



Standards
Certification
Education & Training
Publishing
Conference & Exhibits

Setting the Standard for Automation™



certificate
program

Specialized training
and recognition for
expertise in ISA84:

Certificate 1:
SIS Fundamentals Specialist

Certificate 2:
SIL Selection Specialist

Certificate 3:
SIL Verification Specialist

Courses taught by
KENEXIS

**Safety is
Everyone's Concern—**
ISA84* Safety Instrumented
Systems Training and
Certificate Programs

*IEC61511

ISA84 Safety Instrumented Systems (SIS) Certificate Programs

The International Society of Automation (ISA) and the Automation Standards Compliance Institute (ASCI) are offering three certificate programs that will increase knowledge and awareness of the ISA84 (IEC61511) standard.*

Each certificate program includes specialized training on ISA84 and an exam that is offered through Prometric testing centers. Those who register for the training course and the certificate program and successfully complete the exam will be issued an ISA certificate specifying their expertise as an

- **ISA84 SIS Fundamentals Specialist – Certificate 1**
- **ISA84 SIL Selection Specialist – Certificate 2**
- **ISA84 SIL Verification Specialist – Certificate 3**

An individual who achieves Certificates 1, 2, and 3 is designated as an **ISA84 Safety Instrumented Systems Expert**.

Not currently interested in pursuing the ISA84 SIS certificate programs? You can still register for just the ISA84 training courses.

Visit **URL** for more information.



ISA84 Certificates



Certificate 1: ISA84 SIS Fundamentals Specialist

requires the completion of either the 4-day instructor-led training course (EC50) with exam or the 8-week online, instructor-led course (EC50E) with exam. There are no required prerequisites; however, it is recommended that applicants have at least two (2) years experience in process automation and two (2) years technical-related education.



Certificate 2: ISA84 SIL Selection Specialist

requires the completion of the 2-day instructor-led training course (EC52) with exam. 75% of the training is focused on practical applications and exercises.

Prerequisites for this certificate include:

- Certificate 1: ISA84 SIS Fundamentals Specialist
- Five (5) years related experience in the process industry with a minimum of two (2) years experience in process safety in:
 - Facilitation of and/or participation in process hazard analysis (PHAs)
- OR
- SIL determination/selection, under supervision or independently



Certificate 3: ISA84 SIL Verification Specialist

requires the completion of the 2-day instructor-led training course (EC54) with exam. 75% of the training is focused on practical applications and exercises.

Prerequisites for this certificate include:

- Certificate 1: ISA84 SIS Fundamentals Specialist
- Five (5) years related experience in the process industry with a minimum of two (2) years experience in:
 - Specification of instruments and control systems
 - Programming of PLCs
 - SIL verification calculations
 - Creation/modification of I&C design documents
- OR
- Support of start-up or operation of process plants/facilities

***The ISA84 (IEC61511) standard is important to you because**

— it can help your organization systematically and continuously identify, reduce, and manage its process safety risks. The ANSI/ISA-84.00.01 standard is considered to be a generally accepted and recognized good engineering practice under OSHA's process safety management standard's performance-based requirements.

Safety Instrumented Systems— Design, Analysis, and Justification

**Expanded to Cover
More Content!**

Instructor-Led Training Course

Description:

This course focuses on the engineering requirements for the specification, design, analysis, and justification of safety instrumented systems (SISs) 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 is required for all of the ISA84 Safety Instrumented Systems Certificate Programs. You can register for the course only or for Certificate Program 1 which includes course and exam. Those who successfully complete this course and pass the exam receive the designation of ISA84 SIS Fundamentals Specialist.

