# Risk & Safety Management Courses

## Cross-sector

<table>
<thead>
<tr>
<th>Course</th>
<th>Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowtie Risk Management</td>
<td>1,2</td>
</tr>
<tr>
<td>BowTieXP Software (Basic &amp; Advanced)</td>
<td></td>
</tr>
<tr>
<td>Business Continuity Management (BCM)</td>
<td></td>
</tr>
<tr>
<td>Culture, Behaviour &amp; Competency</td>
<td>1,2</td>
</tr>
<tr>
<td>Emergency Response &amp; Crisis Management</td>
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</tr>
<tr>
<td>Enterprise Risk Management (ERM)</td>
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<tr>
<td>Environmental Risk Assessment</td>
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<tr>
<td>Fault Tree and Event Tree Analysis</td>
<td>2</td>
</tr>
<tr>
<td>Functional Safety of Safety-Related Systems</td>
<td>2</td>
</tr>
<tr>
<td>Hazard Identification</td>
<td>1,2</td>
</tr>
<tr>
<td>HAZOP Study</td>
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<tr>
<td>HSE Management Systems</td>
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<tr>
<td>HSSE Leadership for Managers</td>
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<tr>
<td>HSSE Leadership for Supervisors</td>
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<tr>
<td>HSSE Risk Management for Managers</td>
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<tr>
<td>Human Factors in Design &amp; Operations</td>
<td>1,2</td>
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<tr>
<td>Incident Investigation &amp; Analysis</td>
<td>1,2</td>
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<tr>
<td>Investigator 3 Software</td>
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<tr>
<td>Layers of Protection Analysis (LOPA)</td>
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<tr>
<td>Performance Monitoring, Auditing and Management Review</td>
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<tr>
<td>Principles of Risk Management</td>
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<tr>
<td>Project Risk Management</td>
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<tr>
<td>Reliability, Availability &amp; Maintainability Analysis</td>
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<tr>
<td>Research Methods in Risk &amp; Safety Management</td>
<td>1</td>
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<tr>
<td>Risk Analysis</td>
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<tr>
<td>Risk Reduction &amp; ALARP</td>
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<tr>
<td>Root Cause Analysis</td>
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<tr>
<td>Safety/HSE Cases</td>
<td>1,2</td>
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<tr>
<td>Workplace Safety</td>
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## Asset & Gas

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Asset Integrity Risk Management</td>
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<tr>
<td>Engineered Risk Control Systems (Oil &amp; Gas)</td>
<td>2</td>
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<tr>
<td>Oil &amp; Gas Lifecycle Hazards and Risks</td>
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<tr>
<td>Physical Effects Modelling</td>
<td>1,2</td>
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<tr>
<td>Oil &amp; Gas and Process Industry QRA</td>
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<tr>
<td>Oil &amp; Gas and Process Industry Risk Studies</td>
<td>2</td>
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<tr>
<td>Process Hazard Analysis (PHA)</td>
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<td>Process Hazard &amp; Risk Analysis</td>
<td>3</td>
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<tr>
<td>Process Safety Management in Design &amp; Operations</td>
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## Nuclear

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Engineered Risk Control Systems and Performance (Nuclear)</td>
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<tr>
<td>Implementation of a Regulatory Regime</td>
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<tr>
<td>Nuclear Lifecycle Hazards and Risks</td>
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<td>Nuclear Probabilistic Safety Assessment (PSA)</td>
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<tr>
<td>Nuclear Reactor Basics</td>
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<tr>
<td>Nuclear Reactor Safety Principles</td>
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<tr>
<td>Principles of Regulatory Systems</td>
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<tr>
<td>Radioactive Waste Management and Decommissioning</td>
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<tr>
<td>Radiological Protection</td>
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## Rail

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<th>Course</th>
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<tbody>
<tr>
<td>Common Safety Method</td>
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<tr>
<td>Rail Industry Hazards &amp; Risks</td>
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<tr>
<td>Rail Safety Analysis</td>
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## Maritime

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<th>Modules</th>
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<tbody>
<tr>
<td>US MARAD-accredited CVSSA</td>
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<tr>
<td>Management of Disruptive Passengers</td>
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<tr>
<td>Maritime Risk Management</td>
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<tr>
<td>Port Facility Security Officer (PFSO)</td>
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## Renewables

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<tr>
<td>Offshore Wind Farm Safety Assurance</td>
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## Qualifications:

1. Available as a Postgraduate Module (additional modules can be incorporated into corporate programmes)
2. Available as a TÜV Rheinland Risktec CPD
3. TÜV Rheinland Functional Safety Engineer (PH&RA) certificate
Asset Integrity Risk Management

What’s the purpose?
The purpose of the course is to provide an in-depth understanding of the ways to manage major incident risk throughout the asset lifecycle, from concept selection through operations to decommissioning. The course walks through the essentials of risk as a concept, and explains the processes and tools that companies are using today to prevent major incidents. Industry case studies are used to illustrate key issues.

Who is this for?
Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?
- Preventing major incidents by managing barriers
- Assuring plant performance
- Assuring people performance
- Assuring processes performance
- Reducing risk to As Low As Reasonably Practicable (ALARP)

After completing the module you should be able to:
1. Analyse the asset integrity risk management process throughout the asset lifecycle
2. Analyse the importance of assuring the integrity of engineered barriers (plant), competency of key personnel (people) and quality of procedures (processes) to prevent major incidents
3. Justify the approaches that are used to effectively reduce risks as low as reasonably practicable (ALARP)

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<tr>
<th></th>
<th>Postgraduate</th>
<th>Attendance only</th>
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<tbody>
<tr>
<td>Hours</td>
<td>80</td>
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<tr>
<td>Delivery Methods</td>
<td>Face-to-face</td>
<td>Distance learning</td>
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<td>2 days, followed by assessment</td>
<td>8 weeks duration</td>
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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.

What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
Bowtie Risk Management

What’s the purpose?
Bowtie analysis (also known as barrier diagrams) is an increasingly popular approach to help manage risk. This module introduces the bowtie methodology and examines in detail the various bowtie analysis components. The module also provides a critical review of the method’s benefits, limitations and practical uses, with hands-on practice at applying the technique.

Who is this for?
Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?
- Introduction to risk assessment and bowties
- The bowtie method
- Assuring barrier integrity
- Effectiveness and ALARP for bowties
- Benefits and practical uses of bowties
- Facilitating bowtie workshops
- Bowtie software tools

After completing the module you should be able to:
1. Analyse hazard scenarios by applying the bowtie method and designing a bowtie diagram
2. Develop integrity assurance for bowtie barriers
3. Devise risk acceptance criteria for hazards in bowties

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec modules: Principles of Risk Management; Hazard Identification.

risktec.tuv.com
training@risktec.tuv.com
+44 (0)1925 611200
What’s the purpose?
The purpose of this module is to enable students to effectively use the BowTieXP software in support of a bowtie analysis. It is expected that students will have prior knowledge of the bowtie method either from industry experience or from attendance on the recommended prior study.

Who is this for?
Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?
- Summary of the bowtie approach
- Introduction to BowTieXP and where it fits in
- Creating a new database / opening an existing database
- Creating a new bowtie, editing an existing bowtie, copying and pasting
- Creating activities and elements
- Linking controls to critical roles
- Creating reports and printing professional reports
- Shortfalls and remedial actions, review and sign-off
- Benefits and practical uses

After completing the module you should be able to:
1. Understand the quality of data to be input into a completed fit-for-purpose bowtie
2. Effectively use the BowTieXP software in support of a bowtie analysis including linking of bowties to supporting tasks, equipment, documentation, etc
3. Use the software to produce reports and other forms of output.

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<th>Hours</th>
<th>Face-to-face</th>
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<tr>
<td>7.5 - 15</td>
<td>1 day (basic), 2 days (advanced)</td>
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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
What’s the purpose?
The purpose of the course is to provide knowledge and understanding of Business Continuity Management (BCM) and the role that this plays in organisations of various sizes in readiness to face threats which would impact continued operation. This module includes business input reviews, continuity plan development and implementation and incident control management.

