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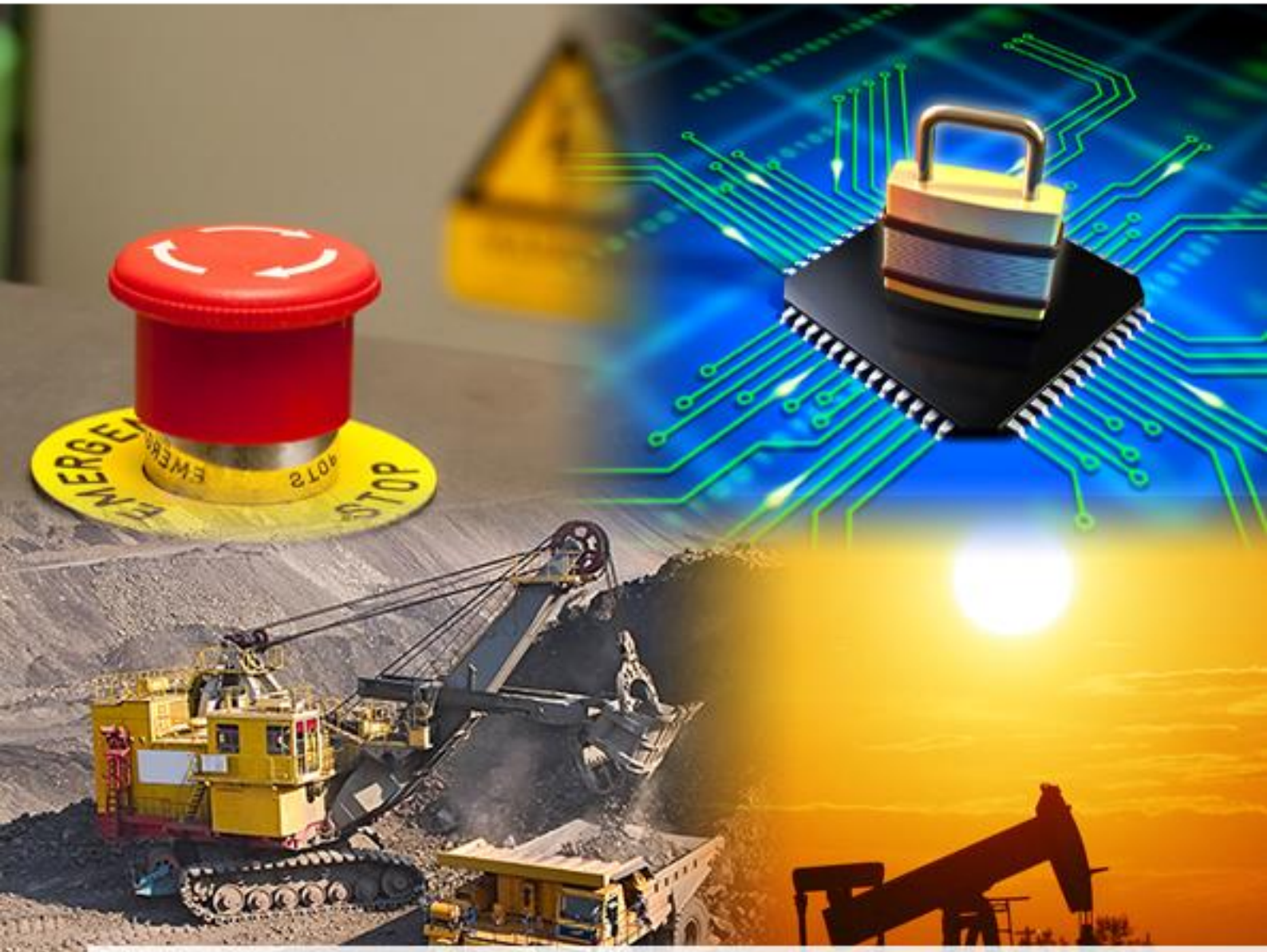

SAFETY INSTRUMENTED SYSTEMS

XPRTU™

(Software Based Training)

Thousands of process facilities (including Oil Platforms, Refineries, Chemical plants, Tank Farms, Power Plants, Nuclear facilities, etc), all over the world use Safety Instrumented Systems (SIS for short), to protect people, equipment and the environment from catastrophe. During recent years, various countries and regions have made it almost mandatory to use these systems, to prevent accidents and mishaps.

