platform for Hazardous Locations: Examining the Collaboration of Humans and Edge Technologies in Disaster Scenarios for Insight into Industrial IoT for Extreme Operations

As more and more industrial organisations are adopting Internet of Things (IoT) strategies and beginning their digital transformation to Industry 4.0 or Smart Manufacturing, they face challenges in adopting technologies due to regulatory restrictions for highly combustible atmospheres such as exist in some of the world's largest and most critical industries - oil & gas, chemical, pharmaceutical, energy, utilities, food processing, defence and others.

In ATEX/IECEX Zone 1 or UL Class I Division 1 hazardous areas worldwide, up to 15% of personnel do not have access to mobile devices unless they are certified "intrinsically safe," or incapable of causing a spark that could ignite a combustible environment.

Thus, the human "sensor" in hazardous area operations, who could conceivably detect perceived anomalies or problems in the maintenance, workflow, process or function of these operations, is relegated to recording observations with pencil and paper and then entering data manually into ERP systems hours or days later. Such lack of real-time communication and data management results in inefficiency, increased costs and elevated safety and asset risk, causing potential down-time and even loss of life in extreme cases.

By deploying new IoT technologies that allow people to use technology inside Zone 1/Division 1 hazardous areas, humans can actively interact with machines in real time to dramatically improve productivity, safety and the bottom line in hazardous operations. A new style of IoT platform built especially for hazardous area operations, would need to include various and affordable types of sensors to cover vast spaces, real-time communications, cloud computing, machine learning, rights management, security, big data storage, analytics and user-friendly visualisation, all functioning in highly explosive conditions.

This paper considers the possibilities for an IoT Platform for Hazardous Locations, based on hands-on research conducted by Aegex Technologies, Verizon, Nokia and multiple technology partners that tested various edge technologies with first responders in realistic disaster scenarios during Operation Convergent Response (#OCR2017). The event provided a unique opportunity to test IoT under extreme conditions, such as a staged chemical plant explosion, subway terrorism incident, neighborhood flood, cybersecurity attack, tornado disaster and hostage rescue.

The results gave insight into the need for continued collaboration on IoT capabilities that can better manage not only emergency response, but everyday operations in hazardous industries.

5. Lessons learned from major accidents in different industrial sectors

Weds 14.00 – 14.40: Main conference room



Zsuzsanna Gyenes – Deputy Director, IChemE Safety Centre (ISC)

After graduating with a Master of Science in Biochemical Engineering from the Technical University of Budapest, Dr. Zsuzsanna Gyenes worked in disaster management for the Hungarian Government.

During this time she obtained a Postgraduate Diploma in Environmental Public Administration. She then moved into a role as a Seveso Site Inspector for Hungary, at this time she also obtained her PhD cum laude on the development of procedures and tools for the improvement of industrial safety against external effects from the National Defence PhD Institution in Military Technology in Hungary.

Following her time as a Seveso Inspector, she was the Head of Section for Nuclear Safety in the National Directorate General for Disaster Management in Budapest. Her most recent role was as a Scientific Technical Office for the European Commission Joint Research Centre, where she worked to assist member states on learning from incidents and Seveso implementation, including land use planning policy.

She commenced as the Deputy to the Director of the IChemE Safety Centre in September 2017.

Petrochemical and chemical industries store and process a large amount of dangerous substances in complex chemical establishments. For this reason, consistent care in controlling the processes and their related equipment is necessary at these sites to avoid a loss of containment that could lead to a serious accident. In reality, hundreds of chemical accidents are reported in the media around the world in an average year.

Many of them have severe consequences, such as production disruption resulting in significant economic loss, temporary loss of public services, property damage, environmental damage and in the worst circumstances, injury and death. In many cases, lack of knowledge or procedures in place or lack of competence, even complacency, led to the incident.

This paper studies incidents chosen from different industrial sectors and different topics, including fertilisers, contract worker related cases, ageing of establishments or emergency response. These cases seem diverse but in reality, the lessons depicted show similarity and these findings demonstrate that learning from other industries or topics is indeed possible. Furthermore, the study highlights events where the lessons were not learnt, even though similar cases had occurred already in the past.

The analysis of the cases selected covers lessons learned from these incidents and forms a summary of how to get industries to pay more attention to factors they had not previously considered might contribute to a major event. Furthermore, looking at past accidents and learning from cases that have occurred in other industrial sectors can help us learn important lessons. Finally, the study emphasises the importance of an effective safety management system in place, regardless of the type of industrial activity.

6. When the lights go out

Weds 14.45 – 15.25: Main conference room



Roger Stokes – Principal Engineer, BakerRisk

Roger Stokes graduated from UMIST as a Chemical Engineer in 1982 and joined ICI's Mond Division where he initially worked in a technical capacity on various plants and projects including chlorine/ caustic, chlorinated solvents and chlorinated paraffins.

In 1987 he moved into plant management, first on a chlorinated rubber resins plant and then PVC. In 1992 he joined a firm of Loss Adjusters dealing with commercial insurance claims including fires, explosions and machinery breakdown on chemical, petrochemical, food processing and other manufacturing facilities. This took him to various parts of the globe where he encountered numerous types and sizes of incidents.

He joined Baker Risk in 2015 and works out of the UK office as part of the Process Safety Group, where his work is currently focused on accident/ incident investigation and insurance risk engineering.

Processing facilities require a reliable supply of electrical power. The consequences of a sudden power loss ranges from an inconvenience to a major incident with consequences including damage to equipment, failure of emergency systems, loss of containment, fires, explosions and environmental impact. Damage during restart can also be a major issue. The increasing reliance on automated systems for control, emergency shutdown and mitigation means that power supplies and back-up systems must be much more reliable than in the past.

There have been many incidents where loss of external power has been a key factor and there are opportunities to learn from these events when assessing the design criteria and maintenance requirements of supplies and back-up systems. Typical facilities that require a reliable supply of power include offshore platforms, oil refineries, petrochemical, chemical, pharmaceutical, plastics, glass and nuclear industry facilities.

