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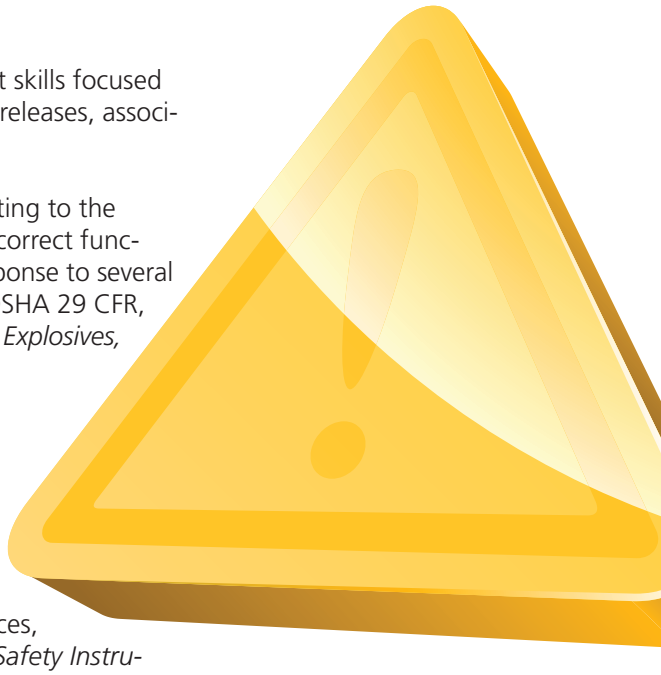
# Functional Safety Resources

*Setting the Standard for Automation™*

# ISA's Suite of Standards, Training, and Technical Resources Offers Real-World Solutions for Strengthening Your Company's Functional Safety Program



Process safety may be defined as a blend of engineering and management skills focused on preventing catastrophic accidents, such as explosions, fires, and toxic releases, associated with processes involving chemicals and petroleum products.

Within process safety, the field of functional safety explores safety topics relating to the process and the Basic Process Control System (BPCS), which depends on the correct functioning of the Safety Instrumented System and other protection layers. In response to several accidents, agencies of the U.S. Government developed two key regulations: OSHA 29 CFR, 1910.119-1992, *Process Safety Management of Highly Hazardous Chemicals, Explosives, and Blasting Agents*; and EPA 40 CFR Part 68, *Accidental Release Prevention Requirements: Risk Management Programs under the Clean Air Act.* These regulations helped to define areas that must be addressed in order to achieve a mandated level of functional safety performance in industry.

In the late 1980s, the International Society of Automation (ISA) recognized the need for an improved approach in handling process sector functional safety issues and established the ISA84 standards committee. ISA84 brought process safety experts together to develop industry standards and best practices, including the first edition of ISA84, released in 1996, entitled *Application of Safety Instrumented Systems for the Process Industries*. Later, the committee released ANSI/ISA-84.00.01-2004 Parts 1-3 (IEC 61511 Mod), *Functional Safety: Safety Instrumented Systems for the Process Industry Sector.* This three-part series of consensus-developed standards gives requirements for the specification, design, installation, operation, and maintenance of a safety instrumented system, so that it can be confidently entrusted to place and/or maintain a process in a safe state. Through its working groups, ISA84 has also developed several key technical reports to provide guidance on the implementation and use of the three-part series of standards.

ISA has formed several additional committees to develop international standards, best practices, and technical reports to address functional safety elements. ISA18, *Instrument Signals and Alarms*, has published standards establishing terminology and practices for alarm systems, including the definition, design, installation, operation, maintenance and modification, and work processes recommended to effectively maintain an alarm system over time. Other ISA standards committees are focused on industry-specific safety standards for fossil fuel and nuclear power plants.

