Welcome

Welcome to our learning and development guide for 2014.

As the UK’s largest independent, multi-discipline firm of engineers with over 25 years of experience in delivering integrated subsea engineering and training services to the oil, gas and renewables industries, we are passionate about learning and development.

We have a high level of expertise on whole-life engineering solutions, and our courses are specially built and taught by engineers with a wealth of knowledge and proven success in their fields.

Our courses have an international reach, our delegates can choose from public and in-company programmes in key locations around the world, or choose an online course for ultimate flexibility.

We understand the importance of providing the most up-to-date information in the most digestible format, which is why we invest heavily in course development and improvements, ensuring professional, high-calibre and fun training on every course.

This brochure showcases the vast breadth of our training capabilities, including public and in-company classroom courses as well as tailored online programmes. With so much on offer, I hope you find a course or training programme to suit your needs.

Whatever your choice, I promise you will have an enjoyable experience and will be better equipped to tackle the oil, gas and renewables challenges of the future and further develop your career opportunities and your company’s capabilities.

Jenny Matthew
Head of Courses

Meet the team

Jamie Burrows
Business Development Manager
Customer account management and in-company course enquiries.

Isha Pilbeam
Courses Co-ordinator
Course logistics, public and online course bookings, planning and scheduling, and customer care.

Jonathan Franklin
Lead Trainer
Technical authority for tailored course programmes and course development.

The team at Jee have decades of combined industry experience and are more than happy to help our range of clients however possible. We work closely with our delegates to understand their individual needs, and take a hands-on approach, whether planning a large in-company course, or taking the time to mentor an online learner.

Our full team are always on call, and we provide unrivalled support to our clients, becoming an extension of your company. With a wealth of knowledge in subsea and engineering training, we are able to help plan everything from course content to venues, providing strategic advice for tailored programmes and courses to fit into any company culture.
At Jee we recognise the importance of finding the right course to expand your knowledge and fit your company’s requirements. Our courses are developed in response to industry needs and segmented into foundation and practitioner level, to facilitate easy selection and integration into personal development plans.

The matrix below has been devised to allow you to quickly identify the right course to fulfil all your training needs. If you are unsure which is the right course for you, or would like to discuss bespoke training packages, please contact our dedicated Course Co-ordinators for further advice.

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<th>Course title</th>
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<td>Flow assurance</td>
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<td>IO&amp;G</td>
<td>Introduction to the oil and gas industry</td>
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<td>IOW</td>
<td>Introduction to the offshore wind industry</td>
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<td>LMT</td>
<td>Landfalls and marine terminals</td>
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<td>OP</td>
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<td>P&amp;C</td>
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<td>P&amp;P</td>
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<td>SC</td>
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<td>SH</td>
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<td>SP</td>
<td>Subsea pipelines</td>
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<tr>
<td>SS</td>
<td>Subsea systems</td>
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<tr>
<td>ADP</td>
<td>Advanced design including HP/HT and deepwater pipelines</td>
<td>19</td>
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<td>CSP</td>
<td>Construction of subsea pipelines</td>
<td>21</td>
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<tr>
<td>DSP</td>
<td>Design of subsea pipelines</td>
<td>18</td>
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<td>FDP</td>
<td>Failure of deepwater pipelines and risers</td>
<td>25</td>
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<td>EF</td>
<td>Engineering of flexibles</td>
<td>20</td>
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<tr>
<td>FS&amp;S</td>
<td>Free spans and on-bottom stability</td>
<td>27</td>
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<tr>
<td>ICSP</td>
<td>Installation calculations for subsea pipelines</td>
<td>22</td>
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<td>IMSP</td>
<td>Integrity management of subsea pipelines</td>
<td>24</td>
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<td>RDC</td>
<td>Reeling design calculations</td>
<td>23</td>
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<td>RRD</td>
<td>Rigid riser design</td>
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<tr>
<td>SPCI</td>
<td>Subsea power cable installation</td>
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Our courses
Training with the experts

The Jee training side of the business was initiated in 1995 when we received a request to train our client’s engineers to Jee standards. In the last 18 years, we have developed a broad spectrum of courses and evolved to become the benchmark for excellence in training for the oil and gas industry.