Power is not only required for process control and for driving the plant and machinery; it is also a crucial link in the chain for provision of services including steam, air, process water, cooling water, nitrogen, lubrication and emergency systems. There have been several instances where even a brief power loss has led to the cascade failure of services, which has then resulted in a major incident.

Causes of power supply failure include: Fires in substations and switch-houses, faults/ human error when working on switchgear, underground cable faults, excavations and other works damaging underground cables, vehicles striking overhead cables, lightning strikes and storm/ flood/ tsunamis.

Typical protection from power loss include uninterruptible power supplies (UPS's), emergency power generators, services back-up (stand-by boilers, nitrogen back-up for air, gravity fed cooling water/ lubrication). These don't always work.

Procedures are written to include "load-shedding", manual activation of valves and critical safety systems. In a real situation, some of these may literally require working in the dark. There is a lot to do, few staff and little time to act.

Planning for power outage requires a thorough assessment of the scenarios that may occur, the possible consequences and the design and reliability of the measures that are in place. Novel ideas for low frequency/ high risk scenarios may need to be considered.

This presentation reviews some examples of incidents that have occurred to encourage operators to reconsider the potential impact of a sudden loss of power at their facility and how they would deal with such an event.

7. Risk tolerability targets; misconceived, misunderstood and misapplied

Weds 15.30 – 16.10: Main conference room



Carolyn Nicholls - Consultant, RAS Ltd

A director of RAS Limited, Carolyn is a process safety specialist by training, and has been in the risk and hazard management industry for over ten years.

Carolyn leads the RAS team of risk and hazard management consultants and has been instrumental in creating the company's assessment methodologies. Carolyn has experience of working with a number of UK COMAH sites to develop safety reports and provide support in all aspects of risk management, in particular developing emergency response plans, evaluating the economic impact of safety improvements and reviewing operational controls.

Her particular area of interest is the demonstration of ALARP, an often misunderstood concept.

Following on from a quantification (or semi-quantification) of risk, the next step in any assessment is to compare the result to a set of risk tolerability criteria. Three regions of risk are usually defined, an unacceptable region and a broadly acceptable region bordering a region of tolerable risk. The tolerability of this middle region is dependent on those risks being As Low As Reasonably Practicable (ALARP). The 2001 HSE publication 'Reducing Risks, Protecting People - HSE's decision-making process' (R2P2) is widely used in industry to set these region boundaries. R2P2 clearly defines the tolerability boundaries for individual risk, and gives guidance regarding societal (or group) risk tolerability.

How these criteria have been applied across the industry varies dramatically, particularly in setting targets for Layer of Protection Analysis (LOPA). LOPA is often used to identify the need for, and define the required integrity of, a Safety Instrumented System (SIS). In this context, it is easy to see how setting the wrong targets for a risk assessment can result in serious consequences. For example, setting a risk target that is too lenient could result in a process that is not adequately protected, and setting a risk target that is too onerous could result in the requirement to needlessly install a high integrity safety system at a significant cost. To set appropriate risk targets, the intricacies between types of risk need to be well understood, and applied correctly for the given situation. Our experience is that this is often misunderstood and misapplied, people take simple rules and apply them in the wrong context.

This paper considers the differences between individual risk and societal (group) risk, and how these are often confused and misapplied. Differences between scenario risk and whole site risk, and how these should be considered in different ways depending on the type of risk and the type of study are then discussed. Risk targets are proposed which may be used in LOPA, including a demonstration of how these were developed and how they meet industry and regulatory standards. How these targets can be used and adapted into existing or new facilities, and how they may interact with existing corporate risk criteria and matrices is also considered.

8. Safety culture, climate and performance improvement

Weds 11.30 – 12.10: Seminar room



Dr Kevin Fitzgerald – Risk Management Team Manager, Lloyd's Register Energy

Dr Kevin Fitzgerald manages Lloyd's Register's Risk Management Consulting team in the UK, which delivers risk consultancy support to clients in the Energy and other high hazard industries from offices in Manchester and Aberdeen.

Kevin started his career in the chemicals industry in North West England, with roles in research, operations and process safety, and he has almost 30 years' experience in high hazard industry.

As a consultant he has worked in the oil & gas, construction, utilities and marine sectors with clients across the EMEA region, including in Abu Dhabi, South Africa and the Netherlands as well as the UK and Scandinavia.

Kevin's professional focus is on helping organisations improve their safety performance via culture and systems and he has extensive experience of safety climate assessment, culture change and management systems development. He is a Chartered Engineer (CEng) and Member of the Institution of Mechanical Engineers (MIMechE).

The term 'safety culture' was first used in INSAG's (1988) 'Summary Report on the Post-Accident Review Meeting on the Chernobyl Accident'. Safety culture has subsequently been defined as: "Consisting of shared values (what is important) and beliefs (how things work) that interact with an organisation's structure and control systems to produce behavioural norms (the way we do things around here)."

It has also been described as simply "how people behave when no-one is looking."

Research over many years has demonstrated that incidents are almost always related to incorrect or inappropriate workforce behaviours, and it is the way that culture drives behaviour that is important to us. Within the process industries, incidents such as Longford (1998), Texas City (2005), Buncefield (2005) and Macondo (2010) have all served to highlight the importance of safety culture, along with other more specific human factors shortcomings.

The influence that an organisation's culture has on individual behaviour is generally acknowledged and many organisations worldwide have set themselves the goal of improving their safety culture so as to achieve lower incident rates. But what does safety culture really comprise, how do safety culture failings make themselves apparent, and how can we go about changing culture?

This presentation will:

1. Provide a brief introduction to the concept of safety culture and the characteristics of a positive safety culture.
2. Illustrate – through case studies – some consequences of safety culture failings.
3. Indicate how safety climate surveys can be used to help understand safety culture and how the output from these surveys can be used to prioritise issues for improvement.
4. Show some of the typical starting-points for safety culture improvement in organisations.

