SAFETY IN DESIGN CONFERENCE

Keynote Speaker:
FRANK SCHREVER
Chairman SF 041 Standards Committee for Safety of Machinery AS 4024 Series - Machine Safety by Design

WHAT YOU WILL GAIN FROM THIS EVENT:

- Understand broad approaches to mapping risk to reliability requirements
- Review previous accidents relating to safety in design and their impact on the current industry
- Understand the value of 3D modelling in safety in design
- Learn how to eliminate hazardous areas through pre-emptive design
- Gain a full understanding of legal requirements and legislation regarding correct safe design practices
- Explore the role of human factor integration in design projects
- Learn the most common hazards to consider in the design phase
- Address the essential steps required to perform an effective risk assessment
- Learn how bowtie analyses can benefit and simplify the design phase
- Hear discussions on methods adopted to mitigate vibration induced damage to structures
- Learn how to increase safety in the design phase of offshore oil and gas projects
- Illustrate challenges and opportunities experienced by industry professionals through their involvement with HAZOPs
- Gain a better understanding of design legal obligations and how to avoid liability for unsafe design

WHO SHOULD ATTEND:

- Architects
- Drafters
- Building Designers
- Engineers, Technologists and Technicians
- Interior Designers
- Industrial Designers
- Contractors
- Suppliers (including manufacturers, importers, plant-hire)
- Constructors/Supervisors
- Installers
- Trades/Maintenance Personnel
- Health and Safety Professionals
- Occupational Health and Safety Managers
- Systems Managers
- Risk Managers
- Chief Safety & Risk Engineers
- Safety Managers
- Engineering Managers
- Project Engineers
- Competencies & Risk Managers
- Environment Health & Safety Managers
- Risk Management & Staff
- Principal Risk Advisors & Consultants
- Risk Surveyors
- Health & Safety Managers/Advisors
- Design Managers
- Project Directors
- Construction Project Managers
- Human Resource Staff

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18th & 19th November 2015

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INTRODUCTION TO SAFETY IN DESIGN

This conference has been created to discuss the issues involved in Safety in Design (SiD) and aims to help reduce the number of safety incidents through pre-emptive design. The event will cover hazard identification and risk assessment methods early in the design process to eliminate or minimise safety risks. Eliminating hazards at the design stage is the smart way to operate and better than making changes later when the hazards become real risks in the workplace. Experienced speakers will focus on the principles of SiD to help designers think of ways to keep employees safer through well thought out design and will examine the critical issues involved in the management and planning of Safety in Design.

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 in design.

CONFERENCE DAY ONE – 18th November 2015

8.00am **Registration**

8.15am **Opening Address**

8.30am **Session 1** **KEY NOTE**

Linking Risk and Reliability – mapping the output of risk estimation tools to functional safety requirements for safety related control systems

Frank Schrever – Chairman SF 041 Standards Committee for Safety of Machinery AS 4024 Series – Machine Safety by Design

The increased focus on controls systems for risk reduction in machinery requires controls systems designers, and safety engineers, to have a much deeper understanding of the risks related to machinery, and the relationship between the required risk reduction and the reliability of the control systems used to protect users. Immediately following risk assessment, risk reduction measures are specified to effectively control significant risks. The linkage between the assessed risk and the required integrity (reliability) of the safety-related controls is fraught with confusion for many practitioners. This paper addresses this confusion by providing broad approaches to mapping risk to reliability requirements either directly, or by mapping the relevant risk parameters used to estimate the risk to those relevant to assignment of integrity requirements.

9.30am **Session 2**

Avoiding vibration induced failures

Peter Airey – Director – Airey Taylor

Structures which support mining equipment support equipment with large mass creating significant vibration. Provision of a structural form able to minimise vibration response is required to minimise risk to life and property. Structural response to dynamic loads at concept stage to ensure the structure has a low natural frequency compared to operational speed of machinery to avoid dynamic resonance is needed. Analysis of a "low tuned" structure under service load forcing frequencies is presented. Results predicted are compared with measurement of vibration in service. Methods adopted to mitigate vibration induced damage in a "low tuned" structure are discussed.

Morning Tea – 10.15am

10.45am **Session 3**

Avoiding electrical equipment in hazardous areas

Mirek Generowicz – Engineering Manager – I & E Systems

In minerals processing and mining industries people are not generally familiar with the requirements for electrical equipment in hazardous areas. It can be hard to achieve and maintain compliance to the standards. This paper presents the results of a recent review of hazardous areas at an iron ore mine site in the Pilbara region. The review demonstrated that the extent of the hazardous areas at the mine site could be reduced dramatically by eliminating hazards through pre-emptive design.

11.30am **Session 4**

The value of 3D for safety and design

Peter Versaci – Technical Manager – SF Design

Magnus Whitall – Technical Services Manager & Director – SF Design

Learn and discover how 3D models and the latest technology can be at the forefront of safety in design. We will share our experience in creating assembly instructions, assessing centre of gravity and lifting conditions, creating fabrication and installation manuals as well as interrogating the models to clearly visualise and predict what issues may occur, improves overall safety of our designs. 3-D parametric modelling enables us to have our core focus on design intent which includes safety, fabrication and use.

