# SAFETY CONTROL & INSTRUMENTATION SYSTEMS CONFERENCE

## - PRACTICAL IMPACTS OF IEC 61508 & NEW SAFETY TECHNOLOGIES

*Featuring:*

**Keynote Speakers**

**EDWARD MARSZAL (USA)**

PE, ISA84 Expert
President, Kenexis Consulting

**FRANK SCHREVER (AUS)**

Founder, Machine Safety by Design

*See back page for Keynote Speaker Bio's*

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## BENEFITS OF ATTENDING:

- Familiarise yourself with updates made to the IEC 61508 standard and consider the implications to your industry
- Discover how these 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 the latest trends and new developments in safety systems technology
- Update your knowledge on safety technologies for process and machinery safety
- Learn how to construct a clear safety requirements specification
- Find practical solutions to your safety problems
- Learn more about software tools available to assist your safety projects
- Discover how optimal safety design can improve production and reduce costs
- Network with experienced safety experts and your peers

## WHO SHOULD ATTEND:

The Safety Control Systems Conference is essential for anyone with responsibility for the safety of a hazardous process or machinery installation including:

- Electrical and Instrumentation Engineers
- Chemical Engineers and Process Control Specialists
- Process Safety and Loss Prevention Managers
- Plant Managers and Process Supervisors
- Environmental Protection Officers
- Government Safety Regulators/Inspectors
- Production Engineers
- Control System Integrators/DCS Software Engineers
- OHS and Environmental Risk Assessment Specialists

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## PERTH, AUSTRALIA

**20th, 21st & 22nd September 2011**

**The Mercure, Perth**

**20th September 2011**
**PRE-CONFERENCE WORKSHOPS:**

1. The Essentials of AS 4024.1-2006 Safety of Machinery
   Presented by Key Note Speaker Frank Schrever
2. Safety Integrity Level Selection
   Presented by Key Note Speaker Edward Marszal

*See back page for more details*

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# INTRODUCTION TO SAFETY CONTROL & INSTRUMENTATION SYSTEMS CONFERENCE

This conference will focus on the technology and application of safety-related control and instrumentation systems in the chemicals, energy, mining and manufacturing industries. In particular it will discuss the changes to the IEC 61508 standard and the implications this will have on your industry.

It 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.

Many industrial processes have the potential to harm people or the environment. Every year, industry experiences catastrophic fires, explosions or toxic releases. To avoid such incidents, extensive safety measures are employed, often involving the application of automatic safety alarms and high integrity safety control systems.

A "functional safety system" protects life and business assets. It must be accurately specified and designed for the task. Likewise, safety system practitioners must be aware of the best codes of practice, the best equipment to use and what pitfalls to avoid.

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). Topics will be relevant to a wide range of industry sectors including machinery and automation plants, chemical processes, energy and power, pulp and paper and petrochemicals.

## Conference Day One - 21st September 2011

**8.00am** **Registration**

**8.15am** **Opening Address**

**8.30am** **Managing Competency – Application to SIS Lifecycle Activities**

Session 1 — KEY NOTE

**Edward M. Marszal** – PE, ISA84 Expert, President, Kenexis

SEE BACK PAGE FOR EDWARD'S BIO

Functional safety management and specifically managing competency of individual performing SIS lifecycle activities, is an important and often overlooked part of compliance with the IEC 61511 / ISA 84.00.01 standard. While many "certification" schemes exist, "certification" only demonstrates the most basic knowledge of the fundamentals of the standards – far from a comprehensive assessment of competency. A much more proactive approach is required to ensure acceptable performance of safety lifecycle tasks. You will learn best practice in managing competency both in general, and also specifically applied to SIS engineering.

**9.30am** **Global Standard IEC 61508 Edition 2: Impact of Recent Changes**

Session 2

**Mario Dona** – Principal Engineer, Power & Controls, Santos Ltd

The seven parts of IEC 61508 Edition 2 have now been issued as AS 61508–2011. This paper will first trace the evolution of IEC 61508 Edition 2 and the subsequent publication of AS 61508–2011. Major changes made in the revision process will be reviewed, as will the current customisations of IEC 61508 and AS 61508, and their planned revisions. The major changes reviewed include; increased management requirements, impact of changes in terminology and modes of operation, changes to available compliance routes, changes to specification, software and security requirements, and the new requirements for a compliant safety manual.

**10.15am** **Morning Tea**

**10.45am** **SIL-Rated Fire (and Gas) Safety Functions – Fact or Fiction?**

Session 3

**Raymond Wright** – PhD, FSE Global Australia Pty Ltd

SIL-rated process safety functions are now commonplace and many users are specifying SIL-rated fire (and gas) safety functions. There are significant differences in the design and implementation of fire (and gas) safety functions – differences that can make it difficult to achieve even SIL 1 safety performance. You will learn about the differences and their impact on achieving safety performance. The implications of recommendations made in ISA TR84.00.07-2010: "Guidance on the Evaluation of Fire, Combustible Gas and Toxic Gas System Effectiveness" will be discussed. Finally, you will learn a method to manage fire and gas risk without the need for SIL-rated fire and gas safety functions.