The presentation will draw on non-process sector experience (particularly Marine) to help illustrate the generic challenges that need to be managed in complex process safety environments.

9. Mental health awareness in a safety critical environment

Weds 12.15 – 12.55: Seminar room



Jamie Walker - Safety & Projects Director, UKPIA

Prior to joining UKPIA in May 2016, Jamie worked in senior management roles for Puma Energy and Murco Petroleum, his experience spanning many years. He worked extensively in logistics for 20 years and is a fully qualified DGSA.

In his role at Murco and Puma, Jamie represented his company on the UKPIA Road Transport, Terminal and Security Working Groups and sat on the DODF Professional Driver Passport Set Up Group.

He currently provides Secretariat support to the Major Hazards, Rail and Road Working Groups; Process Safety Leadership Network; Petrol Retailers Safety Group. Jamie represents UKPIA on Process Safety Forum; Chemical and Downstream Oil Industry Forum; Oil Pipeline Security; Energy Institute Process Safety, Downstream Distribution and Road Tanker Committees; Refinery and Terminal Operators Forum; Downstream Oil Distribution Forum; Forecourt Crime Steering Group and DfT Road Tanker Working Group.

The stigma around mental health has long been an issue. Fortunately, mental health awareness has recently been heightened as royalty and other public figures have publicly disclosed their own battles against the illness.

In this question and answer session, UKPIA aims to increase the perception within the safety critical environment, looking at how mental health illness affects the patient, their families and equally as importantly, work colleagues and the organisations which they work for.

The presentation is intended to provoke conversation within the workshop and provide people with the opportunity to discuss how the issue is currently being dealt with and how matters may be improved in the future.

Individuals who have, or are working with others who have, mental health issues and are engaged in process safety activities pose a risk if they are not managed correctly. The aim of the workshop is to provide a better understanding of possible warning signs and how to deal with sufferers who themselves may not be aware of their issues.

HSE have already stated that stress and mental health pose a significant threat to the workplace. UKPIA are currently working with Competent Authority and other Trade Associations and organisations with the intention of providing a co-ordinated and structured approach to dealing with the issue.

10. The role of third-party testing in securing Industrial Internet of Things (IIoT) compliance

Weds 14.00 – 14.40: Seminar room



Matt Jakuc – Cybersecurity Technical Lead, CSA Group

Matt Jakuc is the Global Business Manager for Cybersecurity Services at CSA Group. Mr. Jakuc holds a Master of Science degree in Electrical Engineering and has more than twenty years of experience in product research and development.

His professional experience spans across the areas of the architecture and design of SCADA systems, production automation equipment, consumer electronics, and embedded systems. He is currently focusing on cybersecurity services that improve the safety and security of IoT and IIoT products, including secure development lifecycle implementation, penetration testing, gap assessments, and certification programs.

The Industrial Internet of Things (IIoT) is well on its way to becoming perhaps the most significant of all the 'industrial revolutions' to date and the most complex. With some projections claiming a 300% increase in IIoT-ready devices in just the next 4 years (some 22.5 billion by 2021), and other forecasts suggesting that IIoT investment will make up as much as 40% of some organisations' capex budgets, the Internet of Things in the Industrial space is already well and truly here.

The major benefits of IIoT are well known – efficiency and reliability gains, coupled with the ability to record big data for remote analysis. Yet, the challenges and opportunities that IIoT brings in the quest for protecting lives requires an equal focus, particularly when you consider how IIoT will be incorporated into a Hazardous Location (explosive atmosphere). Here, there are a number of elements to consider, including continued hazardous location safety compliance, functional safety assurance and cybersecurity protocols.

The convergence of information technology (IT) and operational technology (OT) networks, has tremendously increased the risk of cyberattacks that may affect safety, reliability and availability.

Modern control systems are no longer isolated but are part of a larger connected infrastructure that can offer significant cost savings but also cybersecurity concerns. Security risks associated with integrating, modifying or maintaining a controller in process can impact overall safety and security. This changes the risk profile that should be considered when designing and/or integrating components in the systems.

Often, little consideration is made to their security requirements due to cost constraints. Vendors, system integrators and asset owners face challenges in keeping their systems secure including technical expertise and privacy concerns. The integrators, asset owners and facility managers need cybersecurity assurance when selecting potential hardware and software-based solutions. These solution should be specifically designed and formally evaluated to identify and prevent cybersecurity threats in industrial environments.

During this presentation we will uncover:

1. Challenges & risks in IIoT – covering Hazardous Locations, Functional Safety and Cybersecurity
2. Steps to limit the likelihood of such incidents and their impact
3. Keys to third-party evaluation and testing
4. Steps to successful attestation and certification of connected devices



11. IoT 4.0 and LoRa for maintenance purposes in hazardous areas

Weds 14.45 – 15.25: Seminar room



Gido Van Tienhoven - CEO, Ex-Machinery

Gido van Tienhoven is an ATEX and explosion safety specialist who works with purchasers, production managers and technicians in all process industries dealing with gas and dust explosion risks to help them find the best safety solutions for their particular needs.

He studied engineering at Delft University in The Netherlands and has worked in the field of explosion safety for 15 years.

Gido is the owner of Ex-Machinery, which offers a range of HVAC products and wireless solutions for hazardous areas. The company was awarded an FD Gazelle Award in 2017 to recognise its status as one of the fastest growing companies in The Netherlands.

This paper focuses on the use of various sensors to monitor the technical state of various types of equipment by means of LoRa Wan technology. LoRa is short for Long Range. It explains how this technology can reduce maintenance costs thanks to preventive maintenance.

The results of a small study amongst end users about the opportunities for this technology will be presented. Applications include monitoring the technical state of a pump by means of vibration levels, bearing temperatures, leakage detection, etc. Interaction with the people attending will be stimulated on this subject.