Who is this for?
Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?
- Introduction to Business Continuity Planning
- Business Continuity Planning process
- Risk assessment and analysis
- Business input reviews
- Contingency and recovery
- Business Continuity Plan development and implementation
- Incident Control Management

After completing the module you should be able to:
1. Critically review the internal and external threats which impact on business operations, and undertake a business risk analysis
2. Design a Business Continuity Plan for their organisation
3. Justify the BCP process and illustrate implementation barriers in its execution

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
Common Safety Method for Risk Evaluation and Assessment

What's the purpose?
The course provides an overview of the Common Safety Method for Risk Evaluation and Assessment and practical training on implementation in engineering rail projects. It provides background on approaches to the application of CSM for legal compliance. This involves studying the industry regulatory regimes and case studies applying to UK rail projects, and developing an understanding of the risk assessment process for all changes to the railway.

Who is this for?
Managers, engineers and HSE professionals as well as individuals new to the rail industry who require an overview of the industry’s risks.

What does it cover?
- Introduction to Risk Management
- CSM Overview, Context and Significance Decision
- Implementation of CSM.

After completing the module you should be able to:
1. Demonstrate expertise in safety management using key terms such as “hazard”, “consequence”, and “risk”
2. Understand Tolerability, ALARP and compliance with EU and UK legislation
3. Evaluate the significance of a change and the interaction with Hazard Identification techniques
4. Understand the elements of the Common Safety Method Risk Evaluation and Assessment process.

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<th>Hours</th>
<th>Delivery Methods</th>
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<tbody>
<tr>
<td>Risktec CPD</td>
<td>15</td>
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<td>1 day</td>
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</table>

If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.

What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management.

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+44 (0)1925 611200
What’s the purpose?
The purpose of this module is to provide the theory and practice that underpins safety culture and related workplace behaviour, as well as managing competency. It aims to promote consideration, discussion and evaluation of the inter-connection between culture, behaviour and competency and their relative importance within the workplace. The module promotes the application of this knowledge in workplace situations and highlights the importance of the topic in the field of risk and safety management.

Who is this for?
Managers, HSE advisors and risk management practitioners.

What does it cover?
- Competency management
- Training and resourcing
- Organisational culture
- Human behaviour
- Organisational change management
- Examples of major accidents / accident causes

After completing the module you should be able to:
1. Determine and justify the elements of, and requirements for, competency management and evaluate the relationship between competency, training and resourcing
2. Critically review the importance of culture and behaviour in the workplace
3. Demonstrate how culture, behaviour and competency can be successfully managed in the workplace

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<tr>
<th>Delivery Methods</th>
<th>Postgraduate</th>
<th>Risktec CPD</th>
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<tr>
<td>Face-to-face</td>
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<tr>
<td>Distance learning</td>
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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec modules: Principles of Risk Management; HSE management Systems.
UK DfT-Accredited Port Facility Security Officer

What’s the purpose?
To equip personnel who are appointed as Port Facility Security Officers to undertake their role in accordance with the ISPS code and to achieve qualification for Maritime and Transport Security (MTS) Division compliance.

Who is this for?
Those appointed as PFSOs, those who may be required to deputise as a PFSO and managers who have responsibility for Port Facility Security Officers (desirable).

What does it cover?
- Threats to the Maritime Industry
- The Impact of Terrorism on Legislation
- ISPS Code & Amendments to SOLAS
- National and EU Legislation
- Principles of Security, Port Security Organisation
- Responsibilities of the PFSO, CSO, SSO
- Port Facility Security Assessment and process
- Port Facility Security Plan including security levels
- The Declaration of Security
- Terrorist weapons & characteristics
- Access, Screening & Search Procedure
- Port Facility IED Search Procedure
- Security & Surveillance Equipment
- Security Records & Documentation
- Training Requirements
- Port-Ship Interface (Documentation)
- Circumventing Security Measures.

After completing the module you should be able to:
1. Explain the roles and responsibilities of a Port Facility Security Officer
2. Apply the principles of undertaking a security risk assessment
3. Identify the security threats to the industry
4. Outline the relevant national and international legislation and regulations
5. Produce a port facility security plan and undertake port facility security assessments
6. Explain ship security measures.

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<th>Attendance only</th>
<th>Hours</th>
<th>Delivery Method: Face-to-face</th>
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What prior study is recommended?
Knowledge of the ISPS code.

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Emergency Response and Crisis Management

What’s the purpose?
The purpose of this module is to enable students to understand and apply the principles of emergency response planning and crisis management. It considers the need for emergency and crisis response planning and an integrated approach to emergency management. Emergency organisation and procedures are also studied.

Who is this for?
Managers, supervisors and HSE professionals who may be required to develop emergency or crisis response plans or exercises.

What does it cover?
- Emergency management basics
- Emergency anticipation and assessment
- Emergency prevention and mitigation
- Emergency preparations - planning, organisation, training, documentation, mutual aid, drills & exercises, etc.
- Emergency response and recovery
- Crisis management overview

After completing the module you should be able to:
1. Define the requirements and importance of Emergency and Crisis Response Management
2. Discuss aspects of integrated emergency management
3. Generate appropriate emergency and crisis response documentation

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management.
What’s the purpose?
This module provides an understanding of engineered risk control systems and the need for performance standards and technical integrity verification schemes. This involves exploring the concept of engineered risk control systems and the need for identifying Safety and Environmentally Critical Elements (SECEs) and performance standards. Assuring and verifying performance against the performance standards will be discussed as an integral part of technical integrity assurance throughout an asset’s lifecycle.

Who is this for?
Managers, discipline engineers, operators and HSE professionals required to identify SECEs, develop performance standards and verification schemes and implement performance assurance tasks.

What does it cover?
- Introduction to ERCSs
- Identification of ERCSs
- Criticality ranking
- Performance standards
- Performance assurance & verification
- Performance monitoring
- Integrity throughout facility lifetime

After completing the module you should be able to:
1. Analyse process plant to logically deduce relevant Engineered Risk Control Systems (ERCSs/SECEs)
2. Devise performance requirements/standards of ERCSs/SECEs
3. Illustrate how ERCSs/SECEs contribute to sustaining technical integrity over the lifetime of an asset

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management.
What’s the purpose?
The aim of this module is to provide an understanding of engineered safeguard systems and the need for performance requirements and standards, performance assurance and technical integrity verification schemes with a particular emphasis on the nuclear industry.

Who is this for?
Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?
- Engineered safeguard systems – definition, examples
- Defining performance standards
- Functional requirements
- Availability & reliability
- Survivability
- Interdependencies
- Performance assurance
- Verification of performance
- Technical integrity assurance
- Material selection
- Design reviews
- Fabrication tests, certification, etc.
- Construction reviews and inspections
- Commissioning tests
- Preventative maintenance systems

After completing the module you should be able to:
1. Analyse a nuclear plant to logically deduce the relevant engineered safeguard systems
2. Devise performance standards for nuclear safeguards
3. Illustrate how engineered control systems contribute to technical integrity over the lifetime of the nuclear plant.

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Education, skills or experience equivalent to undergraduate level.

risktec.tuv.com
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+44 (0)1925 611200
What’s the purpose?

The purpose of this module is to provide an overview of the Enterprise Risk Management (ERM) framework and process and the approaches for embedding ERM in your organisation and developing a strong risk culture.

Who is this for?

Managers, engineers, operators, HSE advisors and risk management practitioners.

