

I samarbejde med TÜV Rheinland og Yokogawa giver Insatech dig muligheden for at tage et uddannelsesforløb, der efter bestået eksamen gør dig til:

SIL - TÜV Certified Functional Safety Engineer

Safety Instrumented Systems IEC 61508 / IEC 61511

Formålet med uddannelsen er at give alle ingeniører og teknikere, der er involveret i design, bygning, drift og/eller vedligehold af procesanlæg, den elementære og nødvendige viden om Functional Safety, baseret på de internationale standarder IEC 61508 og IEC 61511.

Standarderne beskriver, hvorledes du skal/kan vurdere et proces loop, og beregne om denne overholder de sikkerhedsnormer, der er opstillet for et givet anlæg eller enkelt loop.

Som deltager skal du have en relevant ingeniøruddannelse eller tilsvarende og min. 3 års praktisk erfaring med Functional Safety. (Spørgeskema skal udfyldes og godkendes af TÜV, inden deltagelse kan bekræftes. Spørgeskemaet fremsendes ved tilmelding.)

Tid og sted:

Kontakt Insatech for dato.

Pris: 22.000,- kr. pr. person (inkl. frokost) Prisen faktureres ved bekræftet tilmelding.

Antal deltagere: Minimum 5 og maximum 12 personer.

Tilmelding til: ahe@insatech.com

Du kan på de efterfølgende sider læse mere uddybende hvilke emner dette forløb indeholder, og er altid velkommen til at kontakte undertegnede med spørgsmål til uddannelsen.

Vi glæder os til at høre fra dig.

Med venlig hilsen



Annette Henriksen

Sales Administration

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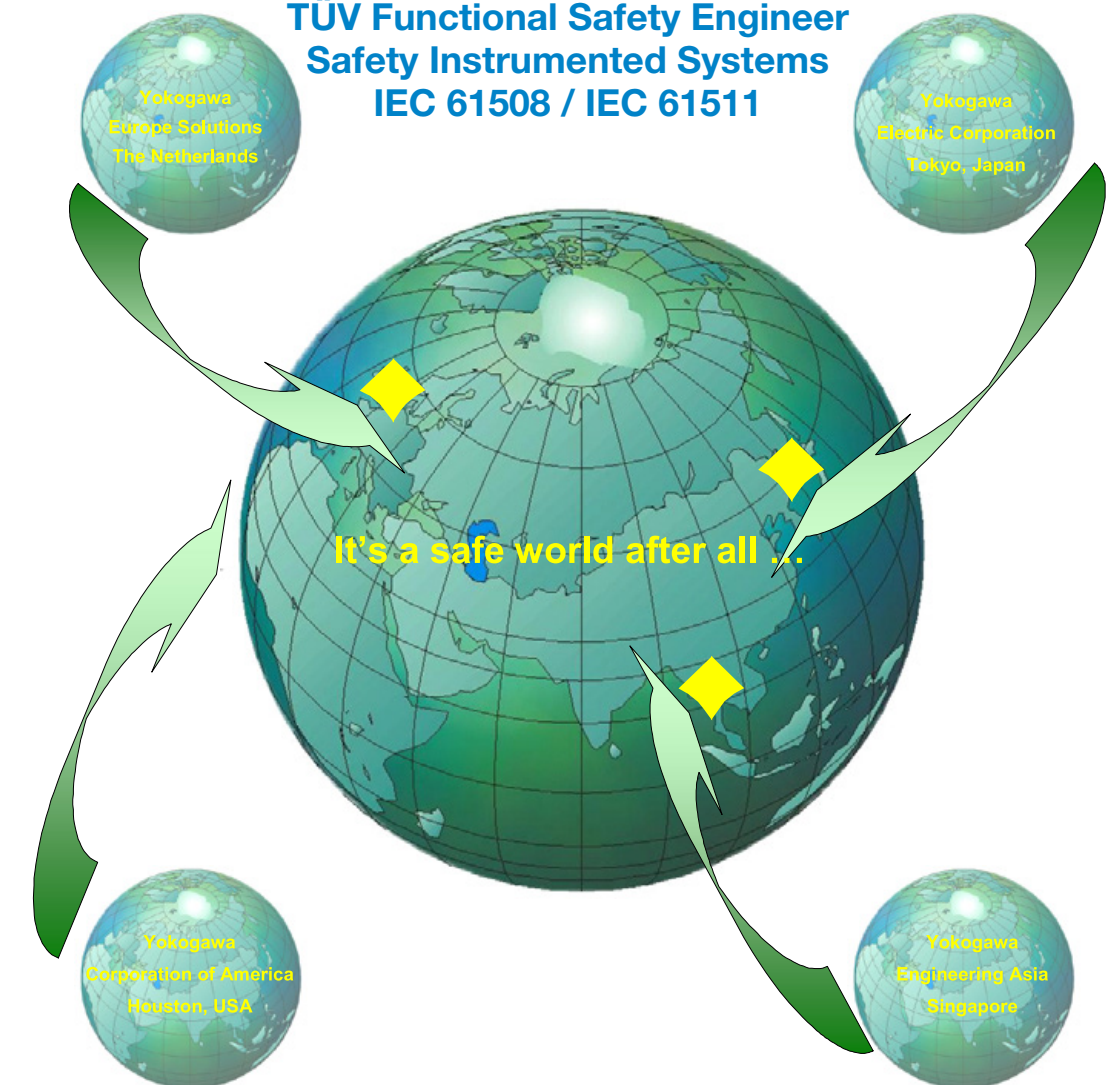