Unfortunately however, knowledge about Safety Instrumented Systems is perceived by many people to be a hidden art, that only a few chosen people know (or are capable of knowing). This is simply not true.

By using this Abhisam easy to understand software based training, any technical professional who has work experience and/or qualifies to work in the above industries can easily learn all about Safety Instrumented Systems.

This software is designed to make the learning experience comfortable and easy. Everything is explained in easy to understand terms, with plenty of graphics, interactive **animations and simulations, as well as real-life examples.** Everything that you need to know about Safety Instrumented Systems, put together, in an easily digestible form, stripped of all the complexity, and extremely useful to impart skills that you can actually use in your work.

This software is NOT a rehashed power point presentation. It is a full fledged e-learning software with interactive animations, simulations, graphics and text. It also has many worked out example problems, to help understand design, operation & maintenance/testing of Safety Instrumented Systems.

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SAFETY INSTRUMENTED SYSTEMS

Key Features of the SIS XPRTU™

These are some features of the SIS XPRTU that you will not find anywhere else.

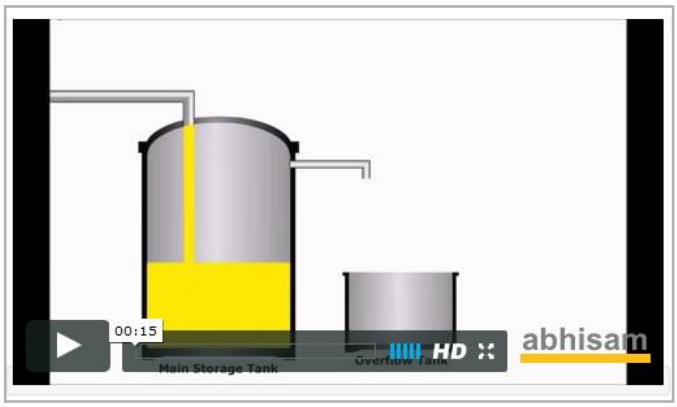
- No boring lectures by anybody
- Interactive Real Life animations & Simulations
- Situational videos
- Easy to understand text and graphics
- Self Assessment Test
- Real Case Studies with realistic data

Customer Speak

" I have worked in the International Oil & Gas industry for more than 30 years. I have used and recommend Abhisam products to all engineers & technicians in our industry. No praise is too great! " John Longden, Petroleum Training Institute, UK

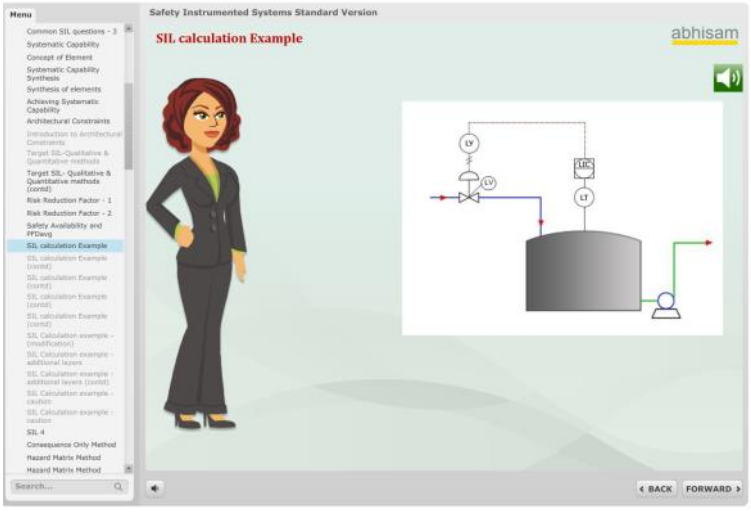
Animations & Simulations

Learn Safety Instrumented Systems via realistic animations and simulations. Below is a low resolution screenshot of what you will get in the actual software. This is just one example, there are many more in the SIS XPRTU.