The paper will present LoRa as an international standard for IoT wide area networks, explaining how it works and of what use it can be. Due to the low amount of RF energy involved, it is technology that can be applied very well in hazardous areas without causing risks of ignition. Because LoRa technology requires low power it can use batteries, so field installation can be carried out without wires.

LoRa technology is node-hub technology. As a result, a few hundred sensors on a large plant can be easily connected to one hub. All the readings of the sensors can be seen on internet based systems and all communication via the internet is encrypted, with high levels of cybersecurity built into the design.

The paper will focus mainly on the applications and opportunities of LoRa in the oil and gas industry.



12. Paperless safety lifecycle at the R.STAHL Plant & Engineering Center

Weds 15.30 – 16.10: Seminar room



Stefan Hack - Business Development Manager, R.STAHL

After studying for a bachelor and a masters degree in industrial engineering, Stefan Hack worked at the University of Applied Sciences Jena, Germany, as a research assistant in the fields of software engineering and explosion protection. In the context of explosion protection, he worked on product development as well as solutions to manage inspections of ex-equipment.

In 2017, he joined R. STAHL to work on the management of safety systems, especially explosion protection and functional safety. He is now working with companies from the chemical industry to optimise the documentation and inspections of their plants' safety systems.

For the protection of people, the environment and the plants themselves, the process industry uses different kinds of safety systems in its plants. To ensure the functionality of these systems, maintenance is required. Plant operators are obliged to perform inspections, evaluate the results and archive the protocols. These inspections lead to a huge amount of effort for all affected people due to many different issues.

Inspection plans and intervals vary deeply depending on the kind of equipment, the legal basis and the standards that are taken into account. Safety systems concerning process control engineering have to fulfil a certain safety integrity level (SIL) and are considered as safety integrated systems (SIS). This determines the proof-test interval according to IEC 61508, with the scope of the test itself dependent on the equipment type.

Another big effort lies in providing equipment data and in filing the inspection protocols. To perform inspections, data from different fragmented IT systems is required. The design of the safety system is the result of a risk analysis in the beginning of the plant lifecycle. CAE-systems are used to create flow diagrams and equipment registers.

The Plant & Engineering Center offers a modern application that comes with a holistic approach to optimise periodic inspections and to make life easier for all the people involved. Its three modules – PEC-EX, PEC-FS and PEC SQ – provide paperless inspections for hazardous area equipment, for safety instrumented systems and for all other required inspections concerning operational safety and quality.

Instead of replacing the established CAE-, ERP and document management systems, PEC can be connected to them with automatically, bidirectional interfaces. This provides a high data quality, reduces data errors and saves a lot of time by offering the possibility to interact with all three systems through one application.

Within PEC-EX, inspection plans can be generated automatically. PEC-FS and PEC-SQ provide an inspection plan generator, which enables its users to work with individual inspection plans for each equipment that can contain standardised, reusable test blocks. An integrated Scheduler helps to keep track of deadlines. Inspection results can be evaluated to make sure standards can be met.

By offering an app for Android and Windows based tablets, PEC greatly reduces the amount of time spent on performing inspections. Protocols can be signed electronically and archived directly in PEC as well as being transferred to document management systems.

PEC is currently in use at several plants in the Niederrhein area of Germany and has already proven that it can help to save time, to be fully compliant with standards and to help improve data inspection quality.

13. Functional safety management of installed SIS

Thurs 9.30 – 10.10: Main conference room



Nic Butcher - ECI Specialist Inspector, HSE

Nic is a Chartered Chemical Engineer who has worked as a Specialist Inspector for HSE in the major hazard industries for nine years. Main roles include inspection of COMAH regulated sites and investigation of incidents covering functional safety, control systems including cyber security and electrical ignition hazards.

Prior to HSE, Nic had an industrial background working as a Control System Design, Installation and Commissioning Engineer for a leading control system vendor working on projects in the chemical, oil and gas and related sectors. He has also worked for a major bulk chemical manufacturing company on improvement projects for control and safety systems and for the Environment Agency.

The requirements for functional safety management are set out in good practice BS EN 61511 but the lifecycle described is focused on new SIS which may leave some conspicuous gaps in dutyholders' understanding of the requirements for their range of existing installed SIS, which might have been implemented to older standards or earlier versions of BS EN 61511.

The Health and Safety Executive has been working with the Chemicals and Downstream Operators Forum (CDOIF) to develop a set of pragmatic guidelines on how to manage installed SIS that describes the procedures and processes required, including a process of periodic review and assessment.

14. No safety without security – no security without safety

Thurs 10.15 – 10.55: Main conference room



**Tino Vande Capelle, Consultant, TVC, & Steve Smith,
Consultant, ONRIX gcv**

Tino Vande Capelle has over 30 years' experience in the process industry safety sector.

He is a Senior FS Expert (TÜV Rheinland, # 0109/05, SIS) and Trainer for Safety Instrumented Systems (SIS) and his company is an accepted course provider for the TÜV Rheinland Functional Safety Program, with 2000+ people world-wide now trained on the competency review program.

In the UK, he has worked with Exloc Instruments (UK) to provide FS Engineer (TÜV Rheinland) vocational SIS training for many years.

Stephen Smith is an independent advisor on digital security risks. He has spent more than 30 years in the ICT industry with a focus on information security and dedicated these past 10 years on risks associated with industrial control systems. He resides in Belgium and provides digital risk services to local and multinational companies in the utilities, manufacturing, transport and other sectors.

Stephen is also active in a number of associations dealing with security issues: the European Corporate Security Association (Belgium), the Industrial Cyber Security Center (Spain) and Industrial Cyber Security Services (The Netherlands).

His recent work with several companies has indicated that there is a growing concern with cyber threats, but that the general maturity level to deal with these threats is not ingrained in those organisations' risk management culture.

This joint presentation by consultants Tino Vande Capelle and Stephen Smith will look at the history of functional safety and provide a practical approach to cybersecurity in industrial environments, with a common feature being the human factor as the weakest link.