Process safety incidents are largely referred to as "high consequence, low frequency events," but dozens of spills, leaks, fires, and explosions continue to occur worldwide each month, ranging from near-misses to catastrophic events with life-changing implications for people, property, and companies involved. Following the latest industry best practices in your plant is only a starting point to prevent incidents—companies must align employee training, operational standards, and management approaches to truly enhance their safety profiles. ISA offers training courses, a comprehensive Safety Instrumented Systems certificate program, books, and technical resources to help companies develop and implement a functional safety program that protects people and assets.

# Process Industry Functional Safety Standards

## ISA84: Electrical/Electronic/Programmable Electronic Systems (E/E/PES) for Use in Process Industry Safety Applications

Safety Instrumented Systems have been used for many years to perform safety instrumented functions in the process industries. If instrumentation is to be effectively used for safety instrumented functions, it is essential that this instrumentation achieves certain minimum standards and performance levels. The ISA84 series of international standards addresses the application of Safety Instrumented Systems for the process industries. The series also deals with the interface between Safety Instrumented Systems and other safety systems, requiring that a process hazard and risk assessment be carried out.

**ANSI/ISA-84.00.01-2004 Part 1** ***(IEC 61511-1 Mod) Functional Safety: Safety Instrumented Systems for the Process Industry Sector - Part 1: Framework, Definitions, System, Hardware and Software Requirements***
This standard gives requirements for the specification, design, installation, operation, and maintenance of a safety instrumented system, so that it can be confidently entrusted to place and/or maintain the process in a safe state. This standard has been developed as a process sector implementation of IEC 61508.
ISA Member Price: $359.00
Affiliate Member Price: $389.00
Community Member/List Price: $419.00

**ANSI/ISA-84.00.01-2004 Part 2** ***(IEC 61511-2 Mod) Functional Safety: Safety Instrumented Systems for the Process Industry Sector - Part 2: Guidelines for the Application of ANSI/ISA-84.00.01-2004 Part 1 (IEC 61511-1 Mod) - Informative***
This standard provides guidance on the specification, design, installation, operation and maintenance of Safety Instrumented Functions and related safety instrumented system as defined in ANSI/ISA-84.00.01-2004 Part 1 (IEC 61511-1 Mod).
ISA Member Price: $359.00
Affiliate Member Price: $389.00
Community Member/List Price: $419.00

**ANSI/ISA-84.00.01-2004 Part 3** ***(IEC 61511-3 Mod) Functional Safety: Safety Instrumented Systems for the Process Industry Sector - Part 3: Guidance for the Determination of the Required Safety Integrity Levels - Informative***
This standard provides information on the underlying concepts of risk, the relationship of risk to safety integrity, the determination of tolerable risk, and a number of different methods that enable the safety integrity levels for the safety instrumented functions to be determined.
ISA Member Price: $292.00
Affiliate Member Price: $317.00
Community Member/List Price: $342.00

**ISA-TR84.00.04-2011, Part 1** ***Guideline for the Implementation of ANSI/ISA-84.00.01-2004 (IEC 61511)***
ANSI/ISA-84.01-1996 has been retired and replaced with ANSI/ISA-84.00.01-2004 Parts 1-3 (IEC 61511 Mod). The new standard is the ANSI/ISA adoption of the international standard, IEC 61511. This technical report is divided into two parts. Part 1 provides guidance on a wide range of topics related to the standard, and Part 2 provides a single user example to illustrate some of the lifecycle steps in ANSI/ISA-84.00.01-2004.
ISA Member Price: $186.00
Affiliate Member Price: $208.00
Community Member/List Price: $230.00

**ISA-TR84.00.04-2005 Part 2:** ***Example Implementation of ANSI/ISA-84.00.01-2004 (IEC 61511 Mod)***
This technical report is intended to be used in conjunction with ISA-TR84.00.04-2005 Part 1 to provide an example that illustrates how to apply ANSI/ISA-84.00.01-2004 (IEC 61511 Mod).
ISA Member Price: $72.00
Affiliate Member Price: $81.00
Community Member/List Price: $90.00

