Functional Safety, Security, & Reliability
www.exida.com

CFSE / CFSP PROGRAM

exida Can Show you the Way

Certified Functional Safety Expert / Professional Program

EC 61508

"...ensuring that applicable parties involved in any of the overall E/E/PE or software safety lifecycle activities are competent to carry out activities for which they are accountable" - IEC 61508, Part 1, Paragraph 6.2.1 (h)

IEC 61511

"Persons, departments, or organizations involved in safety lifecycle activities, shall be competent to carry out the activities for which they are accountable." - IEC 61511, Part 1, Paragraph 5.2.2.2.

A number of industry experts including exida have developed a certification program to help ensure that personnel performing SIS safety lifecycle activities are competent. Exida certification is a good way to show standards compliance during internal audits of end-user facilities and equipment vendor development programs. Additionally, it is an effective way for engineering firms and system integrators to demonstrate, and for end-users to verify, the competency of contracted personnel who are performing safety lifecycle activities.

The certification process involves a review of the applicant's background and satisfactory completion of a proficiency exam. The background review includes a proof of completion of an applicable engineering curriculum and review of relevant professional experience. Successful applicants will receive a certificate of competency in one of the following disciplines:

Application Engineering in the Process Industry – Personnel who are involved in implementing safety instrumentation at end-user facilities and processes should be certified in application engineering.

Application Engineering in Machine Safety - Personnel who are involved in implementing safety instrumentation at end-user facilities and processes should be certified in application engineering.

Development Engineering, Hardware / Software – Personnel who are involved with the design of E/E/PES devices for use in safety applications should be certified in development engineering.

Safety Lifecycle Management – Personnel who are involved with scheduling, budgeting, and oversight of instrumented systems in safety applications should be certified in safety lifecycle management.

There are different certification exams corresponding to different categories of competency. Each of the tests contain multiple-choice questions, short answer questions, and case studies. The participant is required to successfully answer a percentage from each section and receive an overall score of 80%.

For more information on the exam, visit www.cfse.org

Certification and Training from exida

exida has developed a series of course specifically designed to prepare the student for a certification exam

Safety Engineering I – Risk Analysis, Requirements, and Design: This course provides an overview of Safety Engineering from the Risk Analyst, Process Safety Coordinator point of view. Covering in moderate depth, the first half of the safety lifecycle, the course explains risk analysis, requirements creation and management, SIL Determination, Layer of Protection Analysis, and basics of SIS design. This course should be attended by loss prevention professionals, process safety coordinators, plant risk analysts, control engineers or their management.

Safety Engineering II – Design, Verification, and Life Cycle: This course provides an overview of Safety Engineering from the Control Engineering, Maintenance Engineer point of view. Covering the second half of the safety lifecycle, the course covers the basics of risk analysis, and provides details of SIS Design, SIL Verification, Periodic Inspection Techniques, and Management of Change. This course should be attended by loss prevention professionals project engineers or their management.

Hazard and Risk Analysis: In this course, you will learn several qualitative techniques for identifying and assessing the hazards of process systems, equipment, and automation systems. These techniques including what if analysis, checklists, and failuremodes and effect analysis, are used in several examples designed to reinforce concepts build confidence, This course should be attended by loss prevention professionals, control engineers or their management.

Quantitative Risk Analysis: This course provides the student with a set of practical quantitative techniques for risk assessment. Using fault trees and event trees as the primary tool, several examples show how to evaluate relative importance of competing risks, More advanced topics include dependent failure analysis, common cause, failure rate data analysis and test and maintenance analysis.

Introduction to Consequence Analysis: Finding the risk posed by a process requires that both likelihood and consequence aspects be analyzed. The consequences of chemical hazards are often very hard to understand using qualitative techniques. This course introduces the student to a number of quantitative modeling tools available.

Layer of Protection Analysis / SIL Selection: Selection of safety integrity level (SIL) is a risk analysis problem. To make a selection, process risk without a safety instrumented system (SIS), tolerable risk and necessary risk reduction must be evaluated. Many companies need a method to do this that does not require a risk analyst. Layer of Protection Analysis (LOPA) is a method easy enough to be done by control engineers yet accurate enough for many applications. This course covers several methods for determining SIL.

Safety System Design Verification: In this course, you will learn basic safety instrumented system (SIS) design concepts including failure modes, consequences, and fault tolerant design techniques. Examples of these concepts will be used to demonstrate quantitative safety integrity level (SIL) verification. Fault trees and Markov models will be presented along with spreadsheet solutions to several problems.

Burner Management Systems: This course starts with a review of the NFPA, DIN/VDE, IEC, and FM standards that govern burner management systems (BMS) design in the U.S. The requirements of a BMS, based on standards, are then used to design an example BMS system. The details of the design and the design rational are presented so that students will understand how to expand the design into custom solutions often needed by particular boiler variations. This course should be attended by control engineers, safety engineers, and their management.

FMEA / FMEDA – Failure Modes, Effects, and Diagnostic Analysis: The Failure Modes and Effects Analysis technique has been in use for several decades and has proven to be one of the best methods of finding potential design flaws in a system. The Failure Modes, Effects, and Diagnostic Analysis technique is an extension used primarily in the analysis of safety critical electronic systems as part of the IEC61508 certification. This course teaches the basic techniques with several examples. Advanced techniques such as diagnostic circuits, protection circuits, and multiple operating modes are covered. This course should be attended by reliability engineers, safety engineers, safety equipment development engineers, and their management.

Introduction to Reliability Engineering: This course explains the fundamental concepts of reliability engineering. Taking a practical view, the course covers definitions, basic concepts, fault trees, r eliability block diagrams, Markov models, and methods used to solve system reliability models. Advanced techniques including fault tolerance, diagnostics, common cause, and software/human reliability are introduced. This course should be attended by safety engineers, control engineers, reliability engineers, and engineering management.

Introduction to IEC61508, International Functional Safety Standard: The IEC61508 standard for functional safety of electrical/electronic and programmable electronic systems was recently approved and released. This standard explains the concepts of safety integrity levels, the safety life cycle, and many details specified by world experts. The standard is comprehensively reviewed and explained.

Functional Safety Management: The functional safety management course reviews safety lifecycle implementation and explains the entire process needed to achieve cost effective safety in SIS equipment. Training, documentation, maintenance procedures, and operational considerations are explained.