SAFETY CONTROL SYSTEMS
CONFERENCE 2010

WHO SHOULD ATTEND:

The Safety Control Systems Conference is essential for anyone with a 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
- Technologists & Technicians

VENUE:
The Executive Royal Inn,
Calgary

DISCOUNTS
EARLY BIRD OFFER!
20% OFF
BOOK BEFORE APRIL 9
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BENEFITS OF ATTENDING:

- Update your knowledge of safety technologies for process and machinery protection
- Learn about the life cycle approach to safety-instrumented systems through case studies and critical discussion
- Find practical solutions to your alarm problems
- See how IEC functional safety standards are being successfully applied to manage safety projects
- Learn about software tools to assist your safety projects
- Network with experienced safety experts and your peers
- See how optimal safety design can improve production and reduce costs

CONFERENCE:
12th & 13th May 2010

PRE-CONFERENCE WORKSHOPS:
11th May 2010

1. Everything You Ever Wanted to Know About Safety Systems, and then some
Presented by Paul Gruhn

2. Risk-Based Fire and Gas Detection and Suppression System Assessment
Presented by Edward Marszal

FOR MORE INFORMATION
Ph 1800 324 4244
idc@idc-online.com or www.idc-online.com

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INTRODUCTION TO SAFETY CONTROL SYSTEMS

Many industrial processes have the potential to harm people or the environment if something goes badly wrong. Every year, industry experiences catastrophic fires, explosions or toxic releases, but is always striving to avoid such incidents by providing extensive safety measures, often involving the application of automatic safety alarms and high integrity safety control systems.

A ‘functional safety system’ protects life and business assets through the actions it takes when a hazardous condition is present on a machine or in a process. This may be a safety trip switch on a conveyor or a critical safety alarm on a furnace or it may be a fully automatic shutdown system on a chemical or gas processing plant. However big or small, the safety system must be properly specified and designed for the task that it is required to do.

Safety system practitioners must therefore be aware of the best codes of practice, the best equipment to use and what pitfalls to avoid. Functional safety depends on getting everything right at all stages of the job, from defining the problem, finding the right solution to ensuring it is always maintained and tested.

This two-day forum with its experienced speakers will highlight and examine the critical issues involved in the application and management of functional safety systems. It will provide opportunities for participants to discuss their experiences and applications, and will cover cost effective and secure solutions to safety problems.

This conference presents an industry-wide forum to examine and discuss the latest international practices and standards in safety control systems. Case studies and practical applications will be presented by specialists experienced in safety life cycle activities such as a 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 1 - 12th May 2010

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Topic</th>
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<tbody>
<tr>
<td>8.00am</td>
<td>Registration</td>
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<tr>
<td>8.30am</td>
<td>Opening Address</td>
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<tr>
<td>Murray Macza - General Manager, ACM Facility Safety</td>
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<tr>
<td>8.45am</td>
<td>SIL Ratings for Fire &amp; Gas Systems - Are We Barking up the Wrong Tree?</td>
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<td>Paul Grunh - Training Manager, ICS Triplex</td>
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<tr>
<td>9.45am</td>
<td>The Fundamentals of LOPA and their Practical Implementation</td>
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<tr>
<td>Peter Scantlebury - Principal Consultant, FSE Global - Canada</td>
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<tr>
<td>10.30am</td>
<td>Morning Break</td>
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<tr>
<td>11.00am</td>
<td>Making the Most of Alarms as a Safety Layer of Protection</td>
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<td>Todd Stauffer - Director - Alarm Management Services, Exida</td>
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<tr>
<td>11.45am</td>
<td>A Cookbook of SIS Experiences and Tid-Bits in the execution of the Safety Requirements Specification (There's many a slip 'twixt crouch and leap)</td>
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<td>Simon Lucchini &amp; Stephen Johnson - Chief Controls Specialist &amp; Principal Process Specialist (Rijk), Fluor Canada Ltd</td>
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<tr>
<td>12.30pm</td>
<td>Lunch</td>
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<td>1.30pm</td>
<td>Users Need Detailed Reliability Analysis Not Just Numbers</td>
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<tr>
<td>Feng Tao - Project Engineer, Hinz</td>
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<tr>
<td>2.15pm</td>
<td>Fire Detector Coverage Mapping for Improving Existing Systems</td>
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<tr>
<td>Edward Marszal - Principal Engineer, Kenexis</td>
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<td>3.00pm</td>
<td>Afternoon Break</td>
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<td>3.30pm</td>
<td>Linking Business Operations with Safety Operations - in Real-Time</td>
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<tr>
<td>Murray Macza - General Manager, ACM Facility Safety</td>
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<tr>
<td>4.15pm</td>
<td>Safety Instrumented Systems: Why Not Take Advantage of SIL-Rated Fire Panels?</td>
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<tr>
<td>Foungnigue Coulibaly - Automation Engineer, Alberta Oilsands SAGD Project</td>
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<tr>
<td>5.00pm</td>
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**NOTE**

Users Need Detailed Reliability Analysis Not Just Numbers

Feng Tao - Project Engineer, Hinz

PD (Probability of Failure on Demand) verification is an important step in safety lifecycle, yet it has not received sufficient attention. Many engineers argue that due to uncertainties in equipment failure data, extra efforts spending on reliability calculation are actually waste of time, and they rely on commercial software to simply get reliability numbers, e.g. PFD and STR (Spurious Trip Rate). However, a detailed reliability analysis can provide more knowledge about the safety system. This presentation will attempt to answer why a detailed reliability (PFD) calculation is more preferred than a software generated report containing just numbers. Delegates will learn how simplified equations are derived, what assumptions are underlying and how to apply Markov model method to calculate PFD and STR.

