

# TÜV Rheinland Functional Safety Engineer Training

(Process Hazard & Risk Analysis)



**TÜVRheinland**<sup>®</sup>  
**Risktec**



Controlling risks within major hazard enterprises requires a robust process safety management (PSM) system and the experienced application of process hazard and risk analysis (PH&RA) techniques.

This PH&RA course is part of the TÜV Rheinland Functional Safety Programme. Participants who successfully pass the examination will receive a TÜV Rheinland Functional Safety Engineer (Process Hazard and Risk Analysis) certificate.

This 4 day course covers the fundamentals of PSM, hazard identification and risk analysis, evaluation and treatment, as well as focussing on the principal methods including HAZID, HAZOP, LOPA, FMEA, QRA and the increasingly popular bowtie analysis. It demonstrates how to apply theory in practice, using simple and more complex examples to illustrate key points. The course is considered essential for anyone who is involved in PH&RA.

Risktec Solutions, part of the TÜV Rheinland Group, is a leading authority on providing advice and technical support to clients operating in the major accident hazard sectors, including oil and gas, chemicals and nuclear sectors. Risktec's consultants have unparalleled technical knowledge and practical experience in identifying and providing process safety and risk management solutions in all the major hazard industries.

## At the end of the course you will be able to:

- Apply the most popular and internationally-adopted methods and tools for identifying and managing the risks associated with process-related hazards
- Actively participate in and give effective support during the whole process hazard and risk analysis approach
- Identify hazards and analyse risk, including applying the IEC 61882 HAZOP standard
- Relate the requirements of Functional Safety according to IEC 61508 / IEC 61511 to process hazards and risk analysis

## Who should attend?

- Process engineers, safety engineers and managers, instrument engineers and operations personnel, plant and operations managers
- Anyone accountable for the assessment and management of risks and hazards in the process industries
- Persons involved in management, engineering, operations and safety of process operations
- Persons with HAZOP study experience and a basic knowledge of loss prevention and safe working practice

This training will not be industry-specific, so we invite attendees from all major hazard industries, such as oil and gas, petrochemical, chemical, nuclear, transportation and mining.

**Where:** Risktec Solutions, 20 St Christopher's Way, Pride Park, Derby, DE24 8JY

**When:** 26<sup>th</sup> - 29<sup>th</sup> March 2019

# Programme Information

The purpose of the training course is to introduce the Process Hazard and Risk Analysis techniques routinely encountered in the identification and assessment of major accident hazards. The course covers the common risk assessment and treatment techniques deployed in process safety (technical safety) risk management. Each technique is reviewed and illustrated using relevant examples and exercises to reinforce the key principles.

The course comprises slides, several videos and, most importantly, 25 activities designed to enhance the knowledge and practical skills of participants. It provides a hands-on learning experience, with emphasis on the activities. Many of the slides provide backup content for reference purposes. All of the topics are covered during the course but the trainers flex the time spent according to the experience and wishes of the participants.

The course concludes on the afternoon of day 4 with a 3½ hour examination paper which comprises multiple choice questions and longer case study style questions. It is a closed book, closed notes exam. Use of calculators is allowed and one will be provided if required. Successful completion of the exam, by attaining a pass score of 75% or higher, registers the candidate as a TÜV Rheinland Functional Safety Engineer (Process Hazard and Risk Analysis), subject to satisfying the eligibility requirements.

The Risktec trainer is a TÜV Rheinland FS (PH&RA) Expert and is an active practitioner in the process sectors. He has extensive training experience and utilises accelerated learning techniques. All Risktec trainers draw heavily on their practical experience when delivering this training course and provide examples of the use of process hazard and risk analysis techniques as applied in the real world.

The following topics are covered over the first 3½ days:

### Introduction

Process Safety Management System (PSMS): 4 main focus areas... 20 elements...