<table>
<thead>
<tr>
<th>What does it cover?</th>
<th>After completing the module you should be able to:</th>
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<tbody>
<tr>
<td>Business drivers for ERM</td>
<td>1. Understand what ERM means in the context of a business</td>
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<tr>
<td>ERM principles, framework, process and limitations</td>
<td>2. Apply the steps of the ERM process</td>
</tr>
<tr>
<td>Risk identification and analysis</td>
<td>3. Assess the framework requirements for implementing ERM in the organisation</td>
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<tr>
<td>Risk evaluation and treatment</td>
<td>4. Define the risk culture and decision-making attributes required to manage risk within your business.</td>
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<td>Risk monitoring and review</td>
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<td>Risk communication and consultation</td>
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<td>Risk culture</td>
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<tr>
<td>Implementing the ERM framework</td>
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risktec.tuv.com
training@risktec.tuv.com
+44 (0)1925 611200
Environmental Risk Assessment

What’s the purpose?
This course aims to give students an awareness and understanding of environmental risk assessment. It covers some of the main areas where students might encounter the need to undertake an environmental risk assessment and how approaches to undertaking such an assessment compare with safety risk assessments. Some of the ways in which environmental consequences are assessed are considered, allowing students to judge the appropriateness or otherwise of some commonly encountered models.

Who is this for?
Managers, engineers, operators, designers and HSE professionals who need to lead or undertake risk management processes for their organisation and facilities.

What does it cover?
- Environmental risk assessment – key players, milestones and legislative drivers
- Risk assessment process
- Environmental hazard identification
- Environmental data, targets and criteria
- Environmental consequence models (air, water, ground)
- Environmental risk assessment in action
- BATNEEC and BPEO

After completing the module you should be able to:
1. Critique environmental regulatory styles
2. Evaluate environmental risk assessments, approaches and techniques
3. Evaluate methods and models available for environmental consequence modelling

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Fault Tree and Event Tree Analysis

What’s the purpose?
To enable participants to understand the principles of fault and event tree analysis and to perform their own assessments. The module looks at the development of fault tree and event tree models and populating them with suitable reliability data, human errors and dependent failures. It then considers quantification of the models and how they can be used to evaluate potential improvements.

Who is this for?
Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?
- Introduction to Fault Tree Analysis
- Fault Tree construction
- Minimal cut sets
- Basic event reliability data
- Dependent failures and human errors
- Fault Tree quantification
- Fault Tree analysis advantages & disadvantages
- Introduction to event tree analysis
- Event Tree construction and quantification
- Fault and Event Tree software

After completing the module you should be able to:
1. Consider when it is appropriate to apply fault tree analysis and event tree analysis
2. Design and analyse fault tree models incorporating appropriate reliability data for components, human error and dependent failures
3. Generate and analyse event tree models.

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management
What’s the purpose?
This course enables students to understand and apply the principles of functional safety to the development and assessment of safety systems, based on the IEC 61508 standard. The module illustrates the primary elements of the Safety Lifecycle and how these are applied to the development of safety systems. It also covers the assessment of safety systems to confirm that functional requirements and risk reduction targets have been achieved. Students will develop expertise in the application of the techniques necessary to specify, implement and assess safety systems to meet the requirements of IEC 61508.

Who is this for?
Electrical and mechanical engineers, operators, HSE advisors and risk management practitioners.

What does it cover?
- Introduction to functional safety – background, terminology and aims
- The Safety Lifecycle (IEC 61508 view)
- Hazard & risk analysis techniques
- SIL selection (setting targets and requirements)
- Safety requirements specification development
- SIL and the design process
- Beyond design lifecycle phases
- Compliance demonstration
- Safety/project lifecycle management

After completing the module you should be able to:
1. Define safety functions and target Safety Integrity Level (SIL) requirements which will reduce the associated risks to a tolerable level.
2. Apply the analysis methodologies to ensure that, when implemented, the safety systems achieve specified risk reduction targets.
3. Logically deduce how the level of risk reduction achieved by a safety system could be improved and when risk has been reduced to As Low As Reasonably Practicable (ALARP).

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.
What’s the purpose?
This course provides an understanding and awareness of the tools and techniques available for hazard identification, where they can be applied and what limitations may exist. Students will be introduced to the concept of HAZID, including the HAZID team and process. A range of other hazard identification techniques will also be introduced.

Who is this for?
Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?
- Basic concepts
- Overview of hazard identification techniques:
- Hazard identification through the project lifecycle
- Failure Modes and Effects Analysis (FMEA)
- Hazard and Operability (HAZOP) studies
- HAZID/checklist approach
- HAZID versus HAZOP
- Making recommendations

After completing the module you should be able to:
1. Assess the role of hazard identification in the risk management process
2. Critically review the tools and techniques available to carry out effective hazard identification at each lifecycle stage
3. Design a fit-for-purpose hazard identification study

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management.
What’s the purpose?
To gain an understanding of the technique, application and limitations of the HAZOP study methodology, one of the most commonly used hazard identification methods. This module does not provide detailed HAZOP facilitator training but does cover the skills needed and the work that the facilitator must do as part of the HAZOP Study. Students will have the opportunity to practise the technique.

Who is this for?

What does it cover?
- Introduction to risk assessment
- Basic engineering terminology
- Process safety incidents – lessons learned
- HAZOP - what, when, how, guidewords and parameters, nodding, teams, roles and responsibilities
- Recording methods, software, reporting and close-out
- Overview of the LOPA technique
- Major HAZOP studies, minor modification studies
- Common failings in HAZOPs, Limitations of HAZOPs
- Leading HAZOP teams
- Other forms of HAZOP – procedures, batch operations

After completing the module you should be able to:
1. Critically review the HAZOP technique and examples of output
2. Analyse how the HAZOP technique can be applied at the different stages of a project’s lifecycle such as FEED, detailed design, revalidation and decommissioning
3. Prepare for a HAZOP workshop, determine the skills and actions necessary to lead a HAZOP and how to generate a HAZOP report

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Cross-sector
What’s the purpose?
A formal management system or framework can help an organisation manage Health, Safety and the Environment (HSE). The aim of this module is to deliver an understanding of what constitutes an HSE Management System (HSE MS), and how these systems are applied in different hazardous industries. Legislative requirements and international standards for an HSE MS are also discussed. The module examines issues associated with the documentation and the human elements for the successful implementation of an HSE MS.

Who is this for?
Managers, HSE advisors and risk management practitioners.

What does it cover?
- Definition of an HSE MS
- Elements of an HSE MS
- Guidance and legislation
- Implementation aspects
- Documenting and implementing the HSE MS

After completing the module you should be able to:
1. Discuss the key factors to be considered when developing an HSE MS.
2. Assess the role of HSE MSs in reducing the probability and consequences of major accidents.
3. Examine issues associated with the implementation of HSE MSs.

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management.
HSSE Leadership for Managers

What’s the purpose?
This course aims to build an emotional commitment for HSSE and enables managers to effectively lead HSSE as an integral part of the business. The course considers the interactions between the group, the individual, business systems and values. It illustrates how bringing these elements together enables insights for the effective leadership of a proactive and ‘Just’ HSSE culture and improved organisational risk management.

Who is this for?
Line and functional senior and middle managers working in high-hazard industries. Worksite supervisors should attend the HSSE Leadership for Supervisors course.

What does it cover?
- Courage for HSSE leadership
- The leader’s role in preventing major accidents
- An organisation’s HSSE cultural journey
- Understanding motivation and behaviour
- A just HSSE culture and managing culpability
- HSSE as a value
- Leadership in reducing HSSE risk and incidents
- Qualities and skills of leaders
- Personal commitment and leading change

After completing the module you should be able to:
1. Lead positive HSSE cultural change within your team
2. Become a champion for a proactive and just HSSE culture
3. Commit to implementing your own personal HSSE leadership approach

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What prior study is recommended?
Managerial experience.

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HSSE Leadership for Supervisors

What’s the purpose?
This course aims to build an emotional commitment for HSSE and enables supervisors to effectively lead HSSE as an integral part of their day to day activities. The course considers the interactions between the group, the individual, business systems and values. It illustrates how bringing these elements together enables insights for the effective supervisory leadership of a proactive and ‘Just’ HSSE culture and improved organisational risk management.