As a multi-discipline firm of engineers, we understand that investing in training is not only an investment in an individual, but also in the company’s future. Expansion and diversification of knowledge and capabilities is essential to project success, which is why we integrate the following factors into all our training:

- Our courses are written by engineers, for engineers – we understand what you need to know to do your job
- Our tutors are practising, chartered engineers with decades of experience in the subsea industry - you really are learning from the subsea experts. See pages 32 and 33 to meet our tutors
- The courses are written, delivered and managed via our ISO 9001 quality assurance system, guaranteeing high-calibre courses every time
- All course notes are professionally produced in full colour with annotated tutor notes and are available to download via the Jeenius app, giving full access to course notes wherever you are in the world. See page 8 to find out more
- We take on board feedback and continually invest in our courses, ensuring up-to-date course content
- We maximise learning and retention through the use of case studies, exercises, samples and videos
- Our standard courses are developed around training paths to build on existing engineering competencies

Range of services

The first step in providing world-class training is utilising our talent to produce courses of the highest calibre. The second is making them accessible to all, which is why we offer three types of training that can be combined or used independently to meet all your needs. See pages 5, 6 and 7 for further details.

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<thead>
<tr>
<th>Public</th>
<th>Online</th>
<th>In-company</th>
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<tbody>
<tr>
<td>Our most popular type of course, with subject matter suitable for every stage of a personal development plan</td>
<td>The ultimate in convenience, these courses offer the solution to overcome logistical and timeframe obstacles</td>
<td>Our in-company courses offer many of the same benefits of public courses with the addition of the below</td>
</tr>
<tr>
<td>- Choose from an array of courses covering foundation and practitioner levels</td>
<td>- Ideal for offshore workers</td>
<td>- Bespoke training to meet the delegates specific training requirements</td>
</tr>
<tr>
<td>- Expert tutor on hand to answer all questions and queries</td>
<td>- Start and complete the course at anytime from anywhere in the world</td>
<td>- Select a location and time of your convenience</td>
</tr>
<tr>
<td>- Network with industry peers</td>
<td>- Delegates can work at their own pace</td>
<td>- Plan around specific projects and project schedules</td>
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<tr>
<td>- Ideal for out-of-office learning</td>
<td>- Online discussion forums to share experiences with worldwide fellow delegates</td>
<td>- Integrate with internal company training</td>
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<tr>
<td>- Available in Aberdeen and Houston</td>
<td>- Online tutorials for additional support</td>
<td>- Tailored to your companies engineering standards</td>
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<tr>
<td>- Visa application assistance</td>
<td>- Create your own programme from over 70 modules</td>
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Public and Online courses

Public courses

Regular classroom courses worldwide
Our classroom courses are held regularly around the globe, and are currently scheduled in Aberdeen and Houston.

Ideal for out-of-office learning and continuing development, these programmes allow delegates to expand their knowledge of a wide variety of subsea topics and network with industry peers.

Each course is run by a tutor who specialises in the field and every delegate receives a hard copy of our world-renowned course notes, access to download their notes via our Jeenius app and a certificate awarding their Continuous Professional Development (CPD) points.

We run our courses frequently throughout the year to accommodate training needs as they arise, such as new staff members joining or the beginning of a new project.

Our up-to-date course schedule is available online at www.jee.co.uk where you can also find out more about our early bird and multiple booking discounts.

Online courses

Perfect for busy schedules or offshore employees
Delegates can choose a specific start date designed to fit around their own commitments, or gain instant access to begin right away. With all of the qualifications and specialised teachings of our classroom courses, our online learning programmes allow for remote learning from anywhere in the world, with tailored guidance and technical input from our range of expert teaching staff just a click away.

Our online systems are accessible and interactive, and provide:

✦ Easy navigation to track progress
✦ A glossary of terms and diagrams to illustrate key points
✦ Online discussion forums to share experiences with worldwide fellow delegates
✦ An online tutorial forum to check on progress or ask questions
✦ Jee’s world-renowned detailed notes for on-going reference
✦ Access to download course notes via our Jeenius app

Create your own
Delegates and companies can create their own online training programmes by selecting specialised topics from more than 70 modules. Fully supported by our qualified tutorial staff, these courses allow delegates to build a course around their choice of subject matter.

Visit www.jee.co.uk for the latest list of courses available online.
In-company courses

Bespoke training packages

For larger groups or teams, we bring our trainers to your facilities. Our in-company courses are renowned for the flexibility they afford, with our Course Co-ordinators working closely with each company to guarantee a bespoke service.

