



March, 2006

# ANNUNCIATOR

SARNIA  SECTION  
The Instrumentation, Systems, and Automation Society

## Upcoming Events

- ▶ April 11, 2006 - London Dinner Meeting
- ▶ April 18, 2006 - Windsor Dinner Meeting (for both meetings call Kalpen at 519-336-7301)
- ▶ May 29, 2006 - "Bring your wives" Awards Dinner Meeting
- ▶ June 9, 2006 - ISA Golf Tournament

## 2006 Directory



The 2005 Sarnia ISA Directory is now available. Call... Kevin (519) 333-6705 for details.



The Sarnia Section has a domain on the internet. Next time you're on the net give us a look at:

[www.isasarnia.com](http://www.isasarnia.com)

# DINNER MEETING NOTICE



## MONDAY

### MARCH 27, 2006

SARNIA GOLF & CURLING CLUB

500 Errol Road West, Sarnia

Phone: (519) 336-2201

Cocktails 6:00 p.m. - Dinner 7:00 p.m.

All Guests are Welcome!



## GUEST SPEAKER...

### JACKIE M. GRANT

*Topic... "Control Room Operator Support for the Process Industry"*

*Issues such as people retention, the increase in the average age of operations and maintenance professionals and the pressure to do more with less can impact Knowledge Management. Make your control room operators better decision makers by giving them real time access to critical information, rules and procedures. These tools enable you to organize, manage, share and reuse operator "know how" in relation to critical process systems.*

## MENU

CRISP ICEBURG HOUSE SALAD  
 LEMON CHICKEN SUPREME  
 MASH POTATO  
 MIXED GREENS  
 CARROT CAKE

NOTE: KINDLY BOOK BEFORE DEADLINE INDICATION.

Please phone in or E-Mail your reservation by...

March 23, 2006 to... MAUREEN LYNAS

Phone: (519) 336-3006 • Fax: 344-0607

E-Mail: [maureen.lynas@willereng.com](mailto:maureen.lynas@willereng.com)

New Member Benefit!

MEMBERS \$10 ▶ GUESTS \$20

NOTE: ALL Members and guest are requested to reserve in advance.

Please oblige... we need your support to plan your evening!

# Guest Speaker Abstract

Jackie M. Grant - CanWeb

Jackie Grant is Vice-President for CanWeb, a provider of operator support solutions, network communications including TCP/IP, remote access solutions and web-based services. Over the past 15 years, she has held a variety of positions in the information technology space, including strategic marketer for emerging technologies, sales, marketing and public relations. As a founder and managing partner of CanWeb, Mrs. Grant has worked with a diverse client base that includes customers in over 100 countries around the world.

## January Dinner Meeting



ISA's James Callery (right) presents Mike Grey of Lambton College with his door prize for the January Dinner Meeting.



Awards Chair Shailesh Bhadresa (right) presents January Dinner Meeting Speaker Amir Ghoreishi of Siemens Canada with gift for his informative talk on radar level technology.



## ISA Membership Application

- JOIN ONLINE TODAY AT [www.isa.org](http://www.isa.org) OR,**
- MAIL** this form to: ISA, PO Box 3561, Durham, NC 27702-3561, USA **OR,**
- FAX** to (919) 549-8288 (credit card required) **OR,**
- CALL** ISA Member & Customer Services at (919) 549-8411

*ISA is the international society for measurement and control<sup>®</sup>*

Sponsor Name:

\_\_\_\_\_

Sponsor Member No.:

\_\_\_\_\_



# President's Message

Greetings once again from the Sarnia ISA section executive. We had a great executive meeting recently, and discussed many things, primarily how we can make ISA and the section, better for you, the members. This really focuses on the initiatives from RTP for the Membership Regeneration Drive, and the Membership Recruitment and Retention. This is an organization really driven from the bottom up. So, how does, or should this work? You, the member can determine the direction the Society takes, and help move it down that road. Simply become involved, and tell us what you want. We are listening, and we feel that people want more social activities, and fun things. We are evaluating ways to do this. One of these activities will

be the annual awards night meeting in May, and I think you will be pleased with what Kalpen is putting together. Watch for it.

We are also looking at ways to schedule some plant tours, focusing of course, on the control systems. Perhaps we will be surprised at how different, yet how similar the ways of doing business are. Anyone able to help us with their plant site is welcome to contact us. We are also evaluating having at least one purely social function in the coming months, just so we can relax and network.

I ask only that you think about these things, tell us what you like about the ideas, and of course, what you don't like. I would expect any member of the executive to be

ready to listen to what people have to say and bring it back to an executive meeting, but of course, anyone who would like to contact me personally is more than welcome. I'm always pleased to have the input.