**ANSI/ISA-84.91.01-2012 Identification and Mechanical Integrity of Safety Controls, Alarms, and Interlocks in the Process Industry**
This standard addresses the instruments that are classified as process safety safeguards by the authority having jurisdiction (typically the owner/operator or local regulatory authority), and establishes requirements for their mechanical integrity, including inspection/testing and documenting the inspection/test results.
ISA Member Price: $48.00
Affiliate Member Price: $54.00
Community Member/List Price: $60.00

**Find ISA84 standards and technical reports at** www.isa.org/isa84

## ISA18: Instrument Signals and Alarms

The ISA18 series of standards focuses on a key part of the safety system lifecycle—alarm management. The ISA18 series defines the terminology and models to develop an alarm system, along with the work processes recommended to effectively maintain the alarm system throughout the lifecycle.

**ANSI/ISA-18.2-2009**
***Management of Alarm Systems for the Process Industries***
This standard addresses the development, design, installation, and management of alarm systems in the process industries. Alarm system management includes multiple work processes throughout the alarm system lifecycle. This standard defines the terminology and models to develop an alarm system, and it defines the work processes recommended to effectively maintain the alarm system throughout the lifecycle.
ISA Member Price: $144.00
Affiliate Member Price: $162.00
Community Member/List Price: $180.00

**ISA-TR18.2.4-2012**
***Enhanced and Advanced Alarm Methods***
This technical report provides guidance on enhanced and advanced alarm methods and focuses on the scope of Clause 12 of ISA-18.2. Enhanced alarm design covers guidance on additional logic, programming, or modeling used to modify alarm behavior. These methods may include: dynamic alarming, state-based alarming, adaptive alarms, logic-based alarming, and predictive alarming, as well as most of the designed suppression methods.
ISA Member Price: $104.00
Affiliate Member Price: $117.00
Community Member/List Price: $130.00

**ISA-TR18.2.5-2012**
***Alarm System Monitoring, Assessment, and Auditing***
This technical report provides guidance on monitoring, assessment and audit of alarms. The report focuses on the scope of ANSI/ISA-18.02-2009 Clauses 16 and 18. Monitoring, assessment, and audit cover the continuous monitoring, periodic performance assessment, and recurring audit of the alarm system.
ISA Member Price: $104.00
Affiliate Member Price: $117.00
Community Member/List Price: $130.00

**ISA-TR18.2.6-2012**
***Alarm Systems for Batch and Discrete Processes***
This technical report covers the application of alarm management principles in ISA-18.2 to batch and discrete processes. The general principles and techniques described in this technical report are intended for use in the lifecycle management of an alarm system based on programmable electronic controller and computer-based human machine interface (HMI) technology.
ISA Member Price: $104.00
Affiliate Member Price: $117.00
Community Member/List Price: $130.00

**Find ISA18 standards and technical reports at** www.isa.org/isa18

### Get Involved!

- Join the ISA84 and ISA18 committees as an informational member – email Linda Wolffe, **lwolffe@isa.org**
- Log on and purchase the standards—**http://www.isa.org/isa84** and **http://www.isa.org/isa18**
- Contact our partner, IHS, about licensing the standards in your company – email Robert Madsen, **robert.madsen@ihs.com**

**Join ISA for just $110 per year and view the standards for FREE!** www.isa.org/join

# Process Industry Safety Training Resources

From process safety fundamentals and SIS design to advanced Safety Integrity Level selection and verification—and everything in between—ISA covers functional safety from every angle. ISA offers an ISA84 certificate program to recognize individuals who complete specified courses and pass review exams for each course. Safety is also a key domain within ISA's certification programs and the Automation Competency Model.

ISA's world-renowned safety experts provide the comprehensive, practical instruction needed to immediately apply knowledge in the workplace, and through a wide variety of learning formats. All ISA training courses provide relevant examples and case histories, further reinforcing the practical and real-world work environment. To ensure flexibility and to meet varying customer needs, ISA offers safety training at a variety of locations: ISA headquarters in North Carolina, ISA's many regional training centers, onsite directly at customer facilities, and online via distance learning.