You Will Be Able To:

- Differentiate between process control and safety control
- Implement the ISA84 (IEC61511) standard
- Evaluate process risk levels
- Calculate SILs using a variety of techniques
- Analyze the performance of different logic system technologies
- Analyze the performance of various sensor, logic, and final element configurations, as well as the impact of diagnostics, test intervals, common cause, system size, and more
- Calculate optimum system test intervals
- Specify and select SISs
- Apply the documentation requirements for process safety management, regulations, and industry standards

You Will Cover:

- **Introduction:** Danger of Overconfidence and Complacency
 - Lessons Learned from Past Accidents
- **Guidelines and Standards:** ANSI/ISA • AIChE • IEC • API
 - NFPA • HSE • IEEE • OSHA
- **General SIS Design Considerations:** Design Lifecycle
 - Separation of Control and Safety • Independent Safety Layers
- **Hazard and Risk Assessment:** Hazard Identification • Risk Assessment • Determining SILs • Layer of Protection Analysis (LOPA)
- **Failure Rates and Modes:** Safe vs. Dangerous • Failure Mode vs. Technology • Failure Rates • Test Intervals
- **System Technologies:** Pneumatic • Relays • Microprocessors
 - Field Devices • Certification • Prior Use
- **Operations and Maintenance:** Installation • Bypassing
 - Testing • Management of Change
- **Class Example:** Putting It All Together

Classroom/Laboratory Exercises:

- Calculate device failure rates and determine safe vs. dangerous performance
- Model system performance for relay- and software-based logic systems
- Model the impact of field devices, automatic diagnostics, manual test intervals, common cause, and more
- Determine the SIL of a sample process and design a SIS to meet the performance requirements

Students should bring a hand-held/scientific calculator to class.

Course Includes: (US\$838 Value!)

- ISA Text: *Safety Instrumented Systems: Design, Analysis and Justification, 2nd Edition*, by Paul Gruhn and Harry Cheddie
- ISA Standard: ANSI/ISA-91.00.01-2001: *Identification of Emergency Shutdown Systems and Controls that are Critical to Maintaining Safety in Process Industries*
- ISA Standard: ANSI/ISA-84.00.01-2004, Part 1: *Framework, Definitions, System Hardware and Software Requirements*
- ISA Standard: ANSI/ISA-84.00.01-2004, Part 2: *Functional Safety: Safety Instrumented Systems for the Process Industry Sector*
- ISA Standard: ANSI/ISA-84.00.01-2004, Part 3: *Guidance for the Determination of the Required Safety Integrity Levels—Informative*

Course Details:

Course No.: EC50

Length: **Now 4 days!**

CEU Credits: 2.8 (28 PDHs)

Course Price: Contact Kenexis for details

Certificate

Program Price: Contact Kenexis for details

**This course, or ISA course EC50E, is
required for ISA84 Certificate 1:
ISA84 SIS Fundamentals Specialist.**

Safety Instrumented Systems— Design, Analysis, and Justification

Online, Instructor-Assisted Training Course

Description:

This course focuses on the engineering requirements for the specification, design, analysis, and justification of safety instrumented systems (SISs) 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 is required for all the ISA84 Safety Instrumented Systems Certificate Programs. You can register for the course only or for Certificate Program 1 which includes course and exam. Those who successfully complete this course and pass the exam receive the designation of ISA84 SIS Fundamentals Specialist.

Format:

This CyberU course runs for eight (8) weeks. You will have access to seven online modules for the web/audio sessions. Each module takes approximately 60 minutes. Your course syllabus will guide you through the course modules and provide assignments and the schedule for live Q&A sessions.

Note: Each course module has been pre-recorded by your instructor so that you can access them on your schedule.

