

# 2<sup>ND</sup> SAFETY CONTROL SYSTEMS AND HAZARDOUS AREAS CONFERENCE

## Workshop Presenters:

**DR. ERIC SHARPF**  
Partner – Exida Asia Pacific  
Certified Functional Safety Expert  
(CFSE)



**NEIL DENNIS**  
Technical Director – AECOM  
Chair of Standards Australia  
committee EL-014 for equipment  
and installations in hazardous areas



## BENEFITS OF ATTENDING:

- Hear about the recent revisions to IEC 61511
- Discover how IEC functional safety standards are being successfully applied to manage safety projects
- Learn about the lifecycle approach to safety-instrumented systems through case studies and critical discussion
- Update your knowledge on safety technologies for process and machinery safety
- Learn how to design and install safe working systems in hazardous areas
- See how New Zealand and international standards are being successfully applied
- Learn about the hazardous areas equipment installations
- Discuss critical issues of compliance to standards with experienced professionals
- Find practical solutions to your hazardous safety problems
- Network with experienced safety experts and your peers

## WHO SHOULD ATTEND:

- Instrumentation and Control Engineers
- Engineering Managers
- Process Plant Engineers and Technicians
- Plant Managers and Project Managers
- Process Maintenance Technicians
- Risk Assessors
- Chemical, Process and Mechanical Engineers
- Instrumentation Technicians
- Design Engineers
- Manufacturers of Hazardous Areas Equipment
- Safety Facilitators
- Electrical Technicians and Managers
- Process Control Specialists
- Process Safety and Loss Prevention Managers
- Government Safety Regulators/ Inspectors
- OHS/Training Managers
- Tradespersons working in potentially explosive areas
- Electrical and Instrument Tradespersons

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**22<sup>nd</sup> and 23<sup>rd</sup>  
August 2017**

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## 2<sup>nd</sup> Safety Control Systems & Hazardous Areas Conference



Every year, industry experiences catastrophic fires, explosions or toxic releases. These events can result in injury, loss of life and can have a huge economic impact. This conference has been created to offer you the most up to date information to enable you to analyse, specify, design, install and maintain safety systems and electrical equipment in your plant whilst complying with the latest standard requirements.

Many industrial processes have the potential to harm people or the environment. Day one of the conference will focus on safety control systems including instrumentation and machinery safety. Case studies and practical applications will be presented by specialists experienced in safety life cycle activities such as hazard and risk assessment and the determination of safety integrity levels (SILs). It will discuss the latest technology and application of safety-related control and instrumentation systems and will examine the complex and challenging issues of

using control systems technology to maintain and improve the safety of people and the plant whilst ensuring profitability.

Day two of the conference has been created to meet and exchange ideas for those concerned with the safe use of electrical and mechanical equipment and instrumentation in hazardous, flammable or explosive atmospheres. It will serve to highlight technologies, best practices, and accelerate improvements in standards and regulations to reduce explosions and fires caused by ignition of flammable vapours or dust clouds. Throughout these sessions participants have the opportunity to share experiences and know-how with engineers, technicians and other technical professionals who are all eager to eliminate accidents and injuries in the work place. This conference will be relevant and beneficial to a wide range of industry sectors including machinery and automation plants, chemical processes, energy and power, pulp and paper and petrochemicals.