Who is this for?
Front-line worksite supervisors, especially those working in high-hazard industries. Managers should attend the HSSE Leadership for Managers course.

What does it cover?
- Courage for HSSE leadership
- The supervisor’s role in preventing incidents
- An organisation’s HSSE cultural journey
- Understanding motivation and behaviour
- HSSE as a value
- Leadership in reducing HSSE risk and incidents
- Qualities and skills of leaders
- Important aspects of supervision
- Personal commitment and leading change

After completing the module you should be able to:
1. Lead positive HSSE cultural change within your team
2. Become a champion for a proactive and just HSSE culture
3. Commit to implementing your own personal HSSE leadership approach

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What’s the purpose?
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Line and functional senior and middle managers working in high-hazard industries. Worksite supervisors should attend the HSSE Leadership for Supervisors course.

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What prior study is recommended?
Managerial experience.
Human Factors in Design and Operations

What’s the purpose?
The purpose of this module is to explain how an understanding of human abilities, limitations and needs can be applied to the design and assessment of tasks, equipment, systems and processes, in order to reduce human error, improve safety and increase efficiency. It also highlights how and why human errors occur, and describes the methods, tools and techniques that can be used to identify, analyse and reduce them. Key Human Factors tools and methodologies will be demonstrated through the use of “real world” practical examples from high hazard industries.

Who is this for?
Managers, supervisors and HSE professionals.

What does it cover?
- Introduction to Human Factors
- Human Factors integration (HFI)
- Human Factors support to the design lifecycle for high hazard industries
- Defining human error
- Human error and violations
- Human Reliability Analysis (HRA)

After completing the module you should be able to:
1. Analyse the part played by individual, task and organisational factors in achieving safe and effective designs, systems and processes
2. Demonstrate how Human Factors should be integrated within a project/design lifecycle process for high hazard industries and discuss the key Human Factors inputs and activities that are typically required.
3. Analyse the potential causes of human errors and violations and discuss the measures that can be taken to reduce them.
4. Evaluate the different techniques and approaches available for qualitative and quantitative human error identification, assessment and error reduction.

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What’s the purpose?
To provide learners with a high level appraisal of how regulatory assessment and scrutiny is implemented, promoting effective safety assurance.

Who is this for?
Managers, engineers, operators, safety advisors and risk management practitioners.

What does it cover?
- Implementation of legal and regulatory frameworks
- Regulatory performance
- Safety assessment
- Key nuclear regulation areas
- Inspection and enforcement
- Developing safety

After completing the module you should be able to:
1. Analyse the development of, and compliance with, legislation and standards
2. Critically review how regulators’ performance and effectiveness is reviewed (how to regulate the regulator)
3. Explain the management of regulatory safety assessments - when, where, how
4. Assess implementation issues in regulatory inspection, auditing, investigation and enforcement
5. Examine the regulator’s role in promoting safety.

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
What’s the purpose?
This course provides an awareness and understanding of incident investigation and analysis, including why we need to investigate incidents. The stages of incident investigation are discussed: immediate actions in the event of an incident; initiating the investigation; collecting, organising and analysing data; identifying corrective and preventive actions; reporting the incident and learning from it. The module involves a significant amount of practical exercises.

Who is this for?
Managers, supervisors and HSE professionals who may be called on to participate in incident investigations.

What does it cover?
- Introduction
- Immediate actions in the event of an accident
- Planning the investigation
- Collecting data
- Data organisation/analysis
- Corrective actions
- Concluding the analysis

After completing the module you should be able to:
1. Demonstrate a thorough grounding in the underlying theories behind accident cause analysis
2. Apply the investigation and analysis process to determine the sequence of events and the causes of an incident
3. Critically analyse published incident and accident reports including the recommendations.

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.
What's the purpose?
The purpose of this module is to enable students to effectively use Investigator 3 software in support of an incident investigation. It is expected that students will have prior knowledge of appropriate investigation methods either from industry experience or from attendance on the recommended prior study.

Who is this for?
Managers, engineers, operators, safety advisors and risk management practitioners.

What does it cover?
- Summary of incident investigation approaches
- ERM principles, framework, process and limitations
- Using software in support of an investigation
- Introduction to Investigator 3 and getting started
- Creating a new investigation
- Planning the investigation
- Use of the Analysis Diagram: Root Cause, Tripod
- Recommendations
- Reporting

After completing the module you should be able to:
1. Understand the quality of data to be input into a completed fit-for-purpose incident investigation
2. Effectively use the Investigator 3 software in support of an incident analysis including identification of investigation paths and corrective actions
3. Use the software to produce reports and other forms of output.

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.

What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
Layers of Protection Analysis (LOPA)

What’s the purpose?
To gain an understanding of the technique, application and limitations of LOPA. This course covers the different variations of the LOPA methodology: single cause, multiple cause, simple and complex. It does not provide detailed LOPA facilitator training but does cover the skills needed and the work that the facilitator must do as part of the LOPA.

Who is this for?
Project Managers, Operation Managers, Process Engineers, Operators, HSE advisors and risk management practitioners.

What does it cover?
- LOPA terminology
- Information required for LOPA and review of HAZOP worksheets
- LOPA – hazard consequences and target mitigated event likelihood
- LOPA – hazard causes and frequencies
- LOPA – independent protection layers and probability of failure on demand
- LOPA – conditional/event modifiers
- Application of the LOPA variations: (i) single cause, (ii) multiple cause, (iii) simple and (iv) complex
- Carrying out SIL Classification using LOPA
- Recording methods, software and reporting
- Common failings and limitations of LOPA
- Leading LOPA teams

After completing the module you should be able to:
1. Apply the different variations of the LOPA technique
2. Critically review the LOPA technique and examples of output
3. Analyse how the LOPA technique can be applied at the different stages of a project’s lifecycle such as FEED, detailed design, revalidation and decommissioning
4. Prepare for a LOPA workshop, determine the skills and actions necessary to lead a LOPA and how to generate a LOPA report

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec modules: Principles of Risk Management, Hazard Identification, HAZOP Study
What’s the purpose?
The purpose of the course is to equip personnel, both male and female, who may be required to deal with disruptive passengers to manage any such incident safely, with due regard to customer care and the relevant law and with the minimum of disturbance to other passengers.

The training is delivered at two interdependent levels:

- A four-day course for ships’ officers as primary responders or security team leaders, usually delivered ashore.
- A series of four-hour seminars delivered on board to provide crew members with an overview of the knowledge and techniques required to support the primary responders.

Who is this for?
Those personnel with dedicated security duties on board ship; deck officers, pursers, masters at arms.

What does it cover?
- The operational framework: legal aspects, both maritime and land instruments, including human rights, equality and data protection legislation, as well as relevant civil law instruments
- Communication and conflict management (developed under UK security industry authority guidance)
- Unarmed defensive techniques and physical intervention, including physical intervention, restraints, handcuffing (rigid handcuffs), safe movement skills and custody procedures
- The physical skills trainers are all accredited UK Home Office instructors with police and prison service backgrounds.

After completing the module you should be able to:
1. Apply essential conflict resolution skills to de-escalate a potential confrontational situation
2. Utilise psychological techniques to intervene in a conflict in a measured and practical way
3. Explain the conflict resolution model
4. Identify when communication skills are no longer working and adopt a tactical and strategic approach
5. Understand the importance of the ethical appeal
6. Conduct a physical intervention (as a last resort)
7. Explain the custody, care and control process of an individual, with human rights at the forefront of the process
8. Explain the documentation processes
9. Conduct debriefs of staff members involved in an incident.

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<td>4 (each seminar)</td>
<td>4 hours (each seminar) for crew members on board</td>
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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.

No prior study is required.
What’s the purpose?
The aim of the course is to introduce the concept of risk management and its application to maritime operations. The requirements of maritime laws, regulations and guidelines are covered, as well as approaches to identifying, assessing and managing the specific risks associated with maritime operations.