Training Course and Examination
TÜV Functional Safety Engineer
Safety Instrumented Systems IEC 61508 and IEC 61511

TÜV Rheinland Functional Safety Program

Yokogawa course provider for the Safety Training

TÜV Functional Safety Engineer
Safety Instrumented Systems
IEC 61508 / IEC 61511



A three and a half days training course with examination.

Students who pass the examination will receive the TÜV Rheinland certificate:

TÜV Certified FS Engineer



TÜV Certified Functional Safety Engineer – Safety Instrumented Systems

Course objective

The objective is to provide Instrument Engineers, Application Engineers, Site Engineers, Project Managers, Operation Engineers, Maintenance Engineers and all those who are involved in the design, realisation, maintenance and operation of safety systems with elementary and necessary knowledge about Functional Safety, based on the international standards IEC 61508 and IEC 61511.

Course information

Duration: 3.5 days

- The first two days is the training program: 09:00-12:00, 13:00-17:00
- Third day in the morning is the training program: 09:00-12:00
- Third day in the afternoon is the opportunity to ask questions (optional)
- Fourth day in the morning is the examination – 4 hours (maximum)

Price: DKK 22.000,- per participant

- Including course material
- Including fee for examination
- Including lunch

Participant eligibility requirements: in accordance with TÜV Rheinland Functional Safety Program

- A minimum of 3 years experience in the field of functional safety.
- Bachelor degree as a minimum or equivalent engineer level responsibilities status as certified by the employer.
- **Filled out eligibility forms must be sent in two weeks before training date at the latest.**

Trainers: three trainers have been certified as TÜV Functional Safety Expert

- Ton Beems, Yokogawa Europe
- Jeff Beijik, Yokogawa Europe
- Arian Slagt, Yokogawa Europe

Language: English

Training course: rules

- Participants will receive training material at start of the training, including hand outs of the ppt presentation and exercise sheets.
- At the end of each training day the applicant will receive the solutions of the group exercises of that day. It may be used for preparing for the examination.

Examination: rules

- Prerequisite to do the examination is that the applicant has to attend Yokogawa's training course "TÜV Functional Safety Engineer SIS".
- Pass score is 75%.
- There are 60 multiple (3) choice questions. At the most 2 good answers per question are possible, which is indicated if applicable. The answers will be valued as follows:

good answer	good answer	fault answer	fault answer	no answer	earned point
x	-	-	-	-	1
x	x	-	-	-	2
x	-	x	-	-	0
-	-	x	-	-	0
-	-	x	x	-	0
-	-	-	-	x	0

- There are 7 safety cases. The maximum points to be earned per case are mentioned.
- The examination questions and exercises will be handed over at the start of the examination.
- It is not allowed to bring any documents or (hand held) pc to the exam.
- It is not allowed to take any documents or notices from the exam.
- Check of the examination results will be done by two functional safety experts of Yokogawa.
- Counter check will be done by TÜV Rheinland.
- Discussion about the results is not possible.
- Applicants who succeed will receive their certificate from TÜV Rheinland, which may take some weeks.