What have we achieved after 20 years of Functional Safety standards in the process industry? Why does it remain so difficult to learn from mistakes others have made in our industry? Human nature does not like to admit or reveal knowledge of problems. So, for the past 30 years, certain standards have helped engineers apply good engineering practices, but the weakest link in the safety culture remains the human being.

Standards such as, but not limited to, DIN 19250, ISA 84.00.01, IEC 61508 & 61511 have been put in place to force a safety culture in our industry in the hope of achieving a better world where people, environment and investment can be safe. Both the IEC61508 and IEC61511 are in their second edition as technology evaluates so does engineering culture. Tino's aim is to summarise and simplify some of the pitfalls that you may face in the future.

Cybersecurity is often represented in the media through malware and hacking attacks. But little is written about the cause and effect of such attacks. Stephen will present pragmatic considerations concerning the problems and mitigation activities of cybersecurity, which inevitably centres on the human factor.

Safety and quality activities in all industrial environments focus on the people and their actions; security is no different, it is much of the same in disguise. Unfortunately, the disguise is presented as being complex and forbidding. In closing, Stephen's aim is to shine some common sense on the subject and demystify the subject of industrial security.

15. Certification of robotics in an Ex environment - ATEX and functional safety requirements

Thurs 11.30 – 12.10: Main conference room



Hassan El Sayed – Functional Safety Business Manager, CSA Group

Hassan El-Sayed, BSc MSc PhD, CEng FIET FInstMC

For almost a decade, Dr Hassan El-Sayed has held the position of Functional Safety Business Manager for CSA Group, responsible for FS business development. During this period he has delivered over 150 projects for at least 50 customers, covering FS products assessment, FS training, company certification for system integrators and EPC for compliance against IEC 61508 and IEC 61511, Safety of machinery and Safety devices for use in Hazardous Areas.

Mr. El-Sayed has over 25 years of industrial experience in product design for FS, intrinsic safety and ATEX certification. He has published several functional safety papers for industry leading conferences and seminars and has received 9 patents (UK and US) in fieldbus physical layer products design for use in hazardous areas. His designed products are widely used in Foundation Fieldbus applications.

He received an award for excellence for a paper presented at ISR (49th Symposium on Robotics) held in July 2017 in Shanghai, China.

Mr. El-Sayed is an active member of several relevant technical committees including TC31/WG 42 (safety device), GEL 65/ 01 (61508), and SC65/MT61508 1-2 - functional safety IEC 61508 standard.

It is the responsibility of manufacturers and design engineers to integrate protection concepts listed under the EN/IEC 60079 series to demonstrate full compliance against the ATEX Directive when products are to be used in hazardous areas within EU member countries.

Compliance with the harmonised standards for potentially explosive atmospheres can be a challenging task, especially if the product cannot be fully certified to the EN/IEC/ISO series due to excessive voltage range or if the application contains a potential explosive source where the existing protection concepts cannot offer the safety measures required.

Product certification may require certain combinations of different protection concept techniques to provide the safety measures with respect to explosion risks and to meet a specific classifications or categories.

This paper discusses the certification requirement of a safety related controller located in a safe area as a safety related device to control and manipulate the implemented safety functions built in a robot located in a hazardous area, where the robot is partially certified to meet certain types of protection concepts to the EN/IEC 60079- series.

The task requires risk assessment of the hazard sources in order to allocate a Safety Integrity Level (SIL). The assessment studies the requirement for a safety system validation where safety related software shall be developed to comply with the requirements defined for safety devices as described in article 1, 1(b) of the ATEX Directive 2014/34/EU.

These requirements are also shown in section 1.5 of Annex (II) of the Directive. In particular, the ATEX Directive recommends the use of IEC 61508, EN 50495 or any equivalent safety related standard for the safety-critical software development. The article also discusses the special protection concept (s) using IEC 60079-33 where safety achieved by functional safety and other protection concepts assessed to EN/IEC/ISO are coupled to deliver a fully certified product for use in hazardous locations.

16. Practical effects of recent changes in regulations governing PPE

Thurs 12.15 – 12.55: Main conference room



Frank Angear - General Manager, British Safety Industry Federation (BSiF)

Frank Angear (DipM MCIM) is General Manager of the British Safety Industry Federation, controlling the Secretariat function for all BSiF Associations, Product Groups and Working Groups. Frank also maintains a running brief in developing the Federation's influence with the UK Government, Members of Parliament, the European Commission, the UK's Regulatory Bodies, and independent stakeholder organisations.

Frank has worked in the safety and health industry for over 40 years in national and international Sales, Training and Marketing roles within PPE manufacture, as well as maintaining active participation in a number of Technical Committees, Industry Working Groups, BSI Standards Committees and BSI and ISO Standards Drafting Groups.

With the new PPE Regulation (EU) 2016/425 coming into force it is vital that both commercial operators and users of product understand the implications and that there is a consensus of understanding.

Personal Protective Equipment plays a vital role in ensuring that occupational safety and health is maintained. We are both in the midst of Brexit and in the middle of the timeline for the new Regulation becoming applicable and being applied exclusively from 2019.

BSiF's seminar will take delegates through a step by step process illustrating the actions that must be executed to ensure that products are in compliance.

As those involved in the PPE market are aware, the risks and therefore the products providing protection are placed into risk categories (Categories I, II & III) and each category requires a range of compliance actions and differing levels of quality assurance once any necessary type testing and EU examination certificate has been granted. The presentation will walk the audience through the process in logical bite-sized steps.

17. Fire Prevention Plans

Thurs 14.00 – 14.40: Main conference room



Presenter: James Daley - RPS Risk Management

James Daley has a BSc(Hons) in Fire Safety and Risk Management and is an Associate (AIFireE) member of the Institution of Fire Engineers (IFE). He is a Consultant with RPS Risk (based in Warrington) and has worked in the Fire Safety and Risk Management industry for over four years.

James works extensively in the nuclear and process industries, and has gained experience in conducting nuclear and conventional fire safety assessments, Fire Prevention Plans (FPP), DSEAR/ ATEX inspections and various Hazard Studies (HAZOP/ HAZID).