Who is this for?
Marine operations managers, marine engineers, project advisors and risk management practitioners.

What does it cover?
- Aims and introductions
- Overview of maritime operations
- Overview of risk, hazards and consequences in maritime operations
- The risk management process
- Overview of maritime laws, regulations and codes
- Maritime accidents and their causes
- Example approaches to maritime risk management - using the bowtie diagram
- Summary

After completing the module you should be able to:
1. Critically review, from an HSE perspective, the principal types of operations and activities which exist within the maritime industry
2. Apply the principles of risk management to maritime operations to identify typical hazards and evaluate risks
3. Consider maritime legislation and its impact upon operations

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
What's the purpose?
The course provides students with an overview of the lifecycle of a nuclear power facility, its risks and hazards, risk-related regulations and the standard risk mitigation techniques.

Who is this for?
Managers, engineers and HSE professionals who need to lead or undertake risk management processes for their organisation and facilities. Individuals new to the nuclear industry who require an overview of the industry’s risks.

What does it cover?
- Introduction to the nuclear lifecycle
- Risk and safety regulations in the nuclear industry
- Hazards and controls in fuel manufacture and transport
- Hazards and controls in reactor operation
- Hazards and controls in transport and storage of irradiated fuel
- Hazards and controls in reprocessing irradiated fuel
- Hazards and controls.

After completing the module you should be able to:
1. Critically review the legal and regulatory obligations placed on the owners of a nuclear plant to demonstrate that the risks posed to people and the environment by operation of their plant are both tolerable and “as low as reasonably practicable”
2. Identify and assess the risks associated with nuclear hazards for a process or facility relevant at any stage of the nuclear cycle
3. Discuss effective means of avoiding each hazard or mitigating its consequences.

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.

What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management;
What’s the purpose?
This course enables students to understand and apply Probabilistic Safety Assessment (PSA) techniques with particular relevance to the nuclear industry. It provides an overview of nuclear industry safety assessment guidelines and principles. Reliability theory and system modelling are covered, including event tree and fault tree analysis. Consequence modelling in the nuclear industry and typical hazard scenarios such as fire, aircraft crash, natural hazards, etc. is also discussed. The module includes application of PSA results and demonstration of ALARP.

Who is this for?
Managers, engineers and HSE professionals who need to lead or undertake risk management processes for their organisation and facilities. Individuals new to the nuclear industry who require an overview of the industry’s risks.

What does it cover?
- Introduction to safety assessment in the nuclear industry
- Safety assessment, guidelines and principles
- Reliability theory and concepts
- System reliability and modelling
- Fault and hazard identification
- Frequency analysis
- Supporting data
- Consequence analysis in the nuclear industry
- Hazards PSA
- Application of results, including ALARP demonstration.

After completing the module you should be able to:
1. Deduce the PSA techniques appropriate to a real-life nuclear plant
2. Evaluate the risks associated with the operation and design of the
3. Identify and critically examine any additional measures that may be required to ensure that the risks are both tolerable and ALARP.

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Delivery Methods

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.
What’s the purpose?
To provide learners with a high level appraisal of the principles which underpin the design and safe operation of nuclear reactors, highlighting aspects which are relevant to regulatory assessment and scrutiny.

Who is this for?
Managers, engineers, operators, safety advisors and risk management practitioners.

What does it cover?
- Overview of nuclear and reactor physics
- Reactor design and operation
- Reactor safety
- Assurance
- Research and test reactors

After completing the module you should be able to:
1. Explain key elements of nuclear and reactor physics
2. Assess the design and operation of nuclear reactors from a regulatory perspective
3. Critically review the key engineering and technical issues which underpin nuclear reactor safety
4. Explain the key systems and processes for reactor safety assurance
5. Discuss the role and relevance of research reactors

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.
What's the purpose?
To provide learners with a high level appraisal of nuclear reactor safety principles and associated regulatory issues.

Who is this for?
Managers, engineers, operators, safety advisors and risk management practitioners.

What does it cover?
- National and international standards
- Legislative and regulatory framework
- Management of nuclear reactor risk
  - Risk categorisation
  - Defence in depth
- Reactor hazards and safety barriers
  - Core inventory
  - Barriers to release
- Nuclear reactor siting: safety considerations
  - Siting evaluation criteria
  - Evaluation of external hazards
  - Potential impact of reactor accident
- Principles of reactor accident management and emergency response.

After completing the module you should be able to:
1. Interpret nuclear reactor safety principles enshrined in standards and legislation
2. Consider management of risks from nuclear reactors
3. Assess the nature of reactor hazards and inherent safety
4. Critically review principles of nuclear reactor siting: criteria, hazards, impact and emergency control.

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
What’s the purpose?
The aim of this course is to introduce the concept of HSE risk management within the offshore wind industry, providing participants with a level of understanding of risk management principles commensurate with the magnitude of risks associated with this industry. It introduces practical tools and techniques to ensure offshore wind projects are conceived and executed safely and uses lessons learned from other more mature industries to establish an outline framework for a robust safety justification for an offshore wind farm.

Who is this for?
Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?
- Wind industry sources of risk
- Relevant regulations
- Risk Management through the project lifecycle
- Overview of risk assessment tools and techniques
  - Hazard Identification
  - Risk Assessment
  - QRA
  - Risk Reduction & ALARP
  - Asset Integrity Management
  - Safety Cases.

After completing the module you should be able to:
1. Apply appropriate risk assessment tools to situations relevant to the offshore wind industry
2. Apply the ALARP concept and conduct an ALARP assessment to an appropriate level of detail
3. Define the role and need for a “Safety Case” in the offshore wind industry.

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
What’s the purpose?
The purpose of this module is to enable students to understand and apply QRA techniques with particular relevance to the oil and gas and process industries. Students will be given an opportunity to conduct QRA for example oil and gas and process facilities. The module also covers risk criteria, application of the ALARP principle, sensitivity analysis and cost benefit analysis.

Who is this for?
Managers, engineers, HSE advisors and risk management practitioners.

What does it cover?
- Introduction to QRA
- Identify release scenarios
- Frequency assessment, event trees
- Consequence modelling (including immediate and time-dependent effects)
- Risk analysis
- Non-process hazards
- Risk criteria
- Sensitivity studies
- QRA software

After completing the module you should be able to:
1. Design QRA models incorporating appropriate input data and assumptions
2. Use QRA to analyse the risk to personnel
3. Compare QRA results with criteria and use to devise and evaluate potential risk reduction measures

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
**What’s the purpose?**
The course provides an introduction to and understanding of the various types of specialist risk study which may be carried out for an oil and gas or process industry facility or operation. It includes QRA (which is covered in more detail in a separate course), Escape, Evacuation and Rescue Analysis (EERA), TR Impairment Assessment (TRIA), Emergency Systems Survivability Analysis (ESSA), dropped object analysis, etc.

**Who is this for?**
Managers, discipline engineers and HSE and reliability professionals seeking to improve asset performance.

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<thead>
<tr>
<th>What does it cover?</th>
<th>After completing the module you should be able to:</th>
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<tbody>
<tr>
<td>- Introduction to risk studies</td>
<td>1. Critically review the use of specialist risk studies in the oil, gas and process industries</td>
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<tr>
<td>- Fire and Explosion Risk Assessment (FERA)</td>
<td>2. Apply specialist risk studies to simple oil, gas and process industry operations to analyse the risks to</td>
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<tr>
<td>- Smoke and gas dispersion</td>
<td>personnel</td>
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<tr>
<td>- Escape, Evacuation and Rescue Analysis (EERA)</td>
<td>3. Compare study results with criteria and use to devise and evaluate potential risk reduction measures</td>
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<tr>
<td>- TR Impairment Assessment (TRIA)</td>
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<td>- Occupied Building Risk Assessment (OBRA)</td>
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<td>- Dropped object analysis</td>
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<td>- Emergency Systems Survivability Analysis (ESSA)</td>
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<td>- Ship collision analysis</td>
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<td>- Transportation risk study</td>
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**What prior study is recommended?**
Education, skills or experience equivalent to undergraduate level. Risktec modules: Principles of Risk Management; Oil and Gas and Process Industry QRA.