Choose from our off-the-shelf courses or a bespoke course designed to focus on your organisation’s needs and tailored to existing policies, ensuring continuity in messaging to meet all company standards.

Our experienced tutors can customise courses to your team’s requirements, and are in constant contact with your organisation in the lead-up to delivering a course to ensure that all points covered are relevant to a company and the sector in which it operates. We partner with an organisation through all phases of the course to guarantee customer satisfaction in every aspect of the programme.

Our wide breadth of in-company courses can be planned around specific projects and project schedules, and are organised to complement internal company training and key messages. Our courses provide value-added information for all delegates, and are taught by qualified, practising engineers who know the challenges of the industry first-hand.

Please contact our courses Business Development Manager Jamie Burrows on +44 1732 371 369 or email jamie.burrows@jee.co.uk to discuss your training requirements.

01 Competency needs identified

Working in close partnership with clients and drawing on our industry expertise we help to establish competency needs

02 Tailored training solutions

Blended learning, online or traditional classroom courses are assembled to reflect specific needs, projects and vessels. Training structures are finalised through discussions with key client personnel

03 Learning assessed

Post-course assessments and follow-up engagements are used to reinforce learning and ensure that the required knowledge is delivered
Graduate and Conversion programmes

Graduate programmes

Fast-track knowledge and productivity

Whether a company is welcoming a large group of graduates, or initiating a small number into its fold, Jee can help bring newcomers up to speed with our graduate training programmes, designed to provide continual learning for new placements.

With the current skills shortage in the energy industry, our courses can help provide fundamental knowledge to recent graduates and increase their subsea and engineering capabilities, all while staying in-line with company practices and procedures.

Our courses are designed for broad awareness and to help graduates tackle challenges within the subsea industry no matter what they determine their specialisation to be.

We understand that each company operates differently and we work closely with organisations to build courses complying with their work ethic and processes. Our courses are customised based on company needs, and can range from a two-day overview of the industry to a two-year, hands-on training and mentoring programme.

Conversion programmes

Combating the industry’s skills shortage

Our conversion programmes are designed to quickly and effectively transition engineering talent into the oil and gas industry and to meet the resourcing needs of today’s energy and service companies.

Whether you are an individual joining the industry or a company with a new intake of conversion engineers, Jee will work with you to develop a bespoke training programme, tailored to your needs and designed to support continual learning and progression.

Initially developed to meet Jee’s own engineering resource needs, our programmes are designed by engineers for engineers and are built on a 25 year heritage of high-quality subsea engineering and training know-how.

From off-the-shelf classroom and online courses to coaching, mentoring, job assignments and on-going assessment and review, our programmes offer the flexibility to study whilst adapting to a new industry and working practices.

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Year 1 Jee courses for graduates
Our world-renowned course notes are an integral part of our courses, our delegates tell us that our notes have become essential reference material back in the office and throughout their engineering career. To make these notes even more accessible we have launched a new phase in the Jee learning experience, the Jeenius app. Jeenius allows delegates access to Jee course notes at the touch of the button, from anywhere in the world.

Delegates can download the course notes for any Jee course they attend whether it be online, public or in-company, and when a course is updated the new version of the course notes will be available for download.

Benefits of Jeenius

- Onshore and offshore access to course notes
- Refresh your iPad to receive the updated version of the course notes featuring any new information you may need
- Learn more about complementary Jee courses
- Download to your iPad or PC

Using Jeenius couldn’t be easier, simply follow these three steps

- Download the Jeenius app on your iPad
- Email Jeenius@jee.co.uk with your full name, company name and name of the course(s) you attended to request your URL and unique authorisation code
- Copy and paste your URL and input your authorisation code when prompted to access your notes!

Visit www.jee.co.uk/jeenius for further details.

“I do think the Jeenius app is a very useful tool as it is a quick and easy way to reference the course study notes, easy to take along with you on the iPad and I would definitely recommend it.”

Dotimi Egbuson, Principal Integrity Engineer
Introduction to the oil and gas industry

About the course
This course provides a complete overview of the oil and gas industry from its origin, exploration methods and production processes, to commercial trends and technical terms. If you’re new to the industry or ever wondered how it all works, this is the course for you!