You Will Be Able To:

- Differentiate between process control and safety control
- Implement the ISA84 (IEC61511) standard
- Evaluate process risk levels
- Calculate SILs using a variety of techniques
- Analyze the performance of different logic system technologies
- Analyze the performance of various sensor, logic, and final element configurations, as well as the impact of diagnostics, test intervals, common cause, system size, and more
- Calculate optimum system test intervals
- Specify and select SISs
- Apply the documentation requirements for process safety management, regulations, and industry standards

You Will Cover:

Week/Module 1: Introduction and Background

Covers high profile process industry accidents, the legislation that resulted, and various lessons learned

Week/Module 2: Hazard Identification, Risk Assessment, and SIL Determination

Covers concepts and benefits of independent safety layers, hazard identification, risk assessment, and SILs

Week/Module 3: Layer of Protection Analysis—LOPA

Covers the semi-quantitative method of determining safety integrity levels called LOPA

Week/Module 4: Reliability and Modeling Issues

Covers reliability issues and explains the minimum hardware fault tolerance requirement tables in the standard

Week/Module 5: Logic System Technologies

Covers the safety requirements specification (SRS) and the pros and cons of pneumatic, relay, and microprocessor logic systems

Week/Module 6: Field Devices and Their Impact

Covers field devices, their impact, and the differences between using certified vs. proven-in-use devices

Week/Module 7: Installation and Beyond

Covers factory acceptance testing, installation, commission, validation, operations, maintenance, testing, bypassing, and management of change

Week 8: Course Exam (not the same as the Certificate Exam, which is administered separately)

Course Includes: (US\$838 Value!)

- Course noteset with slides from course modules and syllabus
- ISA Text: *Safety Instrumented Systems: Design, Analysis and Justification, 2nd Edition*, by Paul Gruhn and Harry Cheddie
- ISA Standard: ANSI/ISA-91.00.01-2001: *Identification of Emergency Shutdown Systems and Controls that are Critical to Maintaining Safety in Process Industries*
- ISA Standard: ANSI/ISA-84.00.01-2004, Part 1: *Framework, Definitions, System Hardware and Software Requirements*
- ISA Standard: ANSI/ISA-84.00.01-2004, Part 2: *Functional Safety: Safety Instrumented Systems for the Process Industry Sector*
- ISA Standard: ANSI/ISA-84.00.01-2004, Part 3: *Guidance for the Determination of the Required Safety Integrity Levels – Informative*

Note: Course materials will be provided to all course registrants prior to the course start date.

Course Details:

Course Number: EC50E

Length: 8 weeks

CEUs: 3.5 (35 PDHs)

Course Price: Contact Kenexis for details

Certificate

Program Price: Contact Kenexis for details

This course, or ISA course EC50, is required for ISA84 Certificate 1: ISA84 SIS Fundamentals Specialist.

Advanced Safety Integrity Level (SIL) Selection

Instructor-Led Training Course



Description:

This course focuses on hands-on examples of safety integrity level (SIL) determination using a variety of different techniques. Students will be better able to save their companies time and money through the optimization of system performance requirements.

This course is required for the ISA84 Safety Instrumented Systems Certificate Program 2. You can register for the course only or for the certificate program which includes course and exam. If you are registering for the certificate program, you must complete an application and document eligibility criteria to sit for the certificate exam at least six (6) weeks prior to taking the course. Those who successfully complete this course and pass the exam receive the designation of ISA84 SIL Selection Specialist.

You Will Be Able To:

- Develop and implement different SIL determination techniques within your organization
 - Risk matrix
 - Risk graph
 - Layer Of Protection Analysis (LOPA)
- Determine the appropriate level of performance needed of your safety systems
- Help prevent over- or under-designing the system requirements to save your organization time and money

You Will Cover:

- Determination of the Appropriate Level of Performance Needed for Your Safety Systems
- Prevention of System Requirements Over- or Under-Design
- SIL Determination Hands-on Examples: 3-Dimensional • Risk Matrix • Risk Graph • LOPA • Modified (implicit) LOPA

Classroom/Laboratory Exercises:

- Multiple application exercises of SIL determination
- Students are encouraged to bring their own examples to cover in class

Students should bring a hand-held/scientific calculator to class.