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risktec.tuv.com
training@risktec.tuv.com
+44 (0)1925 611200
What's the purpose?
The course provides an overview of oil and gas industry facilities and activities and the typical hazards associated with this industry. It also provides an understanding of the role of risk management through the oil and gas project lifecycle. This includes evaluating regulatory regimes and the opportunities for risk reduction during the phases of a project.

Who is this for?
Managers, engineers and HSE professionals who need to lead or undertake risk management processes for their organisation and facilities. Individuals new to the oil and gas industry who require an overview of the industry’s risks.

What does it cover?
- Hydrocarbon industries sources of risk
- Regulatory regimes
- Value and risk management through the project lifecycle
- Overview of risk assessment tools and techniques

After completing the module you should be able to:
1. Critically review, from an HSE perspective, the engineering options for developing an oil and/or gas reservoir and delivering the products to market
2. Analyse the oil & gas industry project life cycle with regards to the change in the hazard and risk profile
3. Critically compare and contrast the different approaches to governance and regulation of the oil and gas industry around the world and analyse the influence of major incidents on regulatory regimes

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management
What’s the purpose?
The purpose of the course is to introduce and appraise the requirements for performance monitoring, auditing and management review, including relevant standards and guidance. It also considers the potential safety benefits and challenges in their use.

Who is this for?
Managers, HSE advisors and risk management practitioners.

What does it cover?
- Introduction to the requirements for performance monitoring, auditing & management review
- Relevant standards and guidance
- Establishing performance monitoring processes
- Objectives and Key Performance Indicators (KPIs) for the management system
- Management system auditing processes and techniques
- Establishing a management review process
- Implementation aspects and lessons learned.

After completing the module you should be able to:
1. Devise objectives and key performance indicators (KPIs) and a performance monitoring process
2. Generate an auditing process/audit plan and apply auditing techniques
3. Devise a management review process.

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: HSE Management Systems
What's the purpose?
To enable an understanding of the range of hazardous physical effects that can occur, an overview of human and equipment vulnerability to physical effects, and the uses and limitations of physical effects modelling. This includes an introduction to physical effects modelling and the opportunity for some hands-on practice of physical effects calculations.

Who is this for?
Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?
- What are physical effects and why model them?
- Source term release and discharge calculation
- Dispersion analysis
- Fire modelling
- Explosion modelling
- Subsea releases/dispersion
- Human and plant vulnerability to physical effects
- Commercial and public domain software tools

After completing the module you should be able to:
1. Analyse an industrial plant/installation to determine expected physical effects in the event of an incident
2. Evaluate, by applying physical effects modelling techniques, how these physical effects affect people and plant
3. Justify which of the available modelling techniques/software is appropriate to analyse physical effects in different circumstances, whilst understanding the limitations of these techniques

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management.
What's the purpose?
To provide learners with a high level appraisal of the underlying principles which determine the organisation, scope, objectives, reporting and communication of regulatory bodies.

Who is this for?
Managers, engineers, operators, safety advisors and risk management practitioners.

What does it cover?
- Legislative and regulatory requirements and standards
  - Principles of regulatory assessment
  - Responsibilities and objectives of assessment process
  - Scope of review and assessment
  - Review and assessment process
  - Documentation
  - Communication
  - Promotion of safety

- Principles of a regulatory body
  - Organisation and function
  - Independence
  - Authority
  - Professionalism

- Principles of inspection
  - Objectives and principles of inspection and enforcement
  - Key issues over nuclear lifecycle

After completing the module you should be able to:
1. Analyse regulatory requirements arising from legislation and standards
2. Critically review the key organisational factors, competency requirements and performance monitoring underpinning effective regulatory bodies
3. Apply the key principles of safety assessment and review over a nuclear facility lifecycle
4. Assess the requirements and scope of inspection and enforcement
5. Describe principles governing the role of the regulator in the establishment and development of effective safety processes and culture
6. Examine the importance of communication as part of an effective regulatory function.

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Delivery Methods

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
What’s the purpose?
The course provides an overview of risk management in the high hazard industries. It discusses the drivers for risk management, defines some of the fundamental terminology and introduces major risk management concepts, such as risk tolerability criteria and As Low As Reasonably Practicable (ALARP). The module briefly introduces some key risk assessment techniques and the situations in which they may be used. It considers the purpose and structure of an HSE/safety case and an HSE Management System (HSE MS). The module includes case studies of some significant historical accidents and their root causes, and evaluates the importance of safety leadership and organisational culture in preventing accidents.

Who is this for?
Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?
- Drivers for risk management
- Definitions and terminology
- Elements of the risk management process
- Demonstration of ALARP
- Example tools, techniques and studies
- The HSE case (or safety case) and HSE management system
- Leadership, culture and behaviours
- Causes of major accidents

After completing the module you should be able to:
1. Deconstruct the risk management process into its constituent components
2. Contrast key risk management terms such as “hazard”, “consequence” and “risk”
3. Evaluate the various drivers which cause organisations to manage risk
4. Demonstrate expertise in academic referencing

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
What's the purpose?
Controlling risks within high hazard industries 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. The course demonstrates how to apply theory in practice, using simple and more complex examples to illustrate key points. Participants who successfully pass the examination will be awarded a FS Engineer (TÜV Rheinland) Certificate.

Who is this for?
Process engineers, safety engineers and managers, instrument engineers and operations personnel, plant and operations managers. Persons with HAZOP study experience and a basic knowledge of loss prevention.

What does it cover?
- Process Safety Management, Risk identification
- What if?, HAZID, HAZOP, FMEA
- Risk analysis, Risk matrix, Bowtie analysis
- Fault Tree & Event Tree analysis
- Physical Effects Modelling (PEM)
- LOPA, SIL Assessment
- Risk evaluation, risk criteria, ALARP assessment
- Risk treatment
- Communication, consultation, monitoring & review
- Selecting the right technique
- Planning PH&RA studies
- Facilitating workshop-based studies
- Reporting PH&RA studies
- Examination.

After completing the module you should be able to:
1. Apply the most popular and internationally adopted methods and tools for identifying and managing the risks associated with process related hazards
2. Actively participate in and give effective support during the whole process hazard and risk analysis approach
3. Identify hazards and analyse risk, including applying the IEC 61882 HAZOP standard
4. Relate the requirements of Functional Safety according to IEC 61508 / IEC 61511 to process hazards and risk analysis.

Attendance (including 3.5 hour exam)  Hours  Delivery method: Face-to-face
30  4 days

If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.

What prior study is recommended?
PH&RA practitioner experience.

risktec.tuv.com
training@risktec.tuv.com
+44 (0)1925 611200
What’s the purpose?

Comprehensive hazard identification is the cornerstone of effective risk management. This course covers practical methods for performing process hazard analyses (PHAs) of systems and procedures, using the hazard and operability (HAZOP) and what-if/checklist techniques. It teaches participants the methods used to identify hazard potential and their consequences when plant/equipment operates outside its design intent.

Who is this for?

Project Managers, Operation Managers, Process Engineers, Operators, HSE advisors and risk management practitioners.

What does it cover?

- Process safety management & risk assessment
- Using the risk ranking matrix
- What-if/checklist technique, HAZOP technique
- Differences between HAZOP, what-if/checklist
- Analysis preparation, meetings, documentation & follow-up
- Understand how the LOPA technique can assist in the determination of the suitability of safeguards
- Common failings in PHAs, Human factors concepts
- PHA for analysing procedures and batch processes
- Roles & responsibilities of team and team members
- PHA revalidation.