Key learning areas
✦ Gain a non-technical overview of the oil and gas industry, the people that work in it and key events that have shaped its development
✦ Build a better understanding of how you and your company fit into the bigger picture
✦ Gain an understanding of industry terms and acronyms
✦ Build an awareness of market drivers and commercial trends

The course was extremely informative.
Fernando Mendez, Project Engineer, Chevron

Course content

Hydrocarbon formation
Origin of oil and gas, migration of petroleum, accumulation of petroleum, location of major offshore fields

Hydrocarbon production
Onshore production wells, offshore platforms, offshore production drilling, existing offshore infrastructure, subsea equipment

Exploration methods
Geological field mapping, geophysical prospecting, exploratory drilling

Transportation systems
Offshore transportation systems, onshore pipeline spreads, pipelines through difficult ground, offshore decommissioning

Gas treatment and uses
Gas processing, LNG, gas distribution, power generation

Refining process
Refining crude oil, petroleum products

Commercial trends
History, politics, consumption and production, reserves, prices, new production

Course information
Level: Foundation
Duration: 1 day
CPD points: 7
Subsea systems

About the course
This course delivers an understanding of subsea systems from design and installation through to operation.

Learn how the whole system works through various teaching techniques including an onsite visit to see the equipment first-hand, and gain an awareness of the equipment used. Delegates will also get to grips with industry terminology and learn about market drivers and issues affecting subsea production.

Key learning areas
- Learn about issues affecting subsea production
- Understand the different structures and equipment involved in a system
- Find out about the design and installation of subsea equipment
- Discuss decommissioning regulations
- Get to grips with industry terminology

"This is probably the best course I have attended in 7 years of training. Great instructor, great materials, perfect level of detail."
Bobby West, Drilling Engineer, Chevron

Course information
Level: Foundation
Duration: 4 days
CPD points: 28

Course content

**History of subsea production**
Onshore development, offshore development, subsea development, future development

**Drilling and completing a subsea well**
Drilling sequence and components, well logging and testing, completion sequence and components

**Subsea configurations**
Template configuration, cluster configuration, daisy chain configuration, hybrid configuration, satellite configuration

**Spoolpieces**
Design considerations, metrology and construction, connection methods

**Subsea production control equipment**
Subsea trees, subsea control systems, umbilicals, subsea manifolds, system vulnerabilities

**Subsea processing**
Subsea multi-phase flow meters, subsea pumps and compressors, subsea separation and water reinjection, subsea HIPPS/IOPPS

**Structural design**
Template design, seabed interface, fabrication and testing, case studies

**Installation and commissioning**
Installation issues, installation methods, at the seabed, installation videos, commissioning, new technology

**Intervention**
Diving, ROV types and tools, ROV operations, ROV deployment, ROV manufacture, AUVs

**Workover**
Workover equipment and vessels, minor workover operations, major workover operations

**Subsea abandonment**
Subsea abandonment regulations, history and future of subsea abandonment, abandonment of subsea wells
Subsea hardware

About the course
This course gives a comprehensive and complete understanding of the equipment used in subsea production systems. Each piece of equipment is covered in detail, explaining the evolution of design, current best practice and the differences between each proprietary design.

Key learning areas
- Receive an overview of subsea equipment
- Identify the different components of subsea equipment and how they interface with one another
- Identify the pros and cons of equipment from each original equipment manufacturer (OEM)

Course information
Level: Foundation
Duration: 3 days
CPD points: 21

Enhance your roots of knowledge with Jee!
Khushboo Soni, Project Engineer, Saipem UK

Course content
Overview of subsea equipment
Subsea components and subsea configurations
Subsea wellhead assemblies
Selection considerations, wellhead design, casing string design, proprietary wellhead designs, design considerations for intervention
Blow-out preventers
Overview, annular type blow-out preventer, ram type blow-out preventer, proprietary design

Completions
Overview, tubing hangers, tubing design, downhole safety valves, intelligent completions, gas lift valves, downhole chemical injection, fibre optic sensors

Subsea trees
Overview, vertical tree, horizontal tree, tree selection, valve functions, proprietary designs, injection of chemicals, flow meters, retrievable components

Controls
Overview, equipment, proprietary designs, fail-safe shutdown, regulations

Templates
Overview, drill centre layout and field architecture, template design, protection structure design

Manifolds
Overview, manifold types, manifold design, retrieval of components, proprietary designs

Subsea valves
Valve uses, valve selection, multi-port valve blocks, valve position indicators, choke valves, gate valves, ball valves, check valves

Connection systems
Overview, flanges, other mechanical connections, actuated connections, proprietary design, hydraulic and electrical connections
Subsea controls

About the course
This course takes an in-depth look at how control systems operate, the engineering principles involved and identifies the key areas that are easily overlooked.