**CASE STUDY**

Fire Detector Coverage Mapping for Improving Existing Systems

Edward Marszal - Principal Engineer, Kenexis

Recent development in the analysis of the performance of fire and gas detection and suppression systems are allowing the quantitative analysis of the coverage provided by arrays of detectors used to protect industrial facilities. These methodologies and the tools that support them were developed as a result of the release of the ISA Technical Report TR 84.00.07 - Guidance on the Evaluation of Fire, Combustible Gas, and Toxic Gas System Effectiveness. This paper presents a case study of the analysis of an existing fire detector system in the Gulf of Mexico. The analysis demonstrated that better coverage could be obtained using fewer detectors, allowing the design to be changed which can result in significantly lowering maintenance costs while improving safety.

### Contact Details

**REGISTER NOW:**

Fax: 1800 434 4045

Mail: IDC Technologies, Suite 402, 614 Richards Street, Vancouver, BC V6B 3A7

E-mail: idc@idc-online.com
As safety instrumented system design, in accordance with the IEC/ISA 61511 standard matures, best practices are evolving based on end users preferences, economy of presentation, ease of use for subsequent tasks, and lessons learned from unsuccessful early attempts. Items like P&G representation of safety functionality are still inconsistent across industry, and in some cases the results of poor documentation are excessive effort required in subsequent engineering and maintenance phases along with incomplete or improper designs. This paper collects industry experience and presents best practices for documentation and presents the rationale for the choices made. Items such as P&G representations, grouping of the functionality of multiple loops, and formatting for logic descriptions and test plans will be discussed and examples provided.

When it comes to safety, while the questions of ‘why’, ‘what’, ‘how’ and ‘when’ are fairly well answered with more or less accuracy only during the initial phases/gates of a project through attempts. Delegates will be given examples where the Functional Safety System Engineer may face challenges in applying inherent safety concepts and proper SIL determination methods to large-scale projects. A few examples are given to illustrate this. Upholding the principles of inherently safe design in the face of project pressure to reduce capital costs; SIL design that contains only functions with justifiable SIL requirements in the face of established and “rule of thumb” practices that include too much functionality. Delegates will be given examples where the Functional Safety System Engineer may face challenges in applying inherent safety concepts and proper SIL determination methods to large-scale projects. A few examples are given to illustrate this. Upholding the principles of inherently safe design in the face of project pressure to reduce capital costs; SIL design that contains only functions with justifiable SIL requirements in the face of established and “rule of thumb” practices that include too much functionality.

A Carrot-or-Stick Approach to the Economics of Safety

When it comes to safety, while the questions of ‘why’, ‘what’, ‘how’ and ‘when’ are fairly well addressed by standards or at least by best engineering practices, the question of ‘how much’ organizations need or are willing to spend to comply implement and maintain safety is answered with more or less accuracy only during the initial phases/gates of a project through the budgeting exercise. More often than not, and especially in the case of very large projects developed across many years, crucial safety life-cycle activities and up finding themselves strapped for resources. This paper looks at the typical gaps as seen by the authors practical attempts. Items like P&ID representation of safety functionality are still inconsistent across industry, and in some cases the results of poor documentation are excessive effort required in subsequent engineering and maintenance phases along with incomplete or improper designs. This paper collects industry experience and presents best practices for documentation and presents the rationale for the choices made. Items such as P&G representations, grouping of the functionality of multiple loops, and formatting for logic descriptions and test plans will be discussed and examples provided.
**Prices are exclusive of GST & HST**

**Kenexis Consulting**

**In order to authorise your card transaction, we require the last 3 digits:**

**REGISTRATION FORM:** Safety Control Systems Conference 2010

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

1. **DELEGATE DETAILS**

   **CONTACT:**

   **COMPANY NAME:**

   **COMPANY ADDRESS:**

   **CITY:**

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   **MR/MS:**

   **JOB TITLE:**

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   **EARLY BIRD OFFER:** 20% off the conference fee for registrations received before April 9th 2010

   **3 FOR 2 OFFER:** Register 3 delegates and only pay for 2 - Save $1500

2. **REGISTRATION & PAYMENT DETAILS**

   Prices are exclusive of GST & HST

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

   - [ ] 11TH MAY 2010 - Pre-Conference Workshops (NO discounts for pre-conference workshops)
     - Morning Workshop: Paul Gruhn - Everything you Ever Wanted to Know about Safety Systems
       - $300 x _____ delegates = $
     - Afternoon Workshop: Edward Marszal - Risk-Based Fire and Gas Detection
       - $300 x _____ delegates = $