After completing the module you should be able to:

1. Select the most appropriate technique for the PHA
2. Apply PHA techniques to identify hazards, clearly define the consequences and challenge the suitability of the safeguards
3. Report and document the findings from the PHA.

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.
What’s the purpose?
Controlling risks within major hazard enterprises requires a robust process safety management (PSM) system. This course introduces the essential elements of a PSM system and provides an overview of key focus areas including process safety leadership, process safety studies, strategies for reducing and managing risk, and monitoring and auditing performance.

Who is this for?
Project managers, project engineers, project advisors, operations and maintenance managers, and process safety practitioners, especially those working in large, complex, high-value project and operational environments.

What does it cover?
- Definition of Process Safety Management (PSM)
- Twenty elements of a PSM system
- Process safety standards and guidance
- Inherently safer design
- Process safety studies
- Process safety reviews
- Barrier diagrams (Bowtie analysis)
- Safety critical elements, performance standards, assurance and verification
- Process safety leading and lagging indicators
- Process safety audits
- Management of change
- Implementation aspects.

After completing the module you should be able to:
1. Analyse the process safety management system
2. Analyse the importance of assuring the integrity of engineered barriers (plant), competency of key personnel (people) and quality of procedures (processes)
3. Devise approaches for the successful implementation of the process safety management system.

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.
What’s the purpose?
The purpose of this module is to provide an overview of the project risk management process and the tools and techniques available for the systematic identification, assessment and mitigation of project risks.

Who is this for?
Project managers, project engineers, project advisors and risk management practitioners, especially those working in large, complex, high-value project environments.

What does it cover?
- What is a Project? Drivers of project risk management; time, cost, quality and safety
- Examples of major project failures and successes
- The project lifecycle
- The project risk management process
- The Project Risk Register
- The Project Business Case; relationship to Risk Register; lifecycle; reviews
- Project Organisational Structure
- The Project Plan; relationship to Risk Register
- Stakeholders and how they introduce risk (e.g. HSE risk); Project Communication Plan
- Project Controls: gate reviews, configuration control, change management, risk management tools (e.g. bowties).

After completing the module you should be able to:
1. Analyse the various drivers for managing project risks
2. Understand the components of the project risk management process
3. Compare and contrast the key tools and techniques available to identify and assess project risks
4. Understand how effective project risk management cost-effectively implements measures that reduces residual risk to an acceptable level.

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.

What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
Radioactive Waste Management and Decommissioning

What's the purpose?
To provide learners with a high level appraisal of the underlying principles of radioactive waste management and decommissioning.

Who is this for?
Managers, engineers, operators, safety advisors and risk management practitioners.

What does it cover?
- Nuclear waste management - System of Clearance, discharge, disposal, recycling and re-use, regulated management and disposal of radioactive waste
- Nuclear fuel disposal - Disposal options, design and operational safety of facilities, long-term safety assessment, regulatory involvement
- Reactor decommissioning - Reactor shutdown, closure of decommissioning project, reactor dismantling strategy and planning, safety and radiation protection standards and criteria, safety management strategy, key regulatory issues.

After completing the module you should be able to:
1. Critically review management of wastes from nuclear power plants
2. Consider disposal of spent nuclear fuel
3. Evaluate design considerations for reactor decommissioning.

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.

What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.

risktec.tuv.com
training@risktec.tuv.com
+44 (0)1925 611200
What's the purpose?
To provide learners with a high level appraisal of the underlying principles of radiation hazards, risks and control methods.

Who is this for?
Managers, engineers, operators, safety advisors and risk management practitioners.

What does it cover?
- Measures of radiation for personnel protection: biological radiation effects, short term/long term, deterministic/stochastic
- Standards of protection: Limitation, justification and optimisation, Internal/external exposure
- Means of protection: categorisation of workers and working areas, engineered and operational control, shielding, contamination control
- Issues on nuclear plant: sources of radiation in reactors, contamination monitoring and control, personnel monitoring and operational control.

After completing the module you should be able to:
1. Explain the principles of radiation protection
2. Apply exposure limits and means of protection
3. Critically review radiation protection in nuclear plants.

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.
What’s the purpose?
The course provides an overview of the typical hazards associated with railway infrastructure, rolling stock, operations and maintenance. It also provides an introduction to the concepts of risk management and an understanding of the role of risk management through the rail project lifecycle. This involves studying the different sources of risk in the rail industry, the regulatory regimes of the industry, the typical phases of a project and opportunities for risk reduction within each of the phases and the final acceptance into service.

Who is this for?
Managers, engineers and HSE professionals who need to lead or undertake risk management processes for their organisation and facilities, as well as individuals new to the rail industry who require an overview of the industry’s risks.

What does it cover?
- Risk Management introduction/refresher
- Rail industry sources of risk
- Collisions between trains
- Standard Mitigations
- Regulatory regimes/requirements
- Overview of Risk Assessment Tools and Techniques used in the industry

After completing the module you should be able to:
1. Deconstruct the risk management process into its constituent components and contrast key risk management terms such as “hazard”, “consequence” and “risk”.
2. Evaluate the various drivers which cause railway organisations to manage risk.
3. Understand the principle sources of hazards and evaluate the risks which typically arise during rail industry projects.
4. Apply knowledge of these hazards and the available mitigations to the management of risk within rail projects.

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.

What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management.
What’s the purpose?

The course enables students to understand and implement the requirements of formal safety assessment in the rail industry. This involves an introduction to safety and risk with an overview of safety regulations in rail engineering. Potential escalation events, human factors and safety management are discussed. Organisational responsibilities, risk criteria, risk modelling, risk reduction and decision making techniques also form part of the module.

Who is this for?

Managers, engineers, operators, HSE advisors and risk management practitioners.

What does it cover?

- Introduction to safety and risk in the rail industry
- Identifying and assessing railway hazards and risks
- Potential escalation events e.g. speed, derailment
- Human factors and safety management
- Organisational responsibilities
- Risk reduction and criteria
- Novel risk modelling and decision making techniques

After completing the module you should be able to:

1. Demonstrate knowledge of the principles of risk management and its relevance to the rail industry
2. Apply techniques to evaluate risk of the rail environment from both design and operation aspects
3. Generate a quantitative and/or qualitative rail formal safety assessment

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.
Reliability, Availability and Maintainability (RAM) Analysis

What’s the purpose?
To enable students to apply appropriate RAM methodologies to projects, ensuring that RAM is included within the design and that RAM targets are met. The module also discusses the concept of critical and life-limited items and the use of reliability centred maintenance strategies to reduce maintenance costs. Finally the module considers the trade-offs between RAM and safety requirements, as well as discussing how RAM shortfalls may be addressed.

Who is this for?
Managers, discipline engineers and HSE and reliability professionals seeking to improve asset performance.

What does it cover?
- Introduction to Reliability Availability and Maintainability (RAM)
- Availability and safety – potential conflicts
- RAM planning and choice of methodology
- RAM assessment methods – deterministic
- Numerical RAM assessment techniques
- Critical and life-limited items
- Maintainability and maintainability demonstrations
- Reliability Centred Maintenance (RCM)
- Methods of improving reliability

After completing the module you should be able to:
1. Identify and apply the analysis methodologies to systems and sub-systems, including both design and operation restrictions, to determine the Availability, Reliability and Maintainability of these Systems.
2. Critically review and balance the requirements of the design for RAM and safety.
3. Logically deduce how RAM results for a system may be improved.

| What prior study is recommended? | Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management |

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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.
What's the purpose?
To provide the theoretical background for conducting postgraduate project work. The module provides a valuable opportunity for graduates to acquire necessary skills and training to conduct research at postgraduate level. This includes giving the student an opportunity to develop ideas for a project/dissertation in risk and safety management and to engage with potential supervisors.

Who is this for?
All students progressing from PgDip to a Masters degree.