Recommended Prerequisites:

- ISA Course EC50 or EC50E
- Must meet eligibility criteria for **ISA84 Certificate 2: ISA84 SIL Selection Specialist**, if applying for this certificate program

Course Details:

| | |
|-----------------------------------|-----------------------------|
| Course No.: | EC52 |
| Length: | 2 days |
| CEU Credits: | 1.4 (14 PDHs) |
| Course Price: | Contact Kenexis for details |
| Certificate Program Price: | Contact Kenexis for details |

This course is required for ISA84 Certificate 2: ISA84 SIL Selection Specialist.

Advanced Design and SIL Verification

Instructor-Led Training Course

Description:

This course focuses on more detailed design issues and further hands-on examples of system analysis/modeling. Students will be better able to perform system design and analysis, thus saving their companies time and money in optimizing system designs.

This course is required for the ISA84 Safety Instrumented Systems Certificate Program 3. You can register for the course only or for the certificate program which includes course and exam. If you are registering for the certificate program, you must complete an application and document eligibility criteria to sit for the certificate exam at least six (6) weeks prior to taking the course. Those who successfully complete this course and pass the exam receive the designation of ISA84 SIL Verification Specialist.



This course is required for ISA84 Certificate 3: ISA84 SIL Verification Specialist.

You Will Be Able To:

- Analyze any system technology and configuration to see if it will meet the required safety integrity level (SIL)
- Determine if existing systems are safe enough (or whether they need to be upgraded) and whether proposed systems will meet the performance requirements
- Determine the optimum manual test interval for any system, saving your company time and money by not over- or under-testing systems

You Will Cover:

- **System Modeling/Analysis Hands-on Advanced Examples:** Multiple Examples with Different Field Device Technologies
 - Configurations • Diagnostic Levels • Test Intervals • Common Cause Factors
- **Detailed Design Topics:** Fault Tolerance • Safe Failure • Fraction
 - Diagnostic Coverage • Confidence Limits • System Response to Faults • Using Devices for Control and Safety • Non Fail-safe Design Requirements • Interface Requirements

Classroom/Laboratory Exercises:

- Multiple application exercises of system modeling/analysis
- Students should bring a hand-held/scientific calculator to class.*

Recommended Prerequisites:

- ISA Course EC50 or EC50E
- Must meet eligibility criteria for **ISA84 Certificate 3: ISA84 SIL Verification Specialist**, if applying for this certificate program

Course Details:

| | |
|-----------------------------------|-----------------------------|
| Course No.: | EC54 |
| Length: | 2 days |
| CEU Credits: | 1.4 (14 PDHs) |
| Course Price: | Contact Kenexis for details |
| Certificate Program Price: | Contact Kenexis for details |

Applying for an ISA84 Certificate Program



Certificate 1: No application required. Register for the course and certificate program online or via phone.

Certificate 2 and Certificate 3: First, complete and send application, available online, to ISA at least six (6) weeks before the first day of your chosen course offering. ISA will email you to confirm that you meet the prerequisites to register for Certificate Program 2 or 3 at least four (4) weeks before the course start date. Then, register for course and certificate program online or via phone.

For more information visit [URL](#).

Renewal

Because these are certificates and not certifications, you will not have to renew your ISA84 Certificate(s); however, your certificate will only be considered current for three years. After your expiration date, you will not be able to claim you hold a current certificate; however, if you meet the requirements, you will be able to extend the “current” status of your certificate.

What are the requirements for extending the “current” status of my certificate?

Questions regarding extending your certificate’s “current” status can be addressed by sending an email to info@isa.org or calling ISA Customer Service at +1 919-549-8411.

Certificate vs. Certification Programs

Certificate programs are typically associated with mastery of specific course content and may or may not require work experience, while certification programs are based on a job analysis identifying specific knowledge, skills, and attributes to perform a specific job and require that successful candidates demonstrate identified knowledge, skills, and attributes beyond any educational program.

Learn more about ISA’s Certification Programs online: www.isa.org/certify.