   - [ ] 12TH & 13TH MAY 2010 - SAFETY CONTROL SYSTEMS CONFERENCE

   - [ ] OPTION 1: NO Early Bird Discount - Book after April 9th
     - $1500 x _____ delegates = $

   - [ ] OPTION 2: Early Bird Discount 20% - Book before April 9th (SAVE $300)
     - $1200 x _____ delegates = $

   - [ ] OPTION 3: 3 for 2 Offer (SAVE $1500)
     - $3000 x 3 delegates = $3000

   **Additional delegates:** Corporate packages available upon request

   - Add % GST (OR 13% HST) = $

   **TOTAL DUE =**

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**WORKSHOP 1  8.30am - 12.30pm**  
**Everything You Ever Wanted to Know About Safety Systems, and Then Some**

**Introduction:** What is a safety instrumented system? Knowledge gained from recent accidents (hindsight vs. foresight), Applicable standards, guidelines, recommended practices, and legislation

**Philosophy of Design for Safety:** The safety life cycle; safety control vs. process control and the “separation” issue; independent protection layers; assessing process risk (frequency & severity) and determining Safety Integrity Levels (qualitative and quantitative techniques, including exercises)

**System Implementation Issues:** Failure rates and modes; safe failure fraction and minimum hardware fault tolerance requirements; the real impact of redundancy (single, dual, triple); safety requirements specification; relay systems (including modeling exercises); software based systems (PLC, TMR, 1oo2D, including modeling exercises); impact of field devices on system performance (including modeling exercises) and installation, maintenance, testing & management of change.

**Your presenter:** PAUL GRUHN - ICS Triplex  

- Training Manager at ICS Triplex, a Rockwell Company  
- ISA Fellow & ISA 84 Expert  
- Member of the ISA 84 standard committee (on safety instrumented systems)  
- Certified Functional Safety Expert (CFSE)  
- Developer and instructor of ISA courses on safety systems

- Author of two ISA textbooks, two chapters in other books, and over two dozen published articles
- Developer of the first commercial safety system software modeling program
- B.S. degree in Mechanical Engineering from Illinois Institute of Technology  
- Licensed Professional Engineer (Ohio, Illinois)

- Prolific Author on SIS Topics including Technical Papers and Book Sections

**Your presenter:** EDWARD MARSZAL - Kenexis Consulting  

- President, Kenexis Consulting Corporation  
- Award-winning Author of the “Safety Integrity Level Selection” textbook from ISA  
- Prolific Author on SIS Topics including Technical Papers and Book Sections

- Licensed Professional Engineer (Ohio, Illinois)
- ISA 84 Expert Certification & ISA Fellow
- B.S. Chemical Engineering, The Ohio State University

**WORKSHOP 2  1.30pm - 5.30pm**  
**Risk-Based Fire and Gas Detection and Suppression System**

As a result of the recently released ISA technical report TR 84.00.07 - Guidance on the Evaluation of Fire, Combustible Gas, and Toxic Gas System Effectiveness, there has been a move toward the use of risk-based methods instead of prescriptive, rule-based methods for the purposes of design and implementation of equipment related to chemical process safety.

This tutorial presents an overview of the analysis techniques that are recommended to perform risk-based fire and gas detection.  

Detector characterization, which is the technique for quantifying a detector’s ability to detect a fire based on the amount of thermal radiation that it is exposed to, will be presented, as well as the concept and procedures for determining geographic coverage, or the fraction of physical area in which a detector array can sense an event, and scenario coverage or the fraction of hazardous event frequency that can be detected by a given detector array.

The goal is to improve upon the state of the art methods for risk-based fire and gas system design.

**Your presenter:** PAUL GRUHN - ICS Triplex  

- ISA Fellow & ISA 84 Expert  
- Member of the ISA 84 standard committee (on safety instrumented systems)  
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- Licensed Professional Engineer (Ohio, Illinois)
- ISA 84 Expert Certification & ISA Fellow
- B.S. Chemical Engineering, The Ohio State University

**GENERAL INFORMATION**

**Confirmation Details**

A confirmation & information letter will be sent to all delegates approximately 10 days prior to the conference. Please ensure that you provide both your mailing address and email address on the booking form.

**Cancellation Policy**

Full reimbursement will be accepted if written notification of cancellation is received by IDC Technologies on or before April 23 2010. A fee of 20% will apply to any cancellations received between April 24 & 4 May 2010. No cancellation requests can be accepted after 5 May 2010, however from this date substitute delegates are welcome.

**Venue**

Executive Royal Inn Hotel & Conference Centre  
2828 - 23rd Street N.E.  
Calgary, Alberta T2E 8T4  
Phone: (403) 291-2003

**Accommodation**

The conference venue has accommodation available. Contact the Royal Inn on (403) 291-2003 to make a booking. Quote the group number # 6471 to receive the special room rate of $119 + taxes or mention IDC Technologies.

**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**

1800 324 4244

**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.

1. **By Fax:**  
   1800 434 4045

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   Suite 402, 814 Richards Street,  
   Vancouver, BC V6B 3A7

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