Re-examination: for those who did not pass the examination

- Within one year after a failed examination, applicants may sign up once for another examination, free of charge.
- If applicants sign up for attending the training course again, they have to pay full course price.

TÜV Certificate: the validity of the TÜV certificate is 5 years

Prolongation of the TÜV FS Engineer certificate will be effected as follows:

- TÜV FS Engineer has to send an official letter from his/her employer or from a customer to TÜV Rheinland, in which his/her current and continuous work in the specified area of the certification (in this case Safety Instrumented Systems) is described and/or confirmed.
- The TÜV FS Engineer has to forward a paper (2-3 pages) to TÜV Rheinland describing projects he/she has carried out during the last 5 years of his/her professional life describing his/her experience in functional safety.
- The costs for the new TÜV FS Engineer certificate are Euro 300. Only after the TÜV FS Engineer has paid the costs to TÜV Rheinland the new TÜV FS Engineer certificate will be issued.
- The new TÜV FS Engineer certificate will be valid for another 5 years.
- TÜV Rheinland will send an e-mail to all TÜV FS Engineers whose certificate will expire, by end of the year preceding the expiration date. According information will be given on the website.
- TÜV FS Engineers who do not wish the prolongation of their certificate will be listed on the TÜV Rheinland website with the indication that their certificate is no longer valid.



Course agenda overview

Day 1: morning 09:00 - 12:00

- General Introduction

Module 1: Introduction to Functional Safety

- What is safety?
- Why safety?
- What is a safety system?
- Position of SIS in the total equipment under control

Module 2: International safety standards IEC 61508 and 61511

- The five main pillars of the standards

Day 1: afternoon 13:00 - 17:00

Module 3: HAZOP - SIF - SIL

- Hazard and risk assessment
- Determine Safety Instrumented Functions (SIF)
- Determine Safety Integrity Levels (SIL)
- Group exercises

Day 2: morning 09:00 - 12:00

Module 4: Safety Engineering

- De-energize To Safe state (DTS)
- Energize To Safe state (ETS)
- Redundancy
- Safety architectures
- Reliability modeling (Reliability Block Diagram – RBD)
- Group exercise on RBD
- Sensor validation
- Overrides, by-passes, inhibits
- Process safety time and system response time
- Logic Solver architectures

Day 2: afternoon 13:00 – 17:00

Module 5: Functional Safety Management

- Implications for organizations involved throughout the safety life cycle

Module 6: Failures and Hardware Fault Tolerance

- Random hardware failures and their modes
- Failure mode effect analysis
- Safe Failure Fraction (SFF)
- Hardware Fault Tolerance (HFT)
- Group exercise on HFT

Day 3: morning 09:00 - 12:00

Module 7: Common cause influences and other failure types

- The beta factor
- Systematic failures
- Human Failures

Module 8: Safety calculations

- Safety parameters
- Formulas
- Proof testing
- Group exercises on PFD/AVG calculations

Day 3: afternoon 13:00 - 17:00

Session for your questions

- The attendance of this session is optional
- Opportunity to do more exercises (optional)
- Time for self study

Day 4: morning 09:00 - 13:00

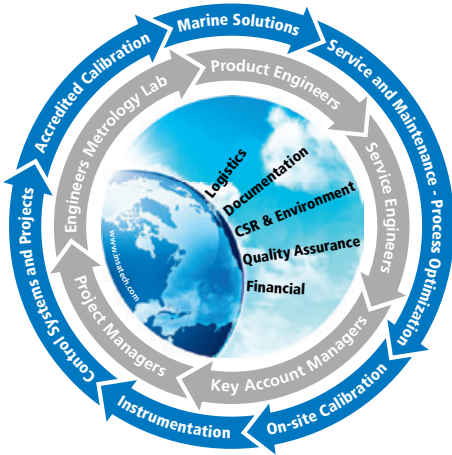
Examination

- 60 Multiple choice questions
- 7 Cases
- Those who have finished may leave earlier

About us

In 2005 Insatech A/S became a part of the Addtech Group of companies – Addtech AB, Stockholm, and since the company was established in 1989, we have had a positive business development. Today we are >60 employees.