ISA’s SIS Certificate Programs vs. Other Safety Recognition Programs

| ISA | CFSE | TÜV Rheinland |
|---|---|--|
| ISA84 Safety Instrumented Systems (SIS) Expert <ul style="list-style-type: none"> 5 years industry experience with <ul style="list-style-type: none"> 2 years PHA/SIL selection experience 2 years SIL verification (and/or other related) experience Take all three ISA SIS courses (totaling 8 days) on SIS fundamentals, SIL selection, and SIL verification (An 8-week online version of the fundamentals course is also available.) All three ISA exams required (each exam has 75 questions) | Certified Functional Safety Expert (CSFE) <ul style="list-style-type: none"> Combined 10 years experience and higher education 4 references Resume and experience (technical degree, publications, etc.) Preparatory <i>course not required</i> Exam required (1-day) | Functional Safety Expert (FSExp) <ul style="list-style-type: none"> 10 years experience and higher education 2 case studies 2 external references Resume and experience (technical degree, publications, etc.) <i>No exam required</i> |
| ISA84 SIS Fundamentals Specialist (ISA84 SFS) <ul style="list-style-type: none"> No experience required (2 years in process automaton and 2 years technical-related education recommended) No references required 4-day preparatory instructor-led course required (8-week online, instructor-assisted course option available) Exam required (2-hours, 75 questions) | Certified Functional Safety Professional (CFSP) <ul style="list-style-type: none"> 2 years experience 4 references Resume and experience (technical degree, publications, etc.) Preparatory <i>course not required</i> Exam required (1/2-day) | Functional Safety Engineer (FSEng) <ul style="list-style-type: none"> 3 years experience 4 references Resume (technical degree, etc.) 3- to 4-day preparatory course required Exam required (1/2-day) |
| Taking the ISA courses is required before taking the exams. Students have up to 3 months after a course (to study) before taking the online exam. | A preparatory course is not required to take either exam. | Taking an FSEng course is required before taking the exam (the next day). If someone fails the exam, they may only retake it after retaking the course. |
| ISA developed the ANSI/ISA-84.00.01-2004 standards on SIS, and a team of ISA experts created the ANSI/ISA84 training courses and the exams. ISA courses are standardized. There is one set of prices for the ISA courses and exams. | Available courses differ by course provider, but are reviewed by the CFSE Boards. The CFSE Boards create the exams (which others may proctor). There is <i>only one exam for each discipline</i> . There is one cost for each exam and certification. | Experts create and teach the courses and create their own exams. Courses and exams will differ by provider, but are reviewed by TÜV. TÜV sets <i>minimum pricing levels</i> for courses and for exams. |
| Candidates must submit their credentials <i>before</i> taking a course and exam. | Candidates must submit their credentials <i>before</i> taking the exam. | Candidates submit their credentials <i>after</i> taking the course and exam, which means they may not meet the requirements even if they pass the exam. |

ISA EC50 Instructor-Led Training Course in Abu Dhabi, United Arab Emirates (5th December 2011 – 8th December 2011)

Simply complete this registration form and return it by either fax or email.

Name: Mr./Ms. _____

Company Name: _____

Address: _____

Phone: _____ Fax: _____

Email: _____

PLEASE NOTE: Full Payment is required prior to the commencement of the training course.

I wish to pay by: Check Company Purchase Order Number: _____

Please charge my: MASTERCARD VISA

Card Number : _____ Expiration Date: _____

Cardholder's Name: _____

Cardholder's Signature: _____

Venue: Crowne Plaza Abu Dhabi, PO Box 3541, Hamdan Street, Abu Dhabi, UAE

Food & Beverages: All lunches, morning and afternoon refreshments will be provided.

Registrations: We encourage you to register early as spaces are limited to a maximum of 20 participants. By Fax: +1-614-451-2643; By Email: victoria.schuler@kenexis.com; By Mail: Kenexis, 3366 Riverside Drive, Suite 200, Columbus, OH 43221, USA



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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).