Wondering which of these courses are right for your employees? Schedule an ISA Needs Assessment—we'll send a seasoned professional to your facility to interview your team and determine their individual strengths and challenges. You'll get a customized, comprehensive training plan that you can use as a roadmap to develop your staff. Contact Matt Rothkopf, ISA Senior Learning Specialist, at mrothkopf@isa.org to learn more.

**Safety Instrumented Systems—Design, Analysis, and Justification (EC50)**
www.isa.org/SAFE/EC50
This course focuses on the engineering requirements for the specification, design, analysis, and justification of safety instrumented systems (SIS) for the process industries. Students will learn how to determine Safety Integrity Levels (SILs) and evaluate whether proposed or existing systems meet the performance requirements.

*This course, if taken with the certificate exam, serves as the basis for Certificate 1 in the ISA84 Safety Instrumented Systems Certificate Program. Students who complete the course and pass the review exam will earn the* ***ISA84 SIS Fundamentals Specialist*** *certificate, a required pre-requisite for the two additional certificates in the program.*

"Simply reading a book or the standard on SIS design is no guarantee of understanding. This ISA training course is a useful way for someone to show their qualifications in SIS."

**Paul Gruhn, P.E., ISA Instructor**

**Advanced Safety Integrity Level (SIL) Selection (EC52)**
www.isa.org/SAFE/EC52
This course focuses on hands-on examples of safety integrity level (SIL) selection using a variety of different techniques. Students will be more able to develop and implement different SIL selection techniques, including risk matrices, risk graphs, and Layer of Protection Analyses (LOPA). The course covers methods for determining the appropriate level of performance needed of safety systems and preventing over- or under-designing system requirements to save your organization time and money.

*This course, if taken with the certificate exam, serves as the basis for Certificate 2 in the ISA84 Safety Instrumented Systems Certificate Program. Students who complete the ISA84 SIS Fundamentals Specialist certificate are eligible to take this course and sit for the review exam in order to earn the* ***ISA84 SIL Selection Specialist*** *certificate.*

**Advanced Design and SIL Verification (EC54)**
www.isa.org/SAFE/EC54
This course focuses on more detailed design issues and further hands-on examples of system analysis/modeling. Course work focuses on analyzing any system's technology and configuration to see if it will meet the required safety integrity level (SIL); determining if existing systems are safe enough (or whether they need to be upgraded); and evaluating proposed systems against performance requirements.

*This course, if taken with the certificate exam, serves as the basis for Certificate 3 in the ISA84 Safety Instrumented Systems Certificate Program. Students who complete the ISA84 SIS Fundamentals Specialist certificate are eligible to take this course and sit for the review exam in order to earn the* ***ISA84 SIL Verification Specialist*** *certificate, the third certificate in the program.*

## ISA84 Safety Instrumented Systems Certificate Program

ISA offers three certificates, each including specialized training on ISA84 and an exam that is offered through the worldwide network of Prometric testing centers. Those who register for the training course and the certificate program and pass the exam will be issued an ISA certificate specifying that they have successfully completed that certificate program.

**Certificate 1:**
**ISA84 SIS Fundamentals Specialist**
This certificate requires the completion of the four-day instructor-led ISA training course EC50 with exam (or the online, instructor-assisted version, EC50E, with exam). This Certificate is required to apply for Certificate 2 and Certificate 3. No application required.

**Certificate 2:**
**ISA84 SIL Selection Specialist**
This certificate requires the completion of the two-day instructor-led ISA training course EC52 with exam. Certificate 1 is a prerequisite. Application required.

**Certificate 3:**
**ISA84 SIL Verification Specialist**
This certificate requires the completion of the two-day instructor-led ISA training course EC54 with exam. Certificate 1 is a prerequisite. Application required.

**Earn all three certificates and become an ISA84 SIS Expert**
Individuals who achieve Certificates 1, 2, and 3 are designated as ISA84 Safety Instrumented Systems (SIS) Experts.