Our mission is to be a trustworthy and competent partner, who supply technical solutions and engineering within process automation.



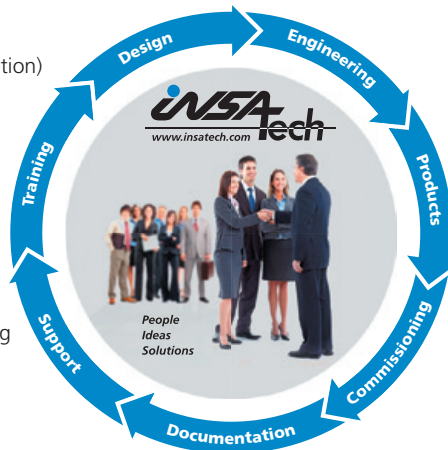
As a result of our longstanding partnership with some of the world's leading manufacturers within instrumentation and automation, we are able to provide a global service.

We work as a professional partner for our suppliers and for our customers – we believe in long relationships.

Our main markets are in the Pharmaceutical, Food, Energy, Marine/Oil & Gas Industry, which means we have a strong knowledge of the special applications, as well as the requirements for documentation in these areas.

Our main business areas:

- Process instrumentation and calibration equipment
- Automation, control and data acquisition
- System design, engineering and validation (DCS and Safety Systems)
- Service/maintenance and calibration (ISO 17025 accreditation)
- Site surveys and evaluation of process optimization based on better control practices
- Marine- and ship solutions, Cargo Management Systems
- Project Management
- Flow rigs/calibration rigs
- Special fittings
- Product enhancements
- Wireless solutions for monitoring and control
- Complete solutions including panels and commissioning
- Seminars and training



Conductivity calibration
Temperature calibration
Electrical calibration
Gas flow calibration

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Products and Services

Accredited Calibration:

Conductivity (Master meter)
Gas Flow

Analysis of gases:

Ammonia - NH₃
Moisture - H₂O
Oxygen - O₂
Carbon dioxide - CO₂
Carbon monoxide - CO
Methane - CH₄
Hydrochloric acid - HCl
Water - HO₂

Analysis of liquids:

Cell density
Density
Color
Conductivity
Concentration
Carbon dioxide - CO₂
Live Cells
Sound speed
NIR
Dissolved Oxygen
pH
Plato
Protein
Refractive index
TOC
Turbidity
Solids Viscosity

Analysis of solids:

Moisture
Fat
Protein

Calibration:

Flow
Temperature
Pressure
Simulators

Control and Systems:

DCS Systems
Shut Down & security systems
MES systems
Blending Systems
MID Solutions
SEEMP

Controllers:

Auto-tuning
Fuzzy-logic
Single- and multi-loop

Flow Measurement:

Bunker Control
Bunker Blending
Custody transfer
Coriolis mass flow
Differential - orifice/pitot tube
Flowswitch
Magnetic inductive
Mechanical
Rotameters V/A
Thermal mass flow
Ultrasonic (Clamp-on and in-line)
Vortex

Flow Measurement Solids:

Microwaves

Level Measurement:

Electromechanical
Displacement
Hydrostatic pressure
Capacitive
Conductive
Microwaves
Radar
Radiometric
Ultrasonic
Vibration

Pressure Measurement:

Absolute
Differential
Relative
Calibrators
Diaphragm seal
Level
Pressureswitch

Registration & Data Collection:

Data loggers
Data Acquisition Systems
GPRS - wireless transmission
Recorders
Paperless recorders

Single Use Technology:

Flow
Pressure
Temperature
UV
Conductivity
Live Cells
Turbidity

Services:

Calibration:

Flow - gases and liquids
Conductivity
pH
Temperature
Pressure

Accredited Calibration:

Conductivity
Gas Flow
Temperature
Electrical

Service:

Project Solutions
Control/Periodic maintenance
Services and inspections

Temperature:

Flow
Pressure
Temperature
UV
Conductivity
Live Cell Counting
Turbidity

Temperature:

Calibrators
Sensors
Thermoelements
Transmitters

Training:

Customized seminars and training session
www.instrumenteringskursus.dk

Valves:

Control Valves
Safety Valves

People - Ideas - Solutions