**11.30am** **Independence of Safety Controls and their Integration With DCS**

Session 4

**Stanley Joseph** – Process Safety, Siemens

Integrated Control and Safety Systems offer many new opportunities, but also present additional challenges. The topic of ICSS is often hotly debated among safety professionals and users. Relevant IEC standards mandate separated protection layers for safety (SIS) and control systems (BPCS). You will learn what can be done to fit this requirement within an ICSS, what degree of integration is right for your project and what you should be aware of.

**12.15pm** **Lunch**

**1.15pm** **SIS Pitfalls, Major Accidents and Lessons Learned**

Session 5 — CASE STUDY

**Angel Casal** – CFSE, Risk Team Leader, Energy (Australia)

The oil and gas and (petro) chemical industry adopted the IEC 61511/08 Standards into operations from the date of publication. The speed and degree of integration has ranged widely, depending on the organisations' ability to understand the implications and apply corrective measures. After almost 10 years of application, several accidents have revealed that there are still serious systemic problems relating to a variety of subjects in the Lifecycle of Safety Instrumented Systems. This paper discusses the major pitfalls encountered in the implementation of the Functional Safety Standard. You will learn about how recent major accidents have highlighted the potential consequences of these pitfalls.

**2.00pm** **Risk Assessment - Key Issues Explored and Dissected**

Session 6 — KEY NOTE

**Frank Schrever** – Founder, Machine Safety by Design Pty Ltd

SEE BACK PAGE FOR FRANK'S BIO

Risk assessment is a key requirement in most companies and indeed in law, but it is often a very misunderstood process. The elements of risk assessment will be discussed from the point of view of risk control systems. We will go beyond the risk estimate, indicating how it must lead to an understanding of risk control so far as is reasonably practicable. Probability, the variable many people have difficulty with, will be dissected and discussed.

**3.00pm** **Afternoon Tea**

**3.30pm** **The National Harmonisation of Work Health Safety Laws – The Bottom Line**

Session 7

**Graham Dent** – Lawyer & Principal, Dent Consulting & Legal

Will the national "harmonisation" of OHS laws bring major change, requiring a significant refocus, or steady as you go with some "tinkering"? Graham, a lawyer, has over 30 years experience in OHS and has represented all industry sectors. This presentation will highlight the key issues including; where WA differs from the national legislation, the changes that will have a substantive impact and require close attention, what "due diligence" and the greater exposure to personal liability really mean, the response required, and the areas for priority in implementation processes.

**4.15pm** **Alarms and Safety Systems**

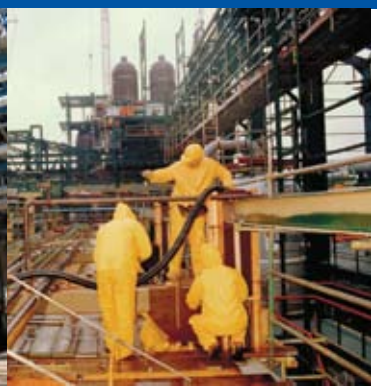
Session 8

**Calvin Trinh** – Senior Consultant, Operations Management, Honeywell Process Solutions

As an employer, irrespective of the size of the business, you have the responsibility for the day-to-day health, safety and welfare of your employees and visitors to your workplace. This duty of care is set out in the occupational health and safety (OHS) legislation of all Australian states and territories. Employers of process and other automated industries must provide a suitable alarm system that gives adequate warning of impending abnormal situations. Duty of care also includes the provision of a control system that does not put the operators under undue levels of stress. In this presentation you will learn about relevant alarm and safety system standards, using alarms as a method of risk reduction for your safety system and what steps you can take to improve your alarm systems. The potential effect on plant performance and the safety of plant personnel will be discussed.

**5.00pm** **Closing**



## Conference Day Two - 22nd September 2011

**8.30am** Session 9 **KEY NOTE**

### Update on Machinery Safety Standards

**Frank Schrever** – Founder, Machine Safety by Design Pty Ltd

There are now three key standards driving machine safety. In Australia, we have AS 4024.1-2006 with safety related control systems based on ISO 13849-99 together with 25 other standards. In addition we have IEC 62061 and EN-ISO 13849-2006. There is significant debate about the different approaches. The three standards and possible trends will be explored and you will learn how best to apply these to the safety related parts of your control systems.