**Learn more about these certificate programs, eligibility criteria, renewal, and upcoming courses at** www.isa.org/ISA84Certificate

**Fire and Gas System Engineering—Performance Based Methods for Process Facilities (EC56P)**
www.isa.org/SAFE/EC56P
Fire and gas detection and suppression system design techniques that are currently in use are often considered to be unsatisfactory due to their nature of being rule-of-thumb and experience-oriented without any real ability to quantify risk. This has resulted in systems that are either over- or under-designed. The development of ISA-TR-84.00.07, *Guidance of Fire Combustible Gas and Toxic Gas System Effectiveness*, resulted in a comprehensive framework for performance-based fire and gas design. This course, designed for all users of fire and gas systems, describes the techniques recommended in this technical report, along with hands-on use of the techniques and associated software tools.

**Boiler Control Systems Engineering (ES15)**
www.isa.org/SAFE/ES15
This course covers boiler components, symbols used in boiler control, how to identify the engineering and control of boilers using these symbols, and a method of presenting the engineering. Students learn about concepts like control and ratio control fundamentals, feed forward control, feed forward plus feedback control, cascade control, ratio control, flame detection methods and applications, and more.

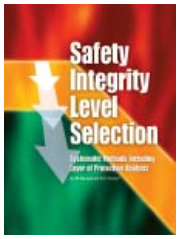
**Burner Management Systems Engineering Using NFPA Code 85 and ANSI/ISA77 Standards (ES16)**
www.isa.org/SAFE/ES16
This course covers the safe start-up, monitoring, and shut-down of multiple burner boiler furnaces. Students will explore causes of furnace explosions and the relationship between burner management systems (BMS) and boiler control systems.

**Applying Instrumentation in Hazardous (Classified) Locations (ES10)**
www.isa.org/SAFE/ES10
This course provides a detailed, systematic approach to specifying and implementing instrumentation in hazardous locations. Related standards from National Fire Protection Association (NFPA), National Electrical Manufacturers Association (NEMA), International Electrotechnical Commission (IEC), American Petroleum Institute (API), and ISA are discussed.

**Transducer/Transmitter Installation for Nuclear Safety Applications Using ANSI/ISA-67.01.01 (IC67)**
www.isa.org/SAFE/IC67
This course will cover the ANSI/ISA-67.01.01 standard relating to the installation of transducers for nuclear safety-related applications. The course emphasis will be a review of established requirements and recommendations for the installation of transducers and auxiliary equipment for nuclear applications outside of the main reactor vessel.

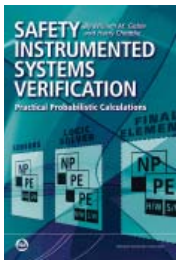
**ANSI/ISA-67.04-2006: Setpoints for Nuclear Safety-Related Instrumentation (IC68P)**
www.isa.org/SAFE/IC68P
The ANSI/ISA-67.04-2006 standard is intended for use in establishing procedures for determining setpoints, setpoint margins, and test routines in safety-related instrument channels. The 2006 version of the standard is consistent with the current Nuclear Regulatory Commission (NRC)'s guidance and will provide the information necessary to comply with this guidance. This course will discuss the terminology and the appropriate use of the latest version of the ANSI/ISA67 standard and the steps necessary for the development of safety-related setpoint analysis. ANSI/ISA-67.04.01 has been used as the basis for many plant-specific setpoint programs and setpoint calculations. The changes to this standard should be reflected in all programs where compliance to NRC requirements is necessary, and the course will cover specifics on implementing these changes in your facility.