Real Life Problems

Learn from actual real life examples of implementing Safety Instrumented Systems in industrial facilities. These include Safety Integrity Level determination, SIL calculations, verifications - everything is explained in an easy to understand manner. The ease of understanding of SIS after you go through the worked examples will amaze you. All the complexity is stripped out.



Low-res screen grab

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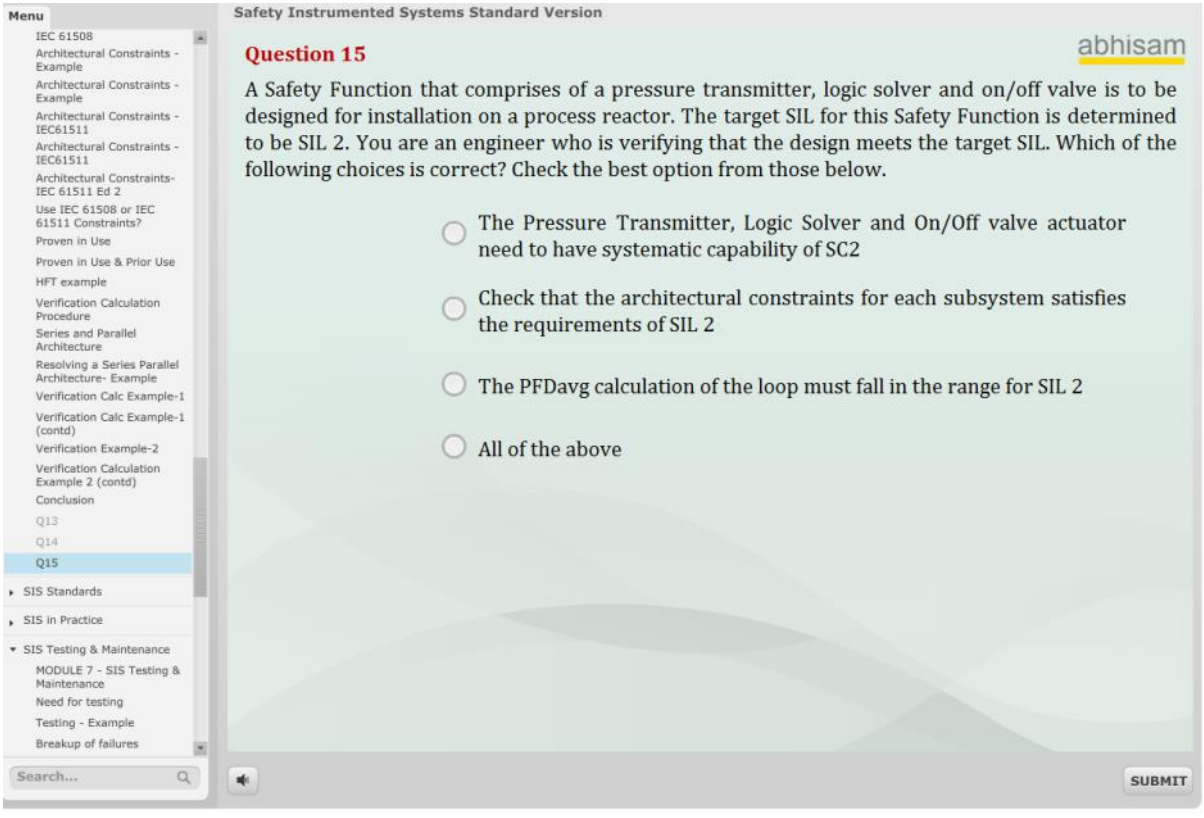
Situational Videos

Also get situational videos, like the one here that explains the need for proper SIL Determination

Self Assessment Test

Try the Self Assessment Test, that is included in the software, that helps you practice before taking the Certification Exam. Below is a low res screenshot of a sample question.