**9.30am** Session 10 **CASE STUDY**

### Functional Safety for Machinery

**Craig Imrie** – Product Manager of Safety, NHP

With the increasing use of complex devices in safety systems and a transition towards functional safety in Europe, a better understanding of how to validate safety system to a SIL rating is needed. You will learn about the evolution of machinery safety standards in Europe and what this means for Australia as well as the technology limitations of the AS4024 category system. The differences and similarities between the safety process of AS4024 and AS62061 and why these standards are used in machinery safety will be discussed. You will walk away with an in depth explanation of the mechanics of designing a SIL rated safety system.

**10.15am** Morning Tea

**10.45am** Session 11 **CASE STUDY**

### Emerging Techniques in Risk Assessment in the Safety Lifecycle

**Linton Wales** – Instrumentation & Controls, Sinclair Knight Merz

This paper will present emerging risk assessment approaches in functional safety lifecycle including security threats and vulnerability analysis as required in the new issue of IEC 61508. The new layers of protection quantitative risk assessment technique will also be discussed. A case study will be presented to detail how security may be built in to the safety lifecycle. You will gain an understanding of available standards and certification. Finally a new IEC 62061 quantitative safety integrity level risk assessment techniques for a safety system application, will be outlined.

**11.30am** Session 12

### Understanding Verification & Validation of Software Under IEC 61508-3:2010

**Niroshan Rajadurai** – EMEA & ANZ

This presentation will serve as a reference for developers of systems that contain software which must be certified or follow a IEC 61508 conformant process. It will cover; software safety validation planning, software design and development, integration and testing, software safety validation, operation and modification, and software verification. You will take away a selection of techniques and measures that are relevant to software safety validation planning based on the safety integrity level. You will learn how to apply these techniques to reduce the cost and effort required to certify software to IEC 61508-3:2010.

**12.15pm** Lunch

**1.15pm** Session 13 **KEY NOTE**

### Bypassing Safety Instrumented Systems

**Edward M. Marszal** – PE, ISA84 Expert, President, Kenexis

Many process industry accidents occur, in part, due to safety instrumented systems (SIS) being bypassed at the time of the accident. While bypasses are often essential to testing and maintenance of SIS, their implementation must be properly engineered and controlled to prevent unacceptable increases in risk. You will learn best practices in the implementation of bypasses, but with minimising the risk. You will gain an understanding of the formal methods for managing the bypass process, within the context of an overall process management of change (MOC) process.

**2.00pm** Session 14 **CASE STUDY**

### Towards Systematic Integrity

**Mirek Generowicz** – Engineering Manager, I&E Systems Pty Ltd

Investigations into the Deepwater Horizon disaster found multiple systematic problems at all levels, across the many organisations involved. The international standards on functional safety IEC 61508 and 61511 have two main objectives; to manage risk of random hardware failures and to manage risk of systematic failures. Engineers usually find it relatively easy to understand and to calculate random hardware failure rates. It is significantly more difficult to embrace the management of systematic failures. This is about avoiding errors and failures due to the design, implementation and operation of the systems. It is just as important to achieve systematic integrity as it is to control probability of random hardware failures in safety instrumented systems. You will be guided in outlining a framework to manage systematic integrity in your organisation.

**2.45pm** Afternoon Tea

**3.15pm** Session 15

### Cyber Safety Instrumentation Systems, CSIS

**Dr. Halit Eren** – BEng, MEng, PhD, MBA

I&C networks in modern integrated industrial systems have a crucial role in maintaining safe plant operations. There are two major developments that are affecting instruments and instrumentation safety: 1) wide application of industrial Ethernet, and 2) use of digitised, intelligent instruments and sensors with embedded TCP/IP protocols. Communication traffic can prevent the plant from fulfilling its designated functions. The existing guidelines for addressing cyber-security are more oriented towards IT experts and thus difficult for engineers and other plant personnel to apply. How to prevent loss of plant capability and function will also be covered.

**4.00pm** Session 16

### Diagnostics for the Shutdown Valves

**Hun Koy Kung** – Process Management, Emerson

Partial Stroke Testing (PST) of a safety shutdown valve by digital valve controller has been widely adopted in recent years in the process industry. PST ensures that the valve is able to move on demand. It also detects some of the valve associated problems such as high torque/friction, valve integrity, stick-slip phenomenon. However, verifying a solenoid valve (SOV) movement during testing could be difficult. You will learn a method of using Digital Valve Controller to monitor the health of a SOV (mounted downstream pneumatically) in series with the Digital Valve Controller. The manual operation and the resetting of the ESD valves after tripping will be covered.

**4.45pm** Closing

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 functional safety systems and instrumentation.