# Process Industry Safety Reference Publications



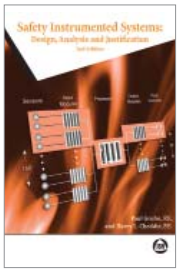

**Safety Integrity Level Selection—Systematic Methods Including Layer of Protection Analysis**
*Edward M. Marszal, P.E., Dr. Eric W. Scharpf, MIPENZ*

This book, which describes a systematic method for selecting safety integrity levels for safety instrumented systems (SIS), won the prestigious *Thomas G. Fischer Award of Excellence* for its comprehensive presentation of a process to help professionals select safety integrity levels. The method described in the book ensures that maximum return on risk reduction investment is achieved, because the process applies simple, yet powerful, tools of quantitative risk analysis to the problem of selecting safety integrity levels for safety instrumented systems, taking into account any existing layers of protection.
ISA Member Price: $85.00
Affiliate Member Price: $95.00
Community Member/List Price: $105.00
www.isa.org/SAFE/SafeIntegrity




**Safety Instrumented Systems Verification—Practical Probabilistic Calculations**
*William M. Goble and Harry Cheddie*

This book, available in digital and print formats, clearly explains how to do probabilistic calculations to accomplish SIL verification for safety systems. Starting with a description of the safety life cycle, the authors show where and how SIL verification fits into the key activities from conceptual design through commissioning. The book not only explains the theory and methods for doing the calculations, the authors also provide many examples from the chemical, petrochemical, power, and oil and gas industries.
ISA Member Price: $85.00
Affiliate Member Price: $95.00
Community Member/List Price: $105.00
Mobi (Kindle) and e-Pub (iPad) Price: $40.00
www.isa.org/SAFE/InstrSystems




**Safety Instrumented Systems: Design, Analysis, and Justification, Second Edition**
*Paul Gruhn, P.E., CFSE and Harry L. Cheddie, P.Eng., CFSE*

This revised best-seller addresses the increased realization that today's engineering systems—and the computers used to control them—are capable of large-scale destruction. When even a single accident could be disastrous, the luxury of learning from experience no longer exists. This book is a practical how-to text on the analysis, design, application, and installation of safety instrumented systems, perfect for instrumentation and control system engineers in the process industries who are responsible for designing, installing, and maintaining safety instrumented systems. Engineers, managers, technicians, and sales professionals employed by end users, engineering firms, systems integrators, and consultants can all benefit from the material.
ISA Member Price: $87.00
Affiliate Member Price: $98.00
Community Member/List Price: $109.00
www.isa.org/SAFE/InstrSystems2

**Safety Equipment Reliability Handbook, 3rd Edition** – A Three Volume Set

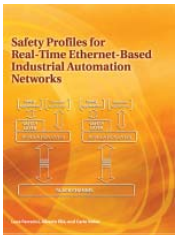
This comprehensive handbook is the ultimate reference book for any safety engineer involved in Conceptual Design and Safety Integrity Level verification. It provides a tremendous amount of detailed reliability data for both specific manufacturer products as well as generic equipment items. This set includes three volumes, available for individual purchase.

**Volume 1: Sensors** includes a comprehensive review of topics like Process Connections, Fire and Gas Detection, Flame Monitoring, Flow Measurements, Level Measurements, Pressure Measurements, Proximity Measurements, and Temperature Measurements.

**Volume 2: Logic Solvers and Interface Modules** covers Input Interface Modules, HART Communication Interfaces, Programmable Electronic Systems, Fire and Gas Controllers, Limited Functionality Systems and Relays, and Output Interface Modules.

**Volume 3: Final Elements** includes discussion on Final Element Interfaces, Pneumatic Interfaces, Actuators, Valves, Actuator-Valve Combinations, Gas Pressure Regulating Valves, and Other Final Elements.

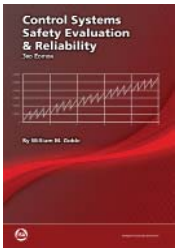
ISA Member Price (per volume): $495.00
Affiliate Member Price (per volume): $495.00
Community Member/List Price (per volume): $495.00
Three-Volume Series: $1,350.00
www.isa.org/SAFE/ReliabilityHB




**Safety Profiles for Real-Time Ethernet-Based Industrial Automation Networks**
*Alberto Elia, Luca Ferrarini, and Carlo Veber*

This book discusses network systems in industrial automation and their features related to real-time and functional safety requirements. The authors provide an overview of standard Ethernet, specifying the Open System Interconnection (OSI) reference model layers and identifying Ethernet's drawbacks, providing clarification on the requirements and the solutions adopted by the presented communication protocols. Real-time capability is defined with regard to communication within safety-related systems, underlying the strict correlation between time performances and external requirements.