The software contents

The software has SEVEN modules as given below

1. Introduction to Safety Instrumented Systems (SIS for short)
2. Hazards, Risks & their analysis
3. Failures & Reliability
4. Safety Integrity Level
5. SIS Standards
6. SIS in practice
7. SIS Testing & Maintenance

Detailed contents

The detailed contents are given below :

MODULE 1 - Introduction to SIS

- What are Safety Instrumented Systems?
- Basic Ideas about SIS
- Functional Safety
- Instrumented Systems & Safety Instrumented Systems
- BPCS
- BPCS and SIS
- Safety Instrumented Function
- Safety Instrumented Function-2
- Safety Instrumented Function-3
- Emergency Shutdown Systems
- Need for a separate SIS
- Simulation exercise
- Learnings from the exercise
- Typical architecture
- Integrated BPCS & SIS
- Integrated BPCS & SIS-2
- Examples
- Differences between BPCS & SIS

MODULE 2 - Hazards, Risks & their analysis

- Hazards & Risks
- Types of hazards- Fire & Explosions
- Types of hazards-Toxic Material
- The Safety Lifecycle
- Steps in analysis
- Preliminary Hazard Analysis
- HAZOP
- HAZAN
- Consequence Analysis
- Risk
- Risk graph
- Risk Reduction
- Risk Reduction-2
- The ALARP principle
- Risk Reduction in process plants
- Risk Reduction explained
- Risk reduction using an SIF
- Risk reduction using an SIF
- Layers of Protection
- Layers of Protection in the process industries
- Preventive & Mitigative layers
- Safety Requirement Specification
- Safety Requirement Specification-2
- Diversity

MODULE 3 - Failures & Reliability

- Failures
- Types of failures
- Types of failures-2
- Types of failures-3
- Dangerous & Safe failures
- Dangerous & Safe failures
- Safe Failure Fraction
- SFF Pie Chart
- No effect and No part Failures
- SFF manipulation
- Proof Test Interval
- Diagnostic Coverage
- Common Cause Failures
- Common Cause Failures-2
- CCF Example
- Diversity
- Reliability
- Failure Rate
- MTTF
- MTTR
- MTBF
- Failure Data
- Software Reliability & fault injection
- Reliability Block Diagrams
- Reliability Block Diagrams-2
- Reliability Block Diagrams-3
- Redundancy and Reliability
- Fault Tree Analysis
- Fault Tree Analysis Example- 1
- FTA and RBD
- Fault Tree Analysis Example-2
- Fault Tree Analysis Example-2
- Fault Tree Analysis-Probabilities
- Event Trees
- Event Tree Components
- Event Tree Analysis Example
- Fail-Safe and Fail Danger modes
- FMEA
- FMEDA
- FMEDA report
- How to use the FMEDA report
- Example FMEDA report
- Redundancy
- Redundancy and Voting
- Voting Systems 1oo1
- Voting Systems 1oo2
- Voting Systems 1oo2D
- Voting Systems 2oo2
- Voting Systems 2oo3
- Spurious Trips
- Concept of Demand
- Demand in a plant
- Low Demand & High Demand
- PFD
- PFDavg

Customer Speak

"I am working in one of the world's leading EPC companies, engaged in the Oil & Gas industry. I have purchased the Safety Instrumented Systems, Hazardous Area Instrumentation e-learning courses and the ebook Practical Guide to Hazardous Area Classification. All of them are excellently crafted, the best available online, with excellent support via email.

I appreciate the good work done by Abhisam and hope that they do come out on more such courses, especially on Control Valves."

Deepak Kumar Jha, Engineers India Ltd

New Delhi, India

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MODULE 4 - Safety Integrity Level

- Introduction to Safety Integrity Level
- What SIL is not
- Is SIL applicable to me?
- SIL 1 to SIL 4
- SIL for Demand Mode
- SIL for Demand Mode-Example
- SIL for Continuous/High Demand Mode
- The SIL process
- Common SIL questions
- Systematic Capability
- Concept of elements
- Synthesis of elements
- Target SIL-Qualitative & Quantitative methods
- Risk Reduction Factor-1
- Risk Reduction Factor-2
- Safety Availability and PFD_{avg}
- SIL calculation Example
- SIL calculation Example
- SIL calculation Example (contd)
- SIL calculation Example (contd)
- SIL Calculation example-(modification)
- SIL Calculation example-additional layers
- SIL Calculation example-caution
- Consequence Only Method
- Hazard Matrix Method
- Hazard Matrix Method-(contd)
- Hazard Matrix Method-Example
- Risk Parameter Graph-1
- Calibrated Risk Graph-1
- Calibrated Risk Graph-2
- LOPA method
- Conducting a LOPA
- More about LOPA
- LOPA Example
- LOPA Example contd
- LOPA Example contd 2
- LOPA Example contd 3
- Target SIL & SIL verification
- SIF design process
- PFD of simple loop
- SIL verification example-1
- SIL verification example-2
- SIL verification for complex loops
- Markov Modeling-1
- Markov Modeling-2
- Markov Modeling-3
- Markov Modeling-4
- Simplified Equations
- Use of Simplified Equations-Example
- Architectural Constraints
- Architectural Constraints IEC 61508
- Hardware Fault Tolerance-IEC61508
- Hardware Fault Tolerance (contd)
- Architectural Constraints-Example
- Hardware Fault Tolerance-IEC61511
- Hardware Fault Tolerance example
- Conclusion