Delegates will get to see what different parts of the system look like, get an independent comparison of the kit and equipment available, and gain a greater understanding of this specialist area.

Key learning areas
- Differentiate the types of subsea control systems and identify different subsea equipment and functionality
- Gain an in-depth understanding of how subsea control systems operate
- Benefit from an independent comparison of the equipment available
- Understand the issues when overseeing the design and manufacturing of subsea controls equipment
- Take a look at future technologies

I found the course very useful and I now have the confidence to ask the right questions when interfacing with controls engineers.

Gregory Ogbeifun, Subsea Engineer, BP Exploration

Course content

<table>
<thead>
<tr>
<th>Introduction</th>
<th>Types of control system</th>
<th>Typical equipment</th>
<th>MCS interfaces and mimics</th>
<th>Subsea control fluids</th>
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</thead>
<tbody>
<tr>
<td>Overview, what a production system does, understand the principles of operation of subsea control systems</td>
<td>Production and workover/intervention control systems, advantages and disadvantages of each system, understand the interconnection and operation of the major components of the subsea control system</td>
<td>Understand the operation of the major items of equipment, master control station, electrical power unit, hydraulic power unit, topside and subsea umbilical terminations, subsea control modules (Xtree, manifold etc.)</td>
<td>Typical MCS/DCS, security, logging on and off, navigation and mimic views, icons and buttons</td>
<td>Understand the importance of the hydraulic control fluid, the control fluid as a component of the system, control fluid types and uses, environmental impact, controls intervention, fault find to major unit level, isolation and removal of subsea components, well completion</td>
</tr>
<tr>
<td>Systems operations</td>
<td></td>
<td>Demonstrate practical familiarity with the Master Control Station Computer (MCS) and all relevant facilities, communications, electricals, hydraulics, umbilicals and sensors</td>
<td>Well production, valve and choke operation, alarms, ESD, trending, functionality, options</td>
<td>Future technologies</td>
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<tr>
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<td>Technology drivers, deepwater, distance separation and boosting</td>
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</table>
Risers, umbilicals and flexibles

About the course
As one of Jee’s most popular courses, this programme provides a complete understanding of risers, umbilicals and flexibles and how they operate within the subsea environment.

Learn about different types of risers, umbilicals and flexibles, their uses and design, installation and operational considerations. Delegates also find out about FPSOs and how they impact on the design and layout of risers and umbilicals.

Key learning areas
- Learn about the different types of risers, umbilicals and flexibles and their uses
- Identify design, installation and operational considerations
- Learn about the latest developments in riser systems
- Understand how FPSOs impact on the design and layout of risers and umbilicals
- Get to grips with key industry terms and confidently apply them to projects
- An introduction to riser integrity management

Best training course I have been on. Wow!
Ronald Brown, Lead Subsea Systems Engineer, BP Trinidad & Tobago

Course information
<table>
<thead>
<tr>
<th>Level</th>
<th>Foundation</th>
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<tbody>
<tr>
<td>Duration</td>
<td>4 day</td>
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<tr>
<td>CPD points</td>
<td>28</td>
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</table>

Course content

Riser types and uses
Production vessel selection, drilling risers, production risers, export risers, completion and workover risers

Rigid riser design
Design approaches, riser sizing design, design for fatigue

Steel catenary risers
Design, manufacture, installation

Fixed rigid risers
Types of rigid riser, design of rigid risers, installation for rigid risers

Hybrid risers
Types of hybrid risers, generic design, fabrication and installation

Flexibles
Riser configurations, design, components, manufacture

Umbilicals
Cross-section design, system design, fittings, manufacture

Flexible and umbilical installation
Storage and loadout, flexible and umbilical installation, riser installation, pre-commissioning

Introduction to FPSOs
Overview of FPSOs, mooring and turret arrangements

FPSO vessel motions
Components of motion, types of vessel motion, wave frequency motion, drift and higher order motions

FPSO interfaces
Overview of FPSO interfaces, risers and umbilicals, processing and storage, offloading and export

Bonded hoses
Types of bonded hoses, offloading hose configurations, manufacture, handling and storage, installation, operation and maintenance

Introduction to riser integrity management
Monitoring, inspection, damage assessment, repair
Subsea pipelines

About the course
This course provides a comprehensive and complete understanding of subsea pipelines from design and construction through to operation.