- TR Functional Safety Programme
- Process Safety Management
- Process safety accidents
- Risk management process

### Risk identification

HAZOP process

- What if?
- HAZID study
- HAZOP study
- FMEA

### Risk analysis

Choice of approach

- Risk matrix
- Bowtie analysis
- Fault & Event Tree Analysis
- Physical Effects Modelling

### Risk analysis

The "LOPA onion"

- Quantitative Risk Assessment
- Layer of Protection Analysis
- SIL assessment
- Human factors in design

### Risk evaluation

Individual risk criteria

- Legislative regimes
- Risk criteria
- ALARP assessment
- Cost-benefit analysis

### Risk treatment

Risk treatment (recap)

- Risk control hierarchy
- Inherently safer design
- Process safety during facility lifecycle

### Risk managing

The risk management process

- Communication
- Consultation
- Monitoring
- Review

### Putting it all together

Course overview

- Selecting the right technique
- Planning PH&RA studies
- Facilitating workshop studies
- Reporting PH&RA studies

# Programme Information

## Course Leader

Andy Lidstone CPhys, MInstP, FS Expert (TÜV Rheinland, PH&RA)

Andy has over 20 years' experience in the field of safety and risk assessment and has worked in a number of industries, including oil and gas, mining, nuclear and defence, transport, manufacturing and chemical. Over the past 15 years, Andy's work has been predominately in the oil and gas industries, managing projects for facilities including refineries, mines, gas plants, drilling rigs and logistics operations. His expertise includes techniques such as bowties, fault and event tree analysis, failure modes and effects analysis, consequence modelling, QRA, hazard identification, preparation and roll-out of HSE cases and qualitative and quantitative risk assessments. Andy frequently provides training in these topics together with incident investigation training. Andy is a TÜV Rheinland Functional Safety Expert (PH&RA), and a lead teacher on Risktec's Postgraduate Education programmes in Risk & Safety Management.



## Course Support

Matt Beeson CMIOSH FS Eng (TÜV Rheinland)

Matt has 15 years' experience as a risk and safety consultant, working in oil and gas, rail, renewables, mining, leisure and manufacturing industries. He is a TÜV-certificated Functional Safety Engineer and has wide experience with a number of different hazard identification and risk assessment techniques (e.g. FTA, ETA, bowtie, HAZOP, IPF SIL assignment and verification, FME(C)A), in developing safety arguments and ALARP demonstrations. Matt frequently provides training on bowtie analysis as well as SIL assignment and verification and HAZOP.



## Eligibility Requirements

The following requirements must be met for candidates to attain the FS Engineer (TÜV Rheinland) certificate:

- a minimum of 3 years' experience in the field of functional safety, and
- University degree (Master's or Bachelor's degree in Engineering) or equivalent engineer level responsibilities status as certified by employer, and
- attendance at the course, and
- successful completion of the examination.

On meeting these requirements, candidates will be issued with the FS Engineer (TÜV Rheinland) certificate in electronic form as a PDF file by email.

The certificate is valid for 5 years. After that it can be renewed with TÜV Rheinland for a further 5 years against payment. Those who do not have the necessary functional safety experience may participate in the training as well as complete the examination. However, they will only be issued the FS Engineer (TÜV Rheinland) certificate if they pass the exam and once they have attained the necessary 3 years of experience in the area of functional safety.

## How to register

Complete the registration form and email it to [training@risktec.tuv.com](mailto:training@risktec.tuv.com). Participation is limited to 20 delegates and places will be allocated on a first come, first served basis.

## Pricing

The price for the 4 day course is **GBP 1,750** per person plus VAT. The cost includes training materials, refreshments and lunch, as well as registration fees with the TÜV Rheinland Functional Safety Programme.

This price is reduced to **GBP 1,675** per person plus VAT for bookings received before **28<sup>th</sup> January 2019**. This price also applies to additional delegates from the same organisation.

# Frequently Asked Questions

## Why should I seek a certificate in process safety?

Obtaining the certificate will create a stronger recognition of the role of the process safety engineer and reduce the uncertainty about what it involves. There is a shortage of skilled process safety professionals in what is a growing profession, so a formal certificate that recognises your expertise can help improve your career prospects and increase your remuneration by differentiating yourself from others. Gaining the certificate demonstrates your commitment to learning, with the ability to think creatively in order to solve complex process safety and risk problems.

## Why should I become a TÜV Rheinland Functional Safety Engineer?

Over 10,000 engineers have participated in training courses and are holders of the Functional Safety Engineer (TÜV Rheinland) certificate. The TÜV Rheinland Functional Safety Programme is the only worldwide extended vocational training programme in the area of functional safety where knowledge and competencies are approved by a third neutral party and where certificates are issued. Many organizations are increasingly stipulating that studies such as LOPA and SIL classification are led by TÜV Rheinland FS engineers or equivalent.