MODULE 5 - SIS Standards

- Introduction to Standards in SIS
- AK 1 to AK 8
- IEC Standards
- IEC 61508
- IEC 61508:2010
- E/E/PE systems
- Certified Devices
- No Part & No Effect failures
- IEC 61511-Basics
- IEC 61511 Ed 2
- Relationship between IEC 61508 & IEC 61511
- ISA S84 Background
- ISA S84 Differences
- Security

MODULE 5 - SIS Standards (contd)

- Functional Safety Management
- Where to get Standards
- What Standards apply to me?
- Architectural Constraints
- Changes in tables

MODULE 6 - SIS in practice

- Components of the Safety Loop
- Types of logic Solvers
- Hardwired logic solvers-Trip amplifiers
- Hardwired logic solvers-Gates
- Safety Relays-Electromechanical
- Safety Relays-Electromechanical-2
- Safety Relays-Electromechanical-3
- Safety Relays-Electromechanical-4
- Safety Relays-Electronic
- Safety Relays-Electronic-2
- Programmable Logic Solvers
- Safety PLCs & General Purpose PLCs
- Safety PLC Design Techniques
- Fault Diagnostics
- Safety PLCs- Inputs
- Safety PLCs-Processors
- Safety PLCs- Outputs
- Safety PLCs-Software
- Safety PLCs-Software-2
- Safety PLCs-Software-Design
- Safety PLCs-Voting architecture
- Safety PLCs-TMR
- Safety PLCs-QMR
- Safety PLCs-Interface to BPCS
- Safety Networks-1
- Safety Networks-2
- HIPPS

MODULE 7 - SIS Testing & Maintenance

- Need for testing
- Testing-Example
- Breakup of failures
- Testing the components of a SIS
- Testing Sensors & Transmitters
- Testing Logic Solvers
- Testing valves
- Valve Testing-Bypass method
- Partial Stroke Testing
- Partial Stroke Testing-ISA method
- Valve Testing- Mechanical Stoppers
- Valve Testing-Smart Positioner method
- PST-Advantages & Disadvantages
- Testing and PFDavg
- Security Assessment

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Self Assessment Test

This self-assessment test helps learners evaluate their own knowledge about **Safety Instrumented Systems**. The test consists of several questions.

Certification Exam

After completing the Safety Instrumented Systems e-learning software, the learner can take the Abhisam Online Certification Exam. Every learner will have a unique Login and password. Questions are of various types, pulled in from a large database developed by Abhisam. On passing, the learner earns a Certificate of Competency in Safety Instrumented Systems. The Certificate bears the unique ID number of the learner and can be furnished as a proof of training and competency in Safety Instrumented Systems to current and prospective employers and / or clients.
Every learner gets TWO free attempts to take the online exam. If additional attempts are required, then a re-exam fee will be applicable.
Enterprise customers get access to an additional mock exam for practice, before the actual certification exam, as part of the Advanced module.

Professional Development Hours (PDH)

This Safety Instrumented Systems e-learning XPRTU based course has 40 PDH (Professional Development Hours).