### CONFERENCE DAY 1 – Safety Control Systems – 22<sup>nd</sup> August 2017

8.00am	<b>Registration</b>		
8.20am	<b>Opening Address</b>		
8.30am	<b>MORNING WORKSHOP</b>		
<b>Session 1</b>	<b>Includes Morning Tea</b>		
<b>WORK SHOP</b>	<b>Third Generation Functional Safety in a High Stakes World</b>		
	<b>Dr. Eric Sharp</b> – Partner, Exida Asia Pacific		
	It is now more than 20 years since the first functional safety standards were developed in the US and Europe. We have been through the initial generation when the 61508 first edition dominated (1996 to 2004) and the second generation when the process industry fully engaged with 61511 (2004 to 2016). Now a third generation has started with a new 61511 coming onto the scene with a new Health and Safety at Work Act. We also are faced with new issues of cyber security and alarm management integration, where the chances and consequences of failure continue to escalate. As always, our job is to work through the complexities and plan a clear, intelligent course forward. Charting and implementing that course will be our focus as we look at how to best apply the new elements of the process safety lifecycle, how to guard against new cyber security threats, and how to integrate alarm management all in the context of the new legal requirements. This workshop will be useful to engineers, technicians, and managers with design, safety, or operations responsibility in process or machine automation applications.		
	<b>Lunch – 12.30pm</b>		
1.30pm	<b>Functional Safety Assessment Stage 3 - in Practice</b>		
<b>Session 2</b>	<b>Arsham Ahmadi</b> – Functional Safety Engineer, HIMA Australia		
	Based on AS 61511.1.5.2.6.1.3 the assessment stages have to be identified during safety planning phase. AS 61511.1.5.2.6.1.4 calls for assessment Stage-3 as a minimum. Functional Safety Assessment plays a vital role in achieving the desired safety integrity of the safety systems. This paper will focus on the areas that could be overlooked during the risk analysis, design, installation, commissioning and modifications of a SIS and discuss how the assessment can reveal the possible errors. This paper will also attempt to clarify the concept of some commonly used terms such as verification vs validation or auditing vs. assessment and will highlight the key factors which must be met during the assessment (specifically Stage-3).		
2.15pm	<b>Controlling Fire and Explosion Safety using CCTV Technology</b>		
<b>Session 3</b>	<b>Dr. Frank Mendham</b> – Director, Blackie Mendham		
	Significant fires and explosions continue to occur in underground mines. Recent incidents in Turkey, China, the USA and New Zealand highlight the significant fire life safety and asset losses that can eventuate from dust explosions or large conveyor belt fires. Recent research has found that Video Based Fire Detection (VBFD) offers considerably faster response to visible smoke plumes than other forms of fire detection currently used in underground coalmines. The results of this research have provided a better understanding of how an increased amount of time can be achieved for underground mine workers to evacuate mines prior to the onset of untenable conditions. Additionally, improved asset loss control for underground mining is achievable.		
	<b>Afternoon Tea – 3.00pm</b>		
3.30pm	<b>IEC 61508 and IEC 61511 - An Overview</b>		
<b>Session 4</b>	<b>John Belgrave</b> – Senior Associate – Electrical and Instrumentation Engineer, Beca Ltd		
	This paper will provide a brief overview of the history leading to the development of IEC 61508 and sector specific standards such as IEC 61511, followed by a more detailed focus on the relationship between IEC 61508 and IEC 61511. Application of these standards within existing plants – brownfield projects – and conflicting regulatory regimes will then be explored. The author will illustrate these applications based on his international experience, primarily within the offshore Oil & Gas sector. These examples will also touch on the design principles and redundancy methods adopted to minimise cost, while also achieving the required SIL targets.		
4.15pm	<b>Practical Cyber Security for Safety Instrumented Systems</b>		
<b>Session 5</b>	<b>Peter Jackson</b> – Senior Systems Engineer, Engineering Control Limited		
	Included in the new revision of IEC 61511 are requirements to identify security threats and provide reliance against identified security risks. This paper will outline practical techniques in accordance with best practice to ensure that the safety instrumented system will function effectively in spite of increased risk in the 21st century. Air-gaps and firewalls only provide limited protection. An intentionally or unintentionally comprised SIS could result in reduced process safety protection, or worse still, initiate unsafe or unstable process conditions, as recent ICS security incidents have shown. Functional safety and cyber security can work together to improve plant safety only when security risks are considered and controls are implemented and managed effectively.		
	<b>Closing – 5.00pm</b>		
	<b>Networking Session – 5.00pm to 6.00pm</b>		
	An hour dedicated for all attendees to meet and socialise with experts and industry peers at the 2 <sup>nd</sup> Safety Control Systems and Hazardous Areas Conference Cocktail Hour.		