What does it cover?
- Study skills review
- Introduction – why do research?
- Defining the research problem
- Literature search and review techniques
- Research methodologies including statistical techniques, questionnaires and interviewing
- Project analysis and design
- Ethics in research
- Project planning
- Time management
- Gantt charts
- Presentation skills

After completing the module you should be able to:
1. Communicate findings in an accepted format
2. Assess previous research completed in a subject area
3. Critically appraise research data and assimilate, integrate and discuss in a logical way
4. Demonstrate compliance with appropriate ethical standards related to any research undertaken
5. Produce an appropriate project description and specification.

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management
**What’s the purpose?**
To provide a solid foundation of knowledge of risk assessment tools, with an emphasis on the concept of risk and qualitative risk assessment techniques.

**Who is this for?**
Managers, engineers, operators, HSE advisors and risk management practitioners.

### What does it cover?
- Identifying and recording hazards – registers, schedules, inventories
- The risk assessment matrix
- Risk analysis and risk reduction through project / facility lifecycle
- Significance of environmental aspects – environmental risk assessment
- Human factors in design
- Health risk assessment (HRA)
- Security risk assessment
- Business / commercial risk assessment
- Quantitative risk assessment (QRA) techniques
- Safety Integrity Level (SIL) assessment
- Layers of Protection Analysis (LOPA)
- External hazards, good practice in risk analysis

### After completing the module you should be able to:
1. Logically deduce the most appropriate risk assessment tool / technique to be used, depending on circumstances
2. Apply certain risk assessment techniques
3. Critically review example risk assessments and techniques

### Delivery Methods

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### What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec modules: Principles of Risk Management, Hazard Identification
What’s the purpose?
ALARP (As Low As Reasonably Practicable) is a commonly used but often misunderstood concept. The purpose of this module is to enable students to understand the hierarchy of risk reduction measures and the options for risk reduction in the project lifecycle. Students will be introduced to the concept of ALARP, practise applying it and learn how to demonstrate that risk has been reduced to ALARP levels.

Who is this for?
Project and operational managers, engineers and HSE professionals.

What does it cover?
- Risk management summary
- Hierarchy of risk reduction measures
- Risk reduction through the project lifecycle
- The ALARP concept
- Demonstrating ALARP
- Qualitative and semi-quantitative approaches
- Cost Benefit Analysis (CBA)
- Societal risk

After completing the module you should be able to:
1. Identify different options available for risk reduction
2. Decide when risk reduction measures can best be used
3. Describe the concepts of “tolerability of risk” and “As Low As Reasonably Practicable (ALARP)”
4. Apply the ALARP concept and conduct an ALARP assessment to an appropriate level of detail

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management
What’s the purpose?
The aim of the course is to introduce the investigation approach for safety, process or system based events, and provide details on various analysis techniques available to identify the root causes, whether equipment, human or organisational.

Who is this for?
Managers, supervisors and professionals who may be called upon to participate in the investigation and analysis of safety-, process- or system-based events.

What does it cover?
Six steps for a successful investigation:
- Step 1 – Immediate action
- Step 2 – Initiate the investigation
- Step 3 – Collect data
- Step 4 – Organise and analyse data
- Step 5 – Corrective and preventive actions
- Step 6 – Reporting and learning

Root cause analysis techniques:
- Cause and effect diagram & change analysis
- Event and casual factor chart
- Failure modes and effects analysis (FMEA)
- Fault tree analysis, Five why’s
- Hazard-barrier-target analysis (Tripod)
- Job task analysis
- Management oversight and risk tree analysis (MORT)
- Human errors, violations, safety culture & organisational effectiveness.

After completing the module you should be able to:
1. Plan an investigation and analysis
2. Choose and apply the most appropriate root cause analysis technique for the adverse event
3. Determine direct, contributing and root causes, and support conclusions logically with facts
4. Determine organisational effectiveness and safety culture weaknesses that promoted or created vulnerability to the adverse event
5. Explain key investigation results and support them in an oral briefing.

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.
**What’s the purpose?**

The aim of this module is to explain the purpose, content and uses of a Safety/HSE Case. Particular attention is focused on the best practical approaches to address legal, industry and company requirements. The differing types of Safety/HSE case during the project lifecycle are discussed, as well as differences in approaches between industries. Links between the case, supporting studies and the management system are studied. Best practices for implementing and maintaining the case are also reviewed.

**Who is this for?**

Managers, supervisors and HSE practitioners seeking to gain practical insights into how to structure a Safety/HSE case.

**What does it cover?**

- Historical drivers
- Legal Requirements - UK, Europe, worldwide
- Company and industry body requirements
- Differing types of case by project phase (e.g. PSR, PCSR, design, operational, decommissioning)
- Safety/HSE Case structure and approach by industry
- Bridging documents
- Links between the case and supporting studies and the case and the management system
- Documentation, management and maintenance of the Safety/HSE Case
- Roll-out and implementation
- Features of a fit-for-purpose safety case

**After completing the module you should be able to:**

1. Critically review the reasons for having Safety/ HSE Cases and the role of the safety/HSE Case
2. Justify the contents of a safety case
3. Discuss the key factors to be considered when planning a safety case.

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**What prior study is recommended?**

Education, skills or experience equivalent to undergraduate level.
What’s the purpose?
The purpose of the course is to equip personnel who may be required to respond to a ‘reportable’ crime aboard ship, to do so in accordance with the CVSSA 2010. Personnel who receive accredited training through this course will ensure a vessel’s compliance with USCG directive, under the Act.

Who is this for?
Those personnel on board ship who may be required to manage the immediate response to a reportable crime.

What does it cover?
- The Cruise Vessel Security and Safety Act 2010
- Security threats to cruise ships
- Maritime security legislation
- Crime prevention, threats, risks and vulnerabilities
- The principles of security
- Security and surveillance equipment
- Circumventing security measures
- Mandatory reporting
- The recognition of crime
- Evidence: early evidence kits, crime scene photography, processing items and objects as evidence
- Witnesses
- Missing persons, sudden deaths and fatal accidents
- Rape, sexual and serious physical assaults
- Post incident review and the experiential learning cycle
- Confidentiality and data protection
- Legal aspects: common offences, use of force and custody.

After completing the module you should be able to:
1. Contribute to the enhancement of safety and security through heightened awareness
2. Recognise security and safety risks, threats and vulnerabilities in order to prevent crime
3. Identify and preserve evidence
4. Report and record criminal offences.

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What prior study is recommended?
Education, skills or experience equivalent to undergraduate level.

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+44 (0)1925 611200
What’s the purpose?
The aim of this module is to provide an appreciation of workplace hazards, the systems for controlling them and the drivers for the need for continuous improvement in workplace safety. Task risk assessment, Permit to Work, behavioural safety systems and hazardous area classification are studied, as are personal protective equipment and management of hazardous chemicals and goods.

Who is this for?
Managers, supervisors and HSE professionals who have a responsibility for workplace safety.

What does it cover?
- Drivers for continuous improvement in workplace safety
- Workplace hazards
- Task risk assessment / job safety analysis
- Permit to work systems
- Behavioural safety systems, e.g. STOP
- Hazardous chemicals/ goods
- Personal protective equipment
- Hazardous area classification

After completing the module you should be able to:
1. Apply appropriate techniques to develop a documented workplace safety assessment
2. Consider alternative approaches to workplace safety management
3. Apply the concept of tolerability of risk and As Low As Reasonably Practicable (ALARP) to workplace hazard management

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<thead>
<tr>
<th></th>
<th>Hours</th>
<th>Delivery Methods</th>
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<tbody>
<tr>
<td>Risktec CPD</td>
<td>15</td>
<td>2 days, followed by assessment</td>
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<tr>
<td>Attendance only</td>
<td>15</td>
<td>2 days</td>
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If you are a corporate client and would like a customised delivery, please contact the training team to discuss your requirements.

What prior study is recommended?
Education, skills or experience equivalent to undergraduate level. Risktec module: Principles of Risk Management.