Gain an appreciation of pipeline design considerations, pipe manufacturing methods and materials selection, as well as a knowledge of flow assurance, installation methods and pipeline integrity management systems.

Key learning areas
- Gain an appreciation of important considerations for pipeline design
- Look at manufacturing methods and material selection
- Learn about installation methods and construction support
- Get an introduction to pipeline integrity, including flow assurance and inspection
- Discuss repairs and pipeline decommissioning
- An understanding of oil and gas industry terms and acronyms

Phil is hugely experienced. He successfully managed to communicate a load of information along with examples that helped me to grasp what was covered.

Amit Rajani, Senior Process Engineer, Genesis Oil and Gas

Course content

| Field layouts | Example layouts, pipeline and cable uses, subsea equipment, platforms and floating production systems, riser configurations |
| Route selection | Survey techniques, soil types, routing of pipeline |
| Pipe manufacture | Rigid steel pipe, flexible pipe |
| Pipeline design | Pressure, design approaches, diameter sizing, wall thickness for bursting, wall thickness for hydrostatic collapse, wall thickness for local buckling, global buckling |
| Materials | Selection for strength, selection for corrosion resistance, clad and lined pipelines, titanium and composites |
| External coatings | External corrosion protection, cathodic protection, on-bottom stability, thermal insulation, pipe-in-pipe systems, active heating of lines |
| Common work | Construction survey, route planning, welding, non-destructive testing (NDT) |
| Installation methods | S-lay, J-lay, reel-lay, bundles and towed installations, flexibles and umbilicals |

Materials
Selection for strength, selection for corrosion resistance, clad and lined pipelines, titanium and composites

External coatings
External corrosion protection, cathodic protection, on-bottom stability, thermal insulation, pipe-in-pipe systems, active heating of lines

Common work
Construction survey, route planning, welding, non-destructive testing (NDT)

Introduction to pipeline integrity
Failures: frequency and incidents, PIMS

Flow assurance
Operational controls, additives, pigging

Construction support
Landfalls, trenching and burial, pre-commissioning

Tie-ins, spools and risers
Tie-ins and spools, rigid steel riser installation, flexible riser installation

Pipeline inspection
Risk-based inspection plan, external survey, internal inspection, anomaly assessment

Repairs, tie-ins and decommissioning
Repairs, hot taps, tees and wyes, remedial works, decommissioning
Onshore pipelines

About the course
Providing a comprehensive understanding of onshore pipelines from design, planning and installation through to operation.

Gain an appreciation of pipe manufacturing methods and materials selection, plus an understanding of the challenges of installing pipelines in difficult terrains. Delegates will also expand their knowledge of corrosion, fitness for purpose, the importance of integrity management systems and defect assessment and repair methods.

Key learning areas
- Gain an appreciation of pipe manufacturing methods and materials selection
- Learn about the challenges of installing pipelines in difficult terrains
- Learn about corrosion, fitness for purpose, integrity management systems and defect assessment and repair methods

An excellent foundation course for those wishing to gain a broad knowledge of onshore pipelines.

Claudio De Natale, Mechanical and Piping Engineer, Amec UK

Course information
Level: 
Foundation 
Duration: 
3 days 
CPD points: 
21

Course content
- Pipeline routing and planning
  Route selection, environmental impact assessments, geological hazards, crossing design, planning, exercise
- Pipe manufacture and components
  Pipe manufacture, bends, trees and wyes, valves and actuators, instrumentation, pumps and compressors
- Pipeline hydraulic design
  Liquid pipelines, gas pipelines, multi-phase pipelines
- Pipeline wall thickness design
  Design methods, design for bursting, design for impact protection, risk management, exercise
- Pipeline corrosion design
  Corrosion mechanisms, external coatings, cathodic protection, internal coatings
- Pipeline construction
  Site preparation and stringing, welding and NDT, excavation, lowering and reinstatement, pre-commissioning, costs
- Pipeline crossings
  Crossing types, crossing construction methods
- Construction in difficult terrains
  Mountainous regions, swamps and marshes, arctic, deserts, forests
- PIMS and routine operations
  Principles of PIMS, code requirements, routine operations
- Inspection
  Leak detection, external inspection, internal inspection
- Defect assessment and repair
  Corrosion defect assessment, dent assessment, repair techniques, section replacement methods
Landfalls and marine terminals

About the course
This specialist area of pipeline engineering is not fully understood by many engineers, yet it is critical knowledge for anyone working on onshore and offshore pipeline projects.