ISA Member Price: $55.00
Affiliate Member Price: $62.00
Community Member/List Price: $69.00
www.isa.org/SAFE/EBIAN




**Control Systems Safety Evaluation and Reliability, Third Edition**
*William M. Goble*

This updated text provides the detailed background necessary to understand how to meet important new safety regulations and reliability engineering topics. Professional control system designers will learn to properly evaluate control system components, various system architectures, how to better communicate with vendors, and how to increase accuracy of life-cycle cost estimates. The author provides a basic foundation for several critical concepts, including probability, statistics, reliability theory definitions, and basic reliability modeling techniques, as well as advanced topics relevant to safety instrumented and control systems. Each chapter contains exercises to assist the reader in applying the theories presented with their practical implementation.

ISA Member Price: $95.00
Affiliate Member Price: $107.00
Community Member/List Price: $119.00
www.isa.org/SAFE/SafetyEvaluation

# *InTech* magazine:

## Your source for the latest news and trends on functional safety and dozens of other relevant topics

ISA's flagship bimonthly publication, *InTech* magazine, features editorial coverage on the latest topics and trends in industrial automation. Log on to www.isa.org/intech to browse through recent articles, search for case studies and white papers, and more.

Read these in-depth articles on process safety at **www.isa.org/intech:**

- *Improving analytics to meet process industry demands*, March/April 2013
- *Understanding safety life cycles*, January/February 2013
- *Top ten alarming blunders*, January/February 2013
- *When is "safe" safe? The value of a risk assessment*, November/December 2012
- Special Section: *Statistical process monitoring turns process noise into valuable information*, September/October 2012
- Special Section: *Specifying surge relief valves in liquid pipelines*, July/August 2012


**Find out if you qualify for a free subscription to *InTech* magazine—log on to** www.isa.org/SAFE/FreeInTech

# Technical Papers and Presentations

Each year, hundreds of peer-reviewed papers and presentations are delivered at ISA technical conferences around the world. ISA's collection of technical papers includes dozens of titles related to process safety, including:

- *Alarm Floods and Their Connection to Plant Incidents with Practical Steps to Minimize*
- *Alarm Rationalization Workshop Tips Tricks and Traps*
- *Application of Combustion Analyzers in Safety Instrumented Systems*
- *Engineering the Maintenance of Safety Instrumented Functions*
- *Financial Justification of Safety Instrumented Systems*
- *Improved Safety Through The Use Of Wireless Technology Results in a 25% Increase In Production*
- *Increasing Process Safety Performance for an Incident Free Day Today and Tomorrow*
- *Operator Response to Alarm as Protection Layer*
- *Principles and Terminology of Safety Instrumented Systems*
- *Safety Lifecycle Concept for Brownfields*
- *Safety Shutdown Systems Hardware Configurations*
- *Safety Systems Migration: Now, it's More Important than Ever*
- *Safety Systems: Tomorrow's Challenges*
- *Unlock Profitable Safety*

Purchase ISA's safety-related technical papers today— visit **www.isa.org/SAFE/techpapers**

**Join ISA at** www.isa.org/join **and download all of ISA's technical papers for FREE! Plus, earn a 20% discount on ISA's products!**