Does your site store combustible waste and have a permit? It may need to meet the latest requirements of the Environment Agency and National Resource Wales FPP Guidance.

A Fire Prevention Plan (FPP) is a document required and enforced by regulators (i.e. Environment Agency (EA) and Natural Resources Wales (NRW)) as a condition of a waste site's Environmental Permit. The FPP forms part of the overall management system and sets out the fire prevention measures and procedures used on site to meet the following fire prevention objectives:

- Prevent fires/reduce the likelihood of fire occurring.
- Identify and restrict the size and duration of fires.
- Deal with situations that have the potential to cause fires.
- Respond effectively and appropriately to fires on site in liaison with the fire service.
- Protect the environment from the impact of fires.
- Control/extinguish a fire within an adequate timescale.
- Minimise the spread of fire within your site and to your neighbours.

The EA issued its first FPP guidance document in March 2015 (with NRW issuing their guidance document in May 2016). Following this, from July 2015 to 2016 a total of 237 FPPs were completed, of which 155 (65%) were rejected, leaving 82 (35%) accepted. Previous statistics revealed an acceptance rate of less than 10%. The EA issued its final FPP guidance in July 2016 (updated in November 2016), in response to a number of high profile fires at sites storing combustible wastes.

Before the introduction of the FPP guidance there was limited regulation on the amount of combustibles that could be stored in one location, the separation distances between respective waste storage locations and the period of time for which the waste could be stored. Consequently, the potential for very large fires through fire growth and spread was a risk and without suitable fire fighting means, this could be proliferated. The FPP guidance provides a means to reduce the initiation of a fire, prevent fire growth and spread and extinguish safely any fire that does start. Should a site wish to deviate from the FPP guidance, they may do. However, a full technical argument with competent advice will need to be presented.

This paper will provide practical worked examples of how various sites can comply with the EA's and NRW's guidance, by providing detailed calculations and scientific evidence in their FPPs, and thus satisfy the relevant regulatory body.

18. Fire detector mapping – What metrics should we be using?

Thurs 14.45 – 15.25: Main conference room



Tim Jones - Senior Consultant, MMI Engineering

Tim Jones has Masters degrees in Mechanical Engineering, Process Safety and Loss Prevention, all from the University of Sheffield. He joined MMI Engineering 11 years ago and is a Principal Consultant based in the Warrington office in the UK. Before joining MMI, Tim worked for BAE Systems for three years in a number of analytical roles.

His area of focus is fire and explosion management in the oil and gas, nuclear and pharmaceutical industries and he has experience in safety assessments of both onshore and offshore facilities. His main area of expertise is hazard modelling and probabilistic analysis, including explosion, gas dispersion and fire modelling using CFD and phenomenological methods. The variety of projects that Tim has worked on has led to him gaining experience at all stages of the project lifecycle, including FEED, detailed design and Brownfield.

Fire and gas detector mapping using computational methods has become more and more common in hazardous industries in recent times. Despite the advances in the technology and methods associated with such mapping, one of the most important aspects is how we deem a detection system adequate with respect to the coverage it provides.

At present, there is little guidance given by the UK HSE or other industry bodies on the definition of coverage and how it should be achieved. As a result, companies use their own internal standards and methodologies, which can vary significantly in efficacy. These company standards typically measure the performance of fire detector systems in terms of percentage coverage over a particular volume.

This may seem a reasonable metric but it misses the most important factor, namely the size of the gaps that the detectors do not cover. It is the size of the gaps in your system that is going to dictate whether or not your system is able to detect a fire of a size that may lead to escalation. A fire area could have a very high percentage coverage but still have gaps where a significant fire could exist.

This paper aims to show the deficiencies in measuring detector coverage based on percentage coverage alone and presents the advantages of alternative methods, such as optimising your system to ensure that no fire above a certain size can go undetected. The work presented within this paper uses MMI's in-house fire detection code which uses ray casting techniques in a fully three-dimensional manner to account for obstructions that block a detector's line-of-sight.

19. Cybersecurity - What should Safety Instrumented System integrators be doing?

Thurs 9.30 – 10.10: Seminar room



Chris Parr - Technical Authority for Functional Safety, Sella Controls

Chris Parr is a Functional Safety Specialist and EC&I Engineer with over 22 years' experience in the specification, design modification and maintenance of process control and safety instrumented systems across multiple industry sectors.

Chris is a TÜV Rheinland certified functional safety expert (FS-Expert, SIS, ID:260/15) and Chartered Engineer and is currently the Technical Director for SELLA CONTROLS, a supplier of safety critical control systems to the Oil & Gas, Rail and Petrochemical industries. Chris leads the company's functional safety consultancy business and is an approved SIL study facilitator and functional safety assessor for a number of organisations.

In addition, he is a director of CASS (Conformity Assessment of Safety-related System), a UKAS accredited Functional Safety Management assessment scheme.

There is increasing momentum in the process industries to address cyber security risks associated with Industrial Automation and Control systems (IACS) and the publication of the UK Health and Safety Executive Operational guidance (OG-0086) on the subject matter is likely to see this focus increase.

Safety Instrumented Systems (SIS) are recognised as a primary protective layer for many Oil and Gas and Petrochemical facilities. Whilst the specification, design techniques and assessment of the integrity of these systems is well understood through industry guidance and standards such as BS EN 61508 and BS EN 61511, best practise for protecting these systems from security threats throughout their lifecycle is less clear. However, it does appear that IEC 62443 "Security for industrial automation and control systems" will become the de-facto guidance and is referenced in both BS EN 61511 and the HSE's operational guidance.

System Integrators play a key role in the design, modification and maintenance of Basic Plant Control Systems and Safety Instrumented Systems and in the majority of projects they provide turnkey solutions for the control and automation aspects of the project to the end users. This raises the question of how these system integrators handle security issues and if their practices and procedures sufficiently reduce security vulnerabilities in the design, operation and maintenance phases of the lifecycle.