On another front, we are opening up some positions on the executive to allow some student members to participate. I am hoping to have a positive response to this, and would expect some great new perspective to come out of it.

We are also continuing with our program to hold special meetings in London and Windsor. Special thanks again to Kalpen for carrying the ball on this.

**Don Murch, CET**  
ISA Sarnia Section President



## Executive 2005-2006

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Safety systems are installed to mitigate the risk of undesirable events. What types of failures could compromise the ability of an Interlock to prevent the undesirable event? There are two basic types of failures to consider: Random and Systematic. Common cause failures can potentially affect multiple devices within a subsystem. Common cause failures can be of either random or systematic type.

The definitions from ISA-84.00.01-2004 are:

- **Systematic failure** is a failure related in a deterministic way to a certain cause, which can only be eliminated by a modification of the design or of the manufacturing process, operational procedures, documentation or other relevant factors. Note: Human errors can be a significant cause of systematic failures.

- **Random hardware failure**

A failure, occurring at a random time, which results from a variety of degradation mechanisms in the hardware.

A major distinguishing feature between random hardware failures and systematic failures is that system failure rates (or other appropriate measures), arising from random hardware failures, can be predicted but systematic failures, by their very nature, cannot be predicted. That is, system failure rates arising from random hardware failures can be quantified but those arising from systematic failures cannot be statistically quantified because the events leading to them cannot easily be predicted.

Systematic failures are due to errors made in design and cause the Interlock to fail every time a particular set of conditions occurs. Three of the most common types of errors are specification errors, equipment errors and software errors. Some examples of systematic errors are inappropriate materials of construction, installation errors, poor maintenance, programming errors, human errors in the Safety requirements Specification or implementation of the software. Heat, vibration and other external factors can cause systematic errors. It is impossible to predict how often systematic failure leads to Interlock failure.

### Common cause failure

Failure, which is the result of one or more events, causing failures of two or more separate channels in a multiple channel system, leading to system failure.

How can errors be detected and prevented to improve the safety instrumented system?

Redundancy can be used to increase fault tolerance against random hardware failures but it may not be effective against systematic failures. Redundant devices can be affected by common systematic failures such as manufacturing errors, environmental factors and human error. Diversity such as different devices, systems, technology and programmers can reduce common systematic failures. The most effective defense against systematic failure is full integration of the ISA-84.01-2004 safety lifecycle and functional safety management concepts into the project management process.

Analysis of failure modes can help to understand and plan to reduce the failures. Diagnostics in the equipment and software by users and manufacturers can reduce the equipment failure rates or increase the diagnostic coverage to improve the SIS safety and reliability performance. Careful thought and planning should be taken to improve the quality of every step of the safety lifecycle process to reduce errors. Use of fault tolerant architectures and careful use of diversity can reduce the risk of failures. Selection of equipment that has been approved for SIS use can have known and reduced failure rates, safe failure fraction and diagnostic coverage information for assessment and verification calculations. This equipment data can be provided by the manufacturer. The web site [www.exida.com](http://www.exida.com) maintains a Safety Automation Equipment List of qualified safety equipment. The list does not include the actual data but does include contact information.

The design of the SIS must be verified to ensure that it meets the target Safety Integrity Level (SIL) determined by risk analysis. Careful selection of equipment failure rates are needed for accurate results. Refer to ISA TR84.00.02 for evaluation techniques and references listed below. Utilize techniques that include common cause and systematic errors for the most accurate results.

If you have an interest in Safety Systems the ISA Safety Division may help you learn more and network with experts and other users who share your interest. It has helped me tremendously.

### References:

- 1) ISA-84.00.01-2004, Functional Safety: Safety Instrumented Systems for the Process Industry Sector.
- 2) ISA -TR84.00.02-2002 parts 1 to 5, Safety Instrumented Functions (SIF) - Safety Integrity Level (SIL) Evaluation Techniques.
- 3) ISA TR-84.00.04-2005 part 1, Guidelines for the Implementation of ANSI/ISA-84.00.01-2004
- 4) OREDA Handbook 2002, <http://www.dnv.com/technologyservices/handbooks/OREDA/oreda.asp>
- 5) Safety Equipment Reliability Handbook (second edition), <https://www.exida.com/exida2/stores/1/Safety-Equipment-Reliability-Handbook-Second-Edition-P141C2.aspx>
- 6) Safety Instrumented Systems: Design, Analysis and Justification" 2nd Edition, ISA, 2005.
- 7) Safety Instrumented Systems Verification - Practical Probabilistic Calculations, ISA 2005