## How does this Process Hazard & Risk Analysis certificate relate to the Safety Instrumented Systems certificate?

Both the Process Hazard & Risk Analysis (PH&RA) certificate and the Safety Instrumented Systems (SIS) certificate fall under the same TÜV Rheinland Functional Safety Programme. The difference between the PH&RA and SIS certificates is simply the content studied and examined. The SIS certificate focuses on understanding and applying the standards IEC 61508 and 61511 for electrical, electronic, programmable electronic (E/E/PE) safety systems. The PH&RA certificate focuses on applying the principles of process hazard and risk analysis within the context of process safety management, noting the relationships with IEC 61508 and 61511 where they exist, but considering the full range of barriers for controlling risk, whether engineered systems, procedural controls or human intervention.

## Why should I do this training with Risktec?

Risktec is respected as a leading safety and risk management consulting and education company, with some of the world's most impressive companies as clients. Enrolling on this course ensures that your learning is relevant to industry and the situations you are likely to encounter in the real professional world. You will gain access to Risktec's experienced consultant-trainers, as well as the opportunity to network and interact with other delegates.

## How hard is the examination?

The exam is a professional exam and is designed to test the application of knowledge rather than simply recalling facts. As such the examination must reflect a level of difficulty which demonstrates the high quality of a qualified risk professional. All of the multiple choice questions must be answered and they encompass the full range of topics covered by the course. You may select which of the longer questions to answer from a larger set of questions. This allows you to focus on those topics that you are most experienced in. The exam recognises that professionals often specialise and that not everyone can be highly experienced in all techniques and their application.

## Can I refer to the course notes during the exam?

No, it is a closed book, closed notes exam. A calculator is required and one will be provided if you forget to bring yours. It is a professional exam and so any inappropriate communication between examinees, as well as the use of any books, notes or mobile phones, will result in disqualification at the discretion of the invigilator.

## What do I get when I pass the exam?

You will receive a FS Engineer PH&RA (TÜV Rheinland) certificate from TÜV Rheinland, Germany, which will be valid for 5 years. After that it can be renewed with TÜV Rheinland for a further 5 years against a reference letter from your employer and payment of a fee. TÜV Rheinland will issue you with a unique ID and publish your name on its website. You can use the title FS Engineer (TÜV Rheinland) on your business card and within the signature on your emails, etc.

## What happens if I fail the exam?

You can retake the examination after at least six months have passed but this will incur an additional fee.

# Registration Form

**Where:** Risktec Solutions, 20 St Christopher's Way, Pride Park, Derby, DE24 8JY, UK

**When:** 26<sup>th</sup> - 29<sup>th</sup> March 2019

## Attendee Registration Details

First name: \_\_\_\_\_ Surname: \_\_\_\_\_

Company: \_\_\_\_\_ Job Title: \_\_\_\_\_

Address: \_\_\_\_\_

Postcode: \_\_\_\_\_ Country: \_\_\_\_\_

Phone: \_\_\_\_\_ Mobile: \_\_\_\_\_

Email: \_\_\_\_\_

Course: TÜV Rheinland Functional Safety Engineer (Process Hazard & Risk Analysis) Certificate

**Your data protection:** The Risktec group will endeavour to process your personal data lawfully at all times and in accordance with international best practice, especially the European Union's General Data Protection Regulation (GDPR). For further details, please see our [Privacy Policy](#) on the Risktec website.

## Payment Details

### Which person or organisation will pay your fees?

- Self  
 Other

If other, please provide details of the person responsible for arranging your fees:

Full Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

E-mail: \_\_\_\_\_

### Payment method:

- Electronic funds transfer  
 Credit card (only in GBP)

### Currency:

- GBP  
 EUR  
 USD

**Payment deadline:** 26<sup>th</sup> February 2019. The course will be confirmed by 5<sup>th</sup> March 2019.

### Cancellation Policy:

Once registration has been submitted and processed, no refund of monies is possible. Risktec Solutions reserves the right to cancel the course at any time. In such circumstances the monies paid to Risktec will be refunded. Please see Risktec's Training & Education Terms and Conditions for more details.

### Registration:

Please complete the registration form and email it to [training@risktec.tuv.com](mailto:training@risktec.tuv.com).

### Registration Confirmation:

You will receive a preliminary confirmation via email upon receipt of this registration form.

An Eligibility form will be provided and must be completed and handed to the Risktec trainer before the exam day.