All conference papers are reviewed and selected for their high quality and technical value by our panel of specialists experienced in the theory and practice of safety control systems and hazardous areas.

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## CONFERENCE DAY 2 – Hazardous Areas – 23<sup>rd</sup> August 2017

### 8.30am **MORNING WORKSHOP**

**Session 6** Includes Morning Tea

#### WORKSHOP

#### Current and Future Directions for Hazardous Area Standards

**Neil Dennis** – Technical Director, AECOM Australia

Since 2013 there have been a number of significant new changes in the IEC end user standards for hazardous areas which are still filtering down into the ANZ standards. But the changes haven't stopped coming and more is on the way in both arenas. These changes include classification of hazardous areas, electrical installations and inspections, certification of assemblies, pressurisation and ventilation systems for rooms, safety devices, spray booths, adverse environments, competencies and more.

This presentation will give an insight into what is happening ranging from an overview and into some of the key technical details as well as providing a forecast of what can be expected in standards for hazardous areas over the next few years.



### Lunch – 12.30pm

### 1.30pm **Explosive Gas Hazardous Area Classifications using Computational Fluid Dynamic Modelling**

**Session 7** **David Pugh** – Senior Electrical Engineer, Beca

At a Chlor-Alkali Plant producing hydrogen gas, the existing hazardous area classification was thought to be overly conservative and encompassed non-Ex protected equipment. A numerical technique called computational fluid dynamics (CFD) was used to simulate the dispersion of hydrogen inside the plant building. This allowed engineers to visualise hydrogen concentrations within the building, more accurately define the hazardous areas, and make better decisions about where to install specialist Ex equipment. The savings to the plant owner has been estimated in the range of NZD 350-500,000. This paper presents the process undertaken to develop the CFD model, and the results.

### 2.15pm **High Definition Laser Scanning For the Cost Effective Development of Hazardous Area Drawings**

**Session 8** **Andy Gunson** – Specialist Engineer, GXsim Limited

#### CASE STUDY

Engineers working in hazardous areas often come across older plant and equipment where the original drawing information has either been lost, not kept up to date, or was never created. The task of generating drawings from scratch can often be overwhelming in terms of cost and time. In this case study, scanning and optical technology have been applied to complex plant (compact spray dryer) to generate three dimensional point clouds data and true view images. Both two dimensional and three dimensional drawings can be generate with relative ease. The end result is a cost efficient, clear pictorial and interactive communication of hazardous areas.

### Afternoon Tea – 3.00pm

### 3.30pm **Static Electricity – “The Front Line”**

**Session 9** **Mike Barker** – Market Manager Control & Defence, Electropar New Zealand

Static electricity is responsible for at least two serious fires or explosions in industry worldwide every day, according to the National Fire Protection Association (NFPA) and the U.K.'s Institution of Chemical Engineers. The misdiagnosis and misunderstanding of static electricity in a hazardous area poses a significant risk to plant, personnel and equipment. Electricians are often forming the “Front Line” responding to issues relating to static electricity. How can we better assist electricians with diagnosis, solutions, design and specification?

### 4.15pm **The Development of a Software System for Hazardous Area Documentation – Challenges, Pitfalls and Positive Spin-offs**

**Session 10** **Gustav Scholtz** – Managing Director, GRS Consulting Engineers Limited

Prescriptive safety system regimes, whether it be hazardous areas, safety instrumented systems, pharmaceutical validation or machine safety; are difficult to comply with fully and maintain, let's be honest, sometimes impossible.

The task of maintaining these systems will probably fail without a systematic and tailored approach.

This paper discusses the development of a software system for hazardous area projects and documentation, and the challenges and lessons learn along the way. The positive spin-offs from a systematic approach to hazardous area documentation for project and plant management will also be discussed.

### Closing – 5.00pm



### Sponsorship Opportunities

Representing your business at the 2nd Safety Control Systems and Hazardous Areas Conference in 2017 will provide you the opportunity to reach key decision makers from a multitude of industries.