IEC 62443 part 2-4 covers the security program requirements for IACS service providers. It gives specific requirements of what a system integrators management system should include to give confidence to asset owners that the integration and maintenance activities that they complete include appropriate security measures. The standard covers subjects such as staffing, solution hardening, network security, user security and patch management.

This presentation will introduce Part 2-4 of IEC 62443 and explain why compliance is good for both the system integrator and their clients. It will also draw on the presenter's own experience of applying the standard in a safety systems integrator environment and highlight the challenges and opportunities faced.

20. When safety meets security - Combining the best of both worlds

Thurs 10.15 – 10.55: Seminar room



Rob Turner - Advanced Solutions Consultant, Yokogawa

Rob is the Team Lead for Yokogawa's Advanced Solutions group in the UK and a practising consultant in industrial cyber security. In a career spanning over 35 years Rob has been actively engaged as both an engineer and a technical consultant in control, automation and industrial IT.

He has been involved in industrial network security since before it became a major issue and is currently engaged in gap assessments and improvement planning for clients in numerous industry sectors. At the beginning of 2017, he became a qualified Global Industrial Cyber Security Professional (aka GICSP) through the SANS Institute.

Earlier, he was lead engineer with Wormald/Tyco designing, installing and commissioning safety systems in the oil and gas industry, worked in the nuclear sector at Sellafield and Heysham II, and was a design engineer for control systems and PLC programming at Honeywell.

The latest edition of IEC 61511-1 "Functional Safety – Safety Instrumented Systems for the Process Industry Sector" requires that the existing risk assessment process for a safety instrumented system should also now include an assessment of cyber security vulnerabilities.

At first sight this might appear to be an additional burden for the process industries and an intrusion into the jurisdiction of IEC 62443 which already covers the security of these systems. And yet these two standards might not be so far apart in their approach.

This presentation explores:

- 1) The need for a tie between safety and security for industrial control systems, and safety instrumented systems in particular.
- 2) The areas of common ground between IEC 61511 (functional safety) and IEC 62443 (industrial cyber security).
- 3) How to potentially combine the best of both standards and achieve a control network that is safely secure, and securely safe.

21. Are luminaires causing hidden risks in Ex Areas because of LEDs?

Thurs 11.30 – 12.10: Seminar room



Tarmo Rintala - Technology Manager, Atexor Oy

Tarmo Rintala is Senior Manager, Technology at Atexor Oy in Finland, the EX lighting specialist. He was formerly responsible for Standards and Directives and earlier for Marketing and Sales activities at Centaurea Oy.

The potential risks of high-powered LED luminaires have been known for years. Those risks are growing as LEDs get more and more powerful. It is equally clear that the interpretation of the standards meant to ensure the safety of these luminaires has been anything but consistent.

In September 2016, at the IECEx meeting at Umhlanga, South Africa, the chairman of the Ex Technical Advisory Group (ExTAG), Professor Xu Jianping, presented the issues regarding LEDs and the possible ignition sources caused by powerful light.

The main message is clear: There are too many different interpretations of the standards, and this is resulting in compromises on safety.

The number of LED luminaires for applications where flammable vapours and particles are present is increasing rapidly. The risk of ignition may be significant if the optical radiation has not been accounted for in the design of the luminaires.

When selecting equipment for areas with possible risk of explosion, due care must be taken. All companies do not necessarily have experts qualified to understand the differences in the safety of products. Often the purchaser is just checking that the Ex certification exists, and not digging into the details of what that certification actually covers. The person responsible for selecting and accepting products must be able to trust the certification and other information on a product.

The problems with current practices are systemic, and they are leading us to a situation where Ex classified sites have an increasing number of LED luminaires which may not be safe to use at the site.

Thanks to Professor Xu Jianping, the issue of optical radiation is properly out in the open. This is huge step, but still only the first in actually ensuring the safety of high-tech lighting systems.

22. Coldflow in cables – Some practical advice

Thurs 12.15 – 12.55: Seminar room



Dr Geof Mood - Technical Director, CCG Cable Terminations Ltd

Geof has spent over 40 years in engineering research work, product development and manufacturing, leading to his current position as Technical Director for CCG Cable Terminations Ltd. More than half of his career has involved product certification to various standards and for the last 11 years he has specialised in the development and certification of high quality cable glands and accessories for use in industrial and hazardous areas.

Geof has been involved in the development of product standards for over 35 years and is currently an active member of a number of national and international standards committees which he attends as a cable gland expert.

The subject of coldflow in cables is poorly understood and this has led to widespread confusion amongst designers, specifiers and installers, particularly in the selection of suitable cable glands to use with affected cable in Ex applications. BS EN / IEC 60079-14 states that the installer should 'select cable glands to reduce the effects of coldflow characteristics of cable'. However it fails to define what is or is not cable with coldflow characteristics or how it is possible to reduce the effects of coldflow, and if possible how much reduction is needed. This has given some cable gland manufacturers the opportunity to make exaggerated claims for their products and to create an atmosphere of fear amongst specifiers and installers, having them believe that coldflow in cables is a risk in applications where it is not.

Lack of understanding of what coldflow is has also led to a number of installations being carried out with inappropriate cable glands, leading to a need for costly refits in some cases. There is also the very real risk of installations being unsafe, despite the installer following the guidance of BS EN / IEC 60079-14 and using the assurances of the cable gland manufacturer.

This paper will debunk a number of common myths. It provides some practical guidance about what coldflow really is and shows a simple and cheap test method to determine if cables are affected by it. It will also provide straightforward advice about how to eliminate the effects of coldflow and achieve a safe installation if the cable being used is at risk of coldflow. The advice is strictly in compliance with BS EN / IEC 60079-14 and will lead to safer, and in many cases also cheaper, installations.