This course gives a clear and comprehensive understanding of landfalls and marine terminals and how offshore pipeline systems are connected to shore.

Key learning areas
- Understand the process to select a site, design and operate a marine terminal
- Understand how landfalls and outfalls help get oil and gas to shore
- Find out about the different types of single point moorings (SPMs)
- Learn about the marine structures required at a marine terminal
- Look at incidents that have happened at terminals and how to avoid them

The course is delivered by an experienced expert and covers a niche area, which is difficult to access through other training providers.

Rabinder Manku, Civil Marine Engineer, BP Exploration

Course information
Level: Foundation
Duration: 3 days
CPD points: 21

Course content
Overview of marine terminals
Overview of items and interactions, different types of terminals
Site selection for marine terminals
Geographical considerations, site soil survey, environmental considerations, environmental and social impact studies (EIA and EIS), site civil works

Tanker operations
Berthing at a jetty, berthing at a buoyed mooring, transfer of hydrocarbons, transfer of other items, safety systems

Jetties, trestles and offloading systems
Environmental forces on tankers, types of quaysides, trestles and jetty berths, design of trestles and jetty structures, equipment requirements, product pipework, marine incidents safeguards and mitigation

Single point and multi-buoy moorings
Types of SPM and CBM, SPM design considerations, bonded hoses, anchor, chain and buoy design, construction

Landfalls, intakes and outfalls
Landfall design, pull from shore, directional drilling, pipeline pulls from laybarge, trenching, connections

Storage tanks
Types of hydrocarbon storage tanks, design considerations, loss of containment protection, fire protection, security

Marine terminal design and operation
Terminal equipment, incidents, ignition control, terminal layout, terminal operation
Rigid riser design

About the course

With the increase in deepwater developments, more and more deepwater rigid riser systems are required. This course teaches delegates about the design of various types of rigid risers, including steel catenary risers (SCRs), hybrid risers and more conventional shallow water risers.

Key learning areas

✦ Learn about the different riser types and uses, from drilling risers to hybrid risers
✦ Understand the engineering principles and approaches to riser design
✦ Learn how to recognise fatigue, assess it and improve fatigue life
✦ Gain an understanding of riser behaviour, failure theories and which sections are most at risk

A fantastic course, presented by [a] very experienced professional engineer. My knowledge of the subject has vastly improved.

Euan Elphinstone, Asset Integrity Engineer, EnQuest

Course content

Rigid riser types
Riser types and uses, drilling risers, completion/workover risers, production risers and export risers

Lifecycle
Drilling and developing wells, design, manufacture, installation methods, completion and workover operations, maintenance, abandonment and disposal

Components and fitments
Common components, vessel fitments, coatings, VIV suppression devices, connection methods

Riser design approaches
Safety risk and reliability, limit state approach, deriving safety factors

Size and strength
Drilling risers, analysis approach, sample analysis, production and export riser sizing

Wave and currents
Metocean reports, tides, wind, currents, waves, hydrodynamic loadings

Fatigue and fracture
Recognising fatigue, riser fatigue, assessment, fracture mechanics, improving fatigue life, corrosion

Vessel response
What are RAOs? OrcaFlex checks, exercise

Soil-riser interaction
Soils and soil types, pipeline survey methods, deriving soil properties, riser behaviour

Global bending
Catenary curves, catenary equations, pipe stresses, failure theories, worked example, exercise

Vortex-induced vibrations
Sections of risers at risk, modelling VIV, general design approach, OrcaFlex approach, tank trial comparisons

Design basis and riser analysis
Design considerations, typical development of design, input verification, modelling on nonlinearities, design connectors

Course information

Level: Practitioner
Duration: 3 days
CPD points: 21
Design of subsea pipelines

(Formerly Design of Subsea Pipelines - Part 1)

About the course
This course provides a technical introduction to subsea pipeline design, including the engineering principles and codes required.

Learn about subsea pipeline design and understand why subsea pipelines are made the way they are. Delegates