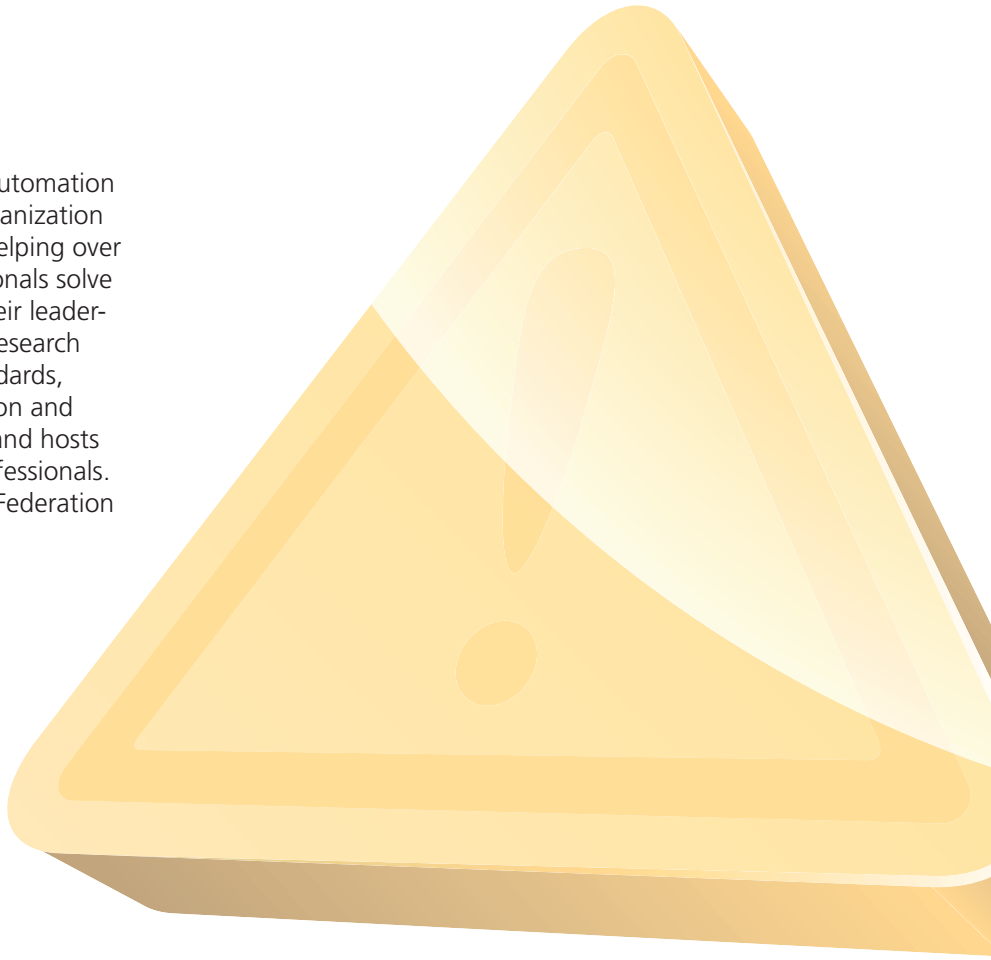
# Additional Resources for Individuals and Companies

## Join the ISA Safety and Security Division

As an ISA member, you'll have a chance to join two technical divisions for free—make one of them the ISA Safety and Security Division, your headquarters for the latest trends and information available regarding industrial cybersecurity and process safety. Division members get involved in programming ISA's conferences and symposia, publishing papers and articles, and discussing important topics on ISA's list serves and social media networks. Visit **www.isa.org/Community/divatsafety**

## Attend ISA Automation Week: ISA's Annual Technology and Solutions Event

By attending the ISA Automation Week, you'll get the big picture. For automation to deliver optimal value and results, it must be aligned with and incorporate the requirements of four fundamental operating factors: safety, people, business, and technology. Learn more at **www.isaautomationweek.org.**



Founded in 1945, the International Society of Automation (www.isa.org) is a leading, global, nonprofit organization that is setting the standard for automation by helping over 30,000 worldwide members and other professionals solve difficult technical problems, while enhancing their leadership and personal career capabilities. Based in Research Triangle Park, North Carolina, ISA develops standards, certifies industry professionals, provides education and training, publishes books and technical articles and hosts conferences and exhibitions for automation professionals. ISA is the founding sponsor of the Automation Federation (www.automationfederation.org).

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