23. How to prevent electrostatic charging of processing equipment situated in ATEX atmospheres

Thurs 14.00 – 14.40: Seminar room



Mike O'Brien, Managing Director, Newson Gale

Mike O'Brien is Managing Director for Newson Gale's market-leading range of static grounding and bonding equipment. He has written numerous published articles on the subject of static electricity and its relevance to the hazardous process industries.

Mike holds an honours degree in Mechanical Engineering from the University of Limerick, an MBA from the Bradford School of Management and is a Chartered Marketer with the Chartered Institute of Marketing.

This presentation will:

- Outline why static electricity is an ignition risk in the chemical industry.
- Provide case studies and analysis of incidents resulting from the ignition of flammable atmospheres due to discharges of static electricity.
- Describe what measures electrical equipment specifiers, production managers and QHSE managers can take to eliminate the ignition risks of static electricity.
- Correlate these measures with the guidance stipulated in IEC 60079-32-1: "Explosive atmospheres - Part 32-1: Electrostatic hazards - Guidance".
- Present novel ways of grounding multiple components at risk of electrostatic charge accumulation

24. How to improve performance, reduce risk and achieve sustainable growth in areas with explosive atmospheres

Thurs 14.45 – 15.25: Seminar room



Sarra Cheyne – British Standards Institution (BSI)

Sarra Cheyne is a Standards Programme Manager at BSI, managing the Explosive Atmospheres standards portfolio and is secretary to the UK Ex committees. Before joining BSI, she was a civil servant for 11 years at the Department for Education and at the former Department of Energy and Climate Change.

Risk management and assessment is necessary across many business processes, not just areas such as health and safety. Guidance and standards can help avoid a potentially explosive scenario.

This presentation will show how a business can reassure shareholders, customers and employees that by managing risks it is being effectively run and confirm its compliance with corporate governance requirements.



25. ABB Workshops - Is Your DSEAR Documentation Up to Date?

Weds Feb 28: 14.00 - Aston Room

Thurs Mar 1: 11.00 - Aston Room

Leaders: Peter Hodgson and Alison McKay

The Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) require that all processes involving significant quantities of flammable materials maintain an up to date set of documentation demonstrating how the risks associated with these materials are controlled. This includes a risk assessment, showing that the hierarchy of control has been applied, and an area classification, driving control of ignition sources where a residual risk may be present. Records must also be kept of equipment – both electrical and non-electrical – installed in these areas, including details of inspections. Many operating companies are finding that when required to demonstrate compliance, they are unable to provide satisfactory documentation to show that the stipulations of DSEAR are being met; or, their documentation is found to be not current, casting doubt on whether the risks are truly controlled.

In this workshop, Safety Consultants Peter Hodgson and Alison McKay will discuss the required documentation to demonstrate compliance with DSEAR, how to ensure that adequate risk assessments are in place demonstrating the application of the hierarchy of control, and how to keep the area classification up to date with current standards and guidance. Strategies for establishing programmes for periodic review of the documentation set will be explored, and best practice shared.

EXHIBITION CONTACTS

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Anamet Europe BV (Stand 9)

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ATEXOR OY (Stand 15)

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BEKA associates Ltd (Stand 25)

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BSI Group (Stand 1)

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C&P Engineering Services Ltd (Stand 14)

Gorseinon Road
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Tel: +44 (0)1792 222501
Email: info@cpengineering.co.uk
Web: www.cpeengineering.co.uk

CCG Group (Stand 11)

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Web: www.ccgcablegland.co.za

COGENT Skills (Table Top)

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DEKRA Process Safety (Stand 3)

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Web: www.draeger.com

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Hornbill Engineering & Training (Stand 5)

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Intertek Testing & Certification Ltd (Stand 16)

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Newson Gale Ltd (Table Top)

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Web: www.newson-gale.co.uk

PEI-Genesis (Stand 7)

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R Stahl Ltd (Stand 31)

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RAS Ltd (Stand 28)

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Rheintacho UK Ltd (Stand 23)

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**Roxby Training & FES (UK) Ltd
(Stand 29)**

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Tempa Pano UK Ltd (Table Top)

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**TVC Functional Safety Services
(Table Top)**

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Web: www.tinovc.com

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NOTES





NOTES



NAME:

COMPANY:

1. Are you a:							
Delegate		Chairman / Speaker		Event Sponsor / Partner		Invited Guest	

2. How did you hear about this year's Conference?											
Hazardex Magazine		Hazardex Website		By Email		Direct Mail Shot		Word-of- Mouth		Partner / Exhibitor	

Other

3. How did you rate the event overall?									
Excellent		Very Good		Good		Average		Poor	

4. In your opinion, what were the top three presentations in terms of usefulness?


5. What did you consider to be the high point(s) or low point(s) of the event in general?

Hazardex 2018

- Are there any topics that you feel would need to be updated or expanded upon next year? _____
- Are there any new topics you'd like to see covered next year? _____
- In your opinion, how else can we improve the Event? _____
- In your opinion, should the event move geographical location regularly – and if so where would you like it to be i.e. Other European, Middle East or World Location _____
- Would you object to any of your comments being published in Hazardex The Journal? YES / NO
- Would you prefer to receive the conference notes in electronic format rather than hard copy? YES / NO

Thank you for taking the time to complete this form.

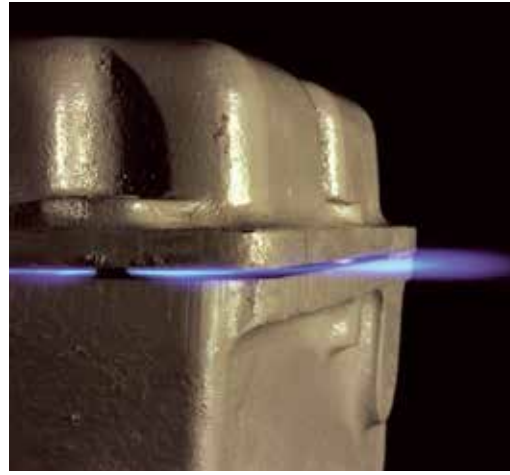
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