Lunch – 12.15pm

1.15pm **Session 5**

Past accident & incidents – do they influence SiD?

Raj Sreenevasan – Principal Instrument Engineer – Tetra Tech Proteus

A 2012 study analysed major equipment related chemical accidents and found that design errors contributed to more than 79% of the accidents. Similarly, studies of accidents and disasters in safety-critical systems, has found that design induced errors contributed to these accidents. Mines without people, and processing plants without human operators do not exist. It is accepted that humans err. True mistake proofing (safety-in-design) devices should be small, low-cost, simple, and directly integrate into various construction stages. A good mistake proofing device is one that requires no attention from the worker. If we accept that people make mistakes, then the next logical step to follow is to prevent the mistakes from leading to an incident – a la 'mistake-proofing' the system.

2.00pm **Session 6**

Human factors in design. What should we be doing?

Andrew Sutherland – Director – HF Integration Pty Ltd

The application of human factors engineering principles (HFE) to the design of safety critical equipment and systems is now a common and valued part of major engineering projects. Unfortunately, many projects adopt an "off the shelf" attitude to HFE, limiting its application to blunt application of a design standard. Others conduct HFE audits at the end of the design phase when the scope for influence on the project is greatly reduced. Today, HF specialists are more concerned with creating the conditions in the workplace that support safe and effective operations, and optimise the interactions between people, equipment and processes. This presentation explores the important role of human factors integration early in a project and reveals that modern approaches go beyond occupational health risk to tackle major accident hazards and production disruptions.

Afternoon Tea – 2.45pm

3.15pm **Session 7**

Safety in design from an engineering perspective

Aaron Murray – Director – BPA Engineering

In 2008 Worksafe Western Australia and the Western Australian Commission for Occupation Safety and Health developed and implemented a Code of Practice for the safe design of Buildings and Structures to provide guidelines for construction designers in meeting safe design regulations. The obligations on design professionals for safe construction design have been in the Western Australian Act since 1986. It is only since the Regulations and Code of practice were developed in in 2008 that regulators moved to enforce the legislation. This paper will look at the legislation and address its implications on the engineering profession. It will look at how engineering professionals deal with the different facets of the legislation in terms of their legal responsibilities as well as provide examples of design innovations and considerations that result in safe construction methodologies. It will also give examples of design considerations that could be considered unsafe to constructors and the future users of the building.

4.00pm **Session 8**

Challenges and opportunities of a HAZOP

Srinivas Shastri – Lead Process Engineer and Project Director – GHD

HAZOP has gained maturity as a Safety in Design Tool. With a history spanning a few decades, it is generally well understood and applied, particularly in the Oil and Gas industry. Other industries have seen the benefits of this technique and there are adaptions of this tool to their industry. Notwithstanding the vast experience available today, challenges and opportunities still remain. The paper will illustrate challenges and opportunities experienced by the author through his involvement with HAZOPs. It will also reiterate key errors and the importance of good facilitation.

Closing – 4.45pm

Networking Session – 5.00pm to 6.00pm

An hour dedicated for all attendees to meet and socialise with experts and industry peers at the Safety in Design Conference Cocktail Hour.



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CONFERENCE DAY TWO – 19th November 2015

8.30am **Session 9**

Machine safety control system design – comparing the methods in AS 4024 and AS 62061

Frank Schrever – Chairman SF 041 Standards Committee for Safety of Machinery AS 4024 Series – Machine Safety by Design

The key Australian standard for machine safety AS 4024.1 has recently been overhauled and now describes two methods for arriving at a safety control system design commensurate with the level of risk; Categories, and Performance levels. AS (IEC) 62061 "Functional safety of safety-related electrical, electronic and programmable electronic control systems" is the machine sector standard adapted from AS (IEC) 61508 which describes the SIL (Safety Integrity Level) approach to safety control system design. The methods will be examined and compared with a view to de-mystification, and the process for reaching a "grand unified standard" which is currently underway will be discussed.

9.15pm **Session 10**

Pool fire case study – evacuation analysis and safety in design

Richard Welsh – Managing Director – Complete Fire Design

A case study sample for integrated modelling of personnel evacuation with pool fire simulations to increase safety in the design phase of offshore oil and gas projects. This paper presents a sample case of the evacuation modelling integrated with pool fire studies in an offshore environmental. The integration of fire analysis inside the evacuation modelling would increase safety in design with designing more effective layouts with respect to escape ways, stairs and ladders. The pool fire is simulated through computational fluid dynamics method by means of "Fire Dynamic Simulator (FDS)" software and its results are integrated into escape and evacuation modelling established by means of "Pathfinder" software. The paper will discuss the results achieved by modelling different evacuation scenarios defined by pool fire impacts and how the integrated modelling will improve the escape and evacuation analysis and design.