# PRE-CONFERENCE WORKSHOPS - 20th September 2011

## WORKSHOP 1 8.30am - 12.30pm
### The Essentials of AS 4024.1-2006 Safety of Machinery

This workshop will cover what you must know for compliance with the law (including the forthcoming harmonised OH&S Act, regs and standards), with optimum productivity front and centre. We will cover the key requirements for machine safety from a design perspective and look at risk assessment leading to safe design, guarding principles and safety related parts of control systems. Interlocking and emergency stop design, unexpected startup and ergonomics will also be considered. The interaction of all of these elements and how to enhance productivity will be discussed

**Your presenter: FRANK SCHREVER** **Founder, Machine Safety by Design**

Frank has a Bachelor of Applied Science (Hons) from the University of Melbourne, Cert. IV in Training and Assessment and has over 32 years experience in the instrumentation and automation markets. He has managed a number of subsidiaries of multinational companies, establishing the Pilz subsidiary in Australia in 1998 and managing it for 12 years. He established Machine Safety by Design Pty Ltd in 2010 to specifically provide training and consulting services to the machine industry. Frank has been the IICA representative on the Australian standards committee for "Safety of Machinery" SF 041 reviewing AS 4024 and other machine specific standards. Frank has trained workcover inspectors in various states and presents at regular workshops on AS 4024.

## WORKSHOP 2 1.30pm - 5.30pm
### Safety Integrity Level Selection

This workshop will describe the fundamentals of Safety Integrity Level Selection, as summarized from Edward's award winning textbook, "Safety Integrity Level Selection – Systematic Methods including Layer of Protection Analysis". Safety integrity level selection is an exercise in risk analysis. You will be provided with an overview of how decisions about risk are made in general, and then focus those techniques upon the task of selecting SIL targets. The workshop will include reviews of consequence analysis methods and consider assessment tools – with a particular focus on layer of protection analysis. Examples and exercises based on a sample process production facility will be provided.

**Your presenter: EDWARD M. MARSZAL** **PE, ISA84 Expert, President, Kenexis**

Mr. Marszal is President and CEO of Kenexis. He is responsible for engineering consulting activities related to the implementation of instrumented safeguards for process industry plants. Edward received a B.S.Ch.E. from The Ohio State University in 1992 with emphasis on control systems and abnormal situation management. He is an ISA Fellow and former Director of the ISA Safety Division and the co-author of the award winning "Safety Integrity Level Selection" textbook from ISA. He is also a registered professional engineer in Ohio and Illinois and also an ISA certified ISA84 Expert.

# REGISTRATION FORM: Safety Control & Instrumentation Systems Conference 2011

Simply complete this registration form online or return by fax or email

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**EARLY BIRD OFFER:** 20% off the conference fee for registrations received before 26 August - SAVE $329

**AND/OR**

**3 FOR 2 OFFER:** Register 3 delegates and only pay for 2 - SAVE $1645

## 2. REGISTRATION & PAYMENT DETAILS

Prices shown are inclusive of GST

☐ **20 SEPTEMBER 2011 - Pre-Conference Workshops** *(NO discounts for pre-conference workshops)*

*Workshop 1:* **The Essentials of AS 4024.1-2006 Safety of Machinery**
Presented by: **FRANK SCHREVER** **$350** x _____ delegates = $ _____

*Workshop 2:* **Safety Integrity Level Selection**
**Presented by: EDWARD MARSZAL** **$350** x _____ delegates = $ _____

☐ **21 & 22 SEPTEMBER 2011 - SAFETY CONTROL & INSTRUMENTATION SYSTEMS CONFERENCE**

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☐ OPTION 2: **Early Bird Discount 20%** - Book before 26 Aug **(SAVE $329)** **$1316** x _____ delegates = $ _____

☐ OPTION 3: **3 for 2 Offer (SAVE $1645)** 3 x delegates **2 x $1645** = $ 3290

☐ OPTION 4: **Early Bird Discount AND 3 for 2 Offer (SAVE $2303)** 3 x delegates **2 x $1316** = $ 2632

**Additional delegates:** Corporate packages available upon request **TOTAL DUE = $** _____

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

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## GENERAL INFORMATION

### Confirmation Details
A confirmation email will be sent to all delegates approximately 10 days prior to the conference.

### Cancellation Policy
Full reimbursement will be accepted if written notification of cancellation is received by IDC Technologies on or before 1st September 2011. A fee of 20% will apply to any cancellations received between 2nd September and 9th September 2011. No cancellation requests can be accepted after 9th September 2011, however, substitute delegates are welcome.

### Venue
Mercure Hotel Perth
10 Irwin Street, Perth, 6000
Phone: (08) 9326 7000

### Accommodation
The conference venue has accommodation available. Contact directly on (08) 9326 7000 to make a booking and mention the SAFETY CONFERENCE to receive the special rate. For alternative local accommodation, contact IDC on 1300 138 522

### Food and Beverages
All lunches, morning and afternoon refreshments are included.

### 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.

### Enquiries
Phone: 1300 138 522

## REGISTRATIONS

We encourage you to register early, as spaces are limited. Your payment must accompany the registration form in order for it to be processed and confirmed.


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