For more information on sponsorship and exhibition opportunities please contact Joseph Madeley via email [conferences@idc-online.com](mailto:conferences@idc-online.com)

# WORKSHOP PRESENTERS

## DR. ERIC SCHARPF

Partner – Exida Asia Pacific, Safety Control Systems Expert

Dr. Scharpf has over twenty-five years of professional experience and is widely recognised as an expert in chemical process safety, efficiency analysis, and optimisation. He helped start up exida, an international automation system safety, security, and availability company. As a Principal Partner at exida, he has led and audited many safety lifecycle projects in chemical processing, energy, mining, and machine automation applications from analysis to operations. He has published numerous reviewed journal articles and patents as well as two leading textbooks on SIL target selection. He also has developed several of the cryogenic gas processing, combustion, and separation techniques used for hydrogen, synthesis gas, and power generation. His current work centres on independent functional safety assessment and risk analysis with a focus on achieving both cost and safety improvements. With significant experience in research and development, Dr. Scharpf also teaches a process energy optimisation paper at the University of Otago in Dunedin, New Zealand.



## NEIL DENNIS

Technical Director – AECOM Australia, Chair of Standards Australia committee EL-014 for equipment and installations in hazardous areas

Neil Dennis is a technical director and principal electrical/mechanical engineer with AECOM Australia. He has over 30 years experience in working in hazardous areas including design for complex plants of all types, compliance assessments, incident investigations, training, and specialist advice related to safety, risk analysis and regulatory issues. Neil currently holds positions on Australian and New Zealand joint standards committees including: Chairman of EL 14, Hazardous areas main committee; Deputy Chairman of MS 11, Classification of hazardous areas; Chairman of EL14/7, electrical installations and maintenance in hazardous areas and is a member of EL14/10, mechanical equipment for hazardous areas. Neil also represents Australia on relevant International Electrotechnical Committee, (IEC), working groups and maintenance teams in the development of new standards related to hazardous areas. He has played a lead role in drafting of recent standards and is active in many of the new developments for hazardous areas.



### REGISTRATION FORM:

## 2<sup>ND</sup> SAFETY CONTROL SYSTEMS & HAZARDOUS AREAS CONFERENCE

22<sup>nd</sup> & 23<sup>rd</sup> August 2017 – Novotel Auckland Ellerslie

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### 3. REGISTRATION & PAYMENT DETAILS

Prices shown are inclusive of GST

**PLEASE NOTE: Full payment is required prior to the commencement of the conference.**

#### 2<sup>ND</sup> SAFETY CONTROL SYSTEMS & HAZARDOUS AREAS CONFERENCE – 22<sup>ND</sup> & 23<sup>RD</sup> AUGUST 2017

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**OPTION 2: Standard Rate (NO Early Bird Discount)**  
 – Book after 25<sup>th</sup> July \$1725.00 x \_\_\_\_\_ delegates = \$ \_\_\_\_\_

**OPTION 3: 3 for 2 Offer AND Early Bird Discount**  
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**OPTION 4: 3 for 2 Offer Standard Rate (NO Early Bird)**  
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## GENERAL INFORMATION

### Confirmation Details

A confirmation email and invoice will be sent to delegates within 3 days of receiving the registration.

### Cancellation Policy

A fee of 20% cancellation will apply for cancellations received 7 – 14 days prior to the start date of the conference. Cancellations received less than 7 days prior to the start date of the conference are not refundable, however substitutes are welcome.

### Venue

Novotel Auckland Ellerslie  
72-112 Green Ln E, Ellerslie,  
Auckland 1051, NEW ZEALAND  
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### Accommodation

The conference venue has accommodation available. Contact directly on +64 9-529 9090 and mention the conference when booking and receive the best room rate available.

### Food and Beverages

All lunches, morning and afternoon refreshments are included in the registration fee.

### Unable to Attend

If you are unable to attend the full conference program, contact us for details to attend individual sessions, or to purchase the Conference Resource Kit.

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