Morning Tea – 10.00am

10.30am **Session 11**

The consultant's journey to safety in design

Sean Page – Director – ACOR MCE Consultants

Amanda Wylde – Senior Engineer – ACOR MCE Consultants

Safety in Design is more than just applying the standards and regulations prescriptively. As engineers and consultants we have a responsibility to ensure that our product is designed for its intended use. This requires thinking about safety in constructability, operation and maintenance of what we are designing. This paper will look at how an engineering consulting company has embraced Safety in Design and the journey.

11.15am **Session 12**

Centralising controls aids in bowtie simplification and assurance

Alex Apostolou – Director – Meercat

Jodi Goodall – Risk and Projects Manager – Incitec Pivot Limited

By virtue of their scenario-based frame of reference, there is a great deal of duplication within Bowties. Duplication of control nodes in particular across bowties, improves clarity and ensures completeness within each bowtie but creates complications in the Assurance process, an increasingly valuable spin-off from increased bowtie usage. This paper will discuss the key points of centralising actual and auditable controls into a common register and then linking those controls into every bowtie control node. This can deliver benefits like simplifying coverage assessment, control assurance and resource prioritisation, improve consistency and reduce the overall cost of assurance management.

Lunch – 12.00pm

1.00pm **Session 13**

Occupational health & safety issues in process plants

Damian Connelly – Director/Principal Consulting Engineer – METS Engineering

History shows us that process plants contain many risks for personnel who operate these plants. These risks include moving equipment, electrical, dust, noise and chemical exposure. Workplace health and safety statistics have shown a significant reduction in LTI's (lost time injuries) following the introduction of regulations for safe working places. There is a requirement for safety in design. Understanding this and the principles in safety in design includes eliminating hazards and controlling risks. The role of HAZOP and HAZID reviews and the role of Materials Safety Data Sheets are discussed.

This paper looks at the purpose, what designers must do and the hazards to consider including prevention and protection. A number of case studies are cited and the duty of care and harmonisation across the jurisdictions discussed as well as the role of Safe Work Australia.

1.45pm **Session 14**

How to do a good risk assessment

Daniela Tutman – Principal Engineer – Process Risk & Safety Management

In the third millennium, in a global village, in the teams where everyone speaks a different language and has a different cultural and engineering background, how do we do a good risk assessment to achieve safety in design? The strength and position of the modern risk facilitator depends on the aptitude of balancing the fine art of applying the risk assessment fundamentals, as well as embracing the transformation of a constantly expanding international project world. This presentation takes a glimpse at how the risk assessment process is evolving within the world of tomorrow and it aims to address the essential steps required to perform an effective risk assessment, whilst providing effective tools to embrace the challenges that could arise during facilitation of team-based workshops.

Afternoon Tea – 2.30pm

3.00pm **Session 15**

It is safe, and you can't get safer than safe: The legal obligation to design safely

Simon Billing – Partner – Corrs Chambers Westgarth

Tracy Caspersz – Counsel – Corrs Chambers Westgarth

WA has yet to adopt the model law contained in the Work Health and Safety Act 2011 (NSW). However, the Occupational Safety and Health Act 1984 (WA), imposes duties on designers in respect of plant used at a workplace. The Mines Safety and Inspection Act 1994 (WA) imposes similar duties in relation to plant used at a mine. Contract and the general law (negligence) and the law concerning misleading and deceptive conduct present further challenges for designers. This informative presentation will assist designers in gaining a better understanding of their legal obligations and how to avoid liability for unsafe design.

3.45pm **Session 16**

Safety in design, lessons learned

Jamshaid Mirza – Principal Consultant – Hendsa Technology

This paper provides real case study examples from the safety and functional safety projects that the author has led and completed for the oil, gas and petrochemical industries. The case studies were collected from a group of 'design basis evaluation' projects conducted by the author as an independent consultant to perform Safety Instrumented System (SIS) validation. The examples collected represent the stages of the safety lifecycle where the engineering companies, EPC contractors and the end-users tend to fail or ignore the importance of following and adhering to the safety life cycle guidelines.

Closing – 4.30pm

KEYNOTE SPEAKER

FRANK SCHREVER
Chairman SF 041 Standards Committee for Safety of Machinery AS 4024 Series – 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 36 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 before setting up his own training and consulting business, MSBD Pty Ltd. 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 since 1999; now chairman of this committee, and member of the ISO/IEC Joint Working Group for combining ISO 13849 and IEC 62061. Frank has trained workcover inspectors in various states; presents at regular workshops on AS 4024; prepared and presented the first safe automation course at Swinburne University, and has delivered guest lectures in the same subject at RMIT and a variety of other educational institutions.

REGISTRATION FORM:

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18th & 19th November 2015
Mercure Hotel, Perth, Australia

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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.

SAFETY IN DESIGN CONFERENCE - 18TH & 19TH NOVEMBER 2015

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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
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The conference venue has accommodation available. Contact directly on (08) 9326 7000 and mention the conference when booking and receive the best room rate available.

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