Sample Certificate


Certificate of Competency

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Abhisam is pleased to award this

Certificate of Competency

to

John Q. Public

(Learner ID No XYZ00102)

in

Safety Instrumented Systems

in recognition of his successful completion of the e-learning course and passing the online examination in the above subject

Course Contents

- Introduction to Safety Instrumented Systems (SIS)
- Hazards, Risks and their analysis
- Failures and Reliability
- Safety Integrity Level (including SIL Assessments and SIL Verification calculations)
- SIS Standards (IEC 61508, IEC 61511, ISA 584)
- SIS in practice
- SIS Testing and Maintenance

SAMPLE

Director

Date: XYZ

Abhisam Software, 8345 NW 6th St #9035 Miami FL 33166

www.abhisam.com

Low-res image

BADGES

Electronic Badges at no extra cost

Display your achievement badge on your LinkedIn profile easily.

In addition to the Certificate, after passing the online exam, learners also get an Electronic Badge from Abhisam via Credly. (Abhisam is a Verified Credly Badge issuer).
This badge can be added to your LinkedIn Profile.
Your badge and certification information will then appear under the Certifications section of your LinkedIn profile. The title of the achievement, will link to a verification page where additional information is available, including a longer description, evidence, the badge image and criteria for the accomplishment, details about the issuer, and validation of the achievement's authenticity. Thus your skill is easily verifiable by any third parties including potential clients, customers, employers and peers.
This is a great way to enhance your public profile regarding your skills and is available for all Abhisam customers free of cost!

You can also add your Badge to the LinkedIn feed, where you can announce your achievement to your LinkedIn connections.

Display your achievement badge to Facebook

Similarly you can post to Facebook, Instagram and other social media platforms easily via Credly.

Conformance to global standards - Mozilla Open Badge framework

Furthermore, Abhisam badges conform to the Mozilla Open Badge framework and can be easily added to your Mozilla back pack.

** Credly logo, LinkedIn logo, Mozilla Open Badge logos belong to the respective organizations.*

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Safety Instrumented Systems Demo

By now you have seen how detailed and comprehensive the software is. A brief demo of the Safety Instrumented Systems software can be viewed online at the Abhisam website. Please click **http://abhisam.com/free-trial-courses/** to do this.

AVAILABLE VERSIONS

The Safety Instrumented Systems e-learning software is available in three versions as outlined below.

Online Version (Windows, Mac or tablets)

Access is online through our web based Learning Management System, using a standard browser such as Internet Explorer or Mozilla Firefox. Access is for a period of ONE YEAR. This version includes one seat to take the online exam and certification.

Standard Download / Standard Online version

This version allows the learner to download and install the software on your own PC / laptop if Windows OS (XP, Vista, 7, 8/8.1 or 10) OR access the course on the Abhisam Learning Portal for a period of THREE YEARS. It also includes online exam and certification. Internet access is required for license activation at the time of installation & for periodic random license checks that happen in the background. The online exam must be taken within one year of purchase of the license.

Enterprise Version (Cloud based) OR via your SCORM/TinCan compatible LMS

This version is for organizations or enterprises who wish to train their employees / contractors in Safety Instrumented Systems. Every learner gets access to the Enterprise version of Safety Instrumented Systems on our Learning Management System via a standard browser such as Internet Explorer or Mozilla Firefox. The Enterprise version is available for groups of 10 or more learners. This is a subscription pricing model with a set price per year of access. Ideal for organizations, enterprises or universities. Every learner gets an Online Certification Exam Seat during the period of the subscription.

Nothing needs to be installed on the organizations servers or any learner's device, all access is via Internet.

Bonus modules, including the Mock Exam are available only in the Enterprise version.

This version can also be streamed to your own Learning Management System (LMS) if it accepts SCORM or TinCan content.

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VERSIONS

Feature	Online	Standard	Enterprise
All Modules	✓	✓	✓
Self Assessment Test	✓	✓	✓
Online Exam & Certification	✓	✓	✓
Access	Online access only	Download to any one PC/ laptop OR access online	Online access via our LMS or your SCORM/Tincan compatible LMS
License	One year (renewable)	Three Years (renewable)	One Year (renewable)
Devices	PC/Laptop/Mac/Tablet/iPad/ Mobile	Can be installed on any PC (Windows OS) OR accessed via any PC/laptop/Mac/ Tablet online	PC/Laptop/Mac/Tablet/iPad/ Mobile
Ideal for	Individuals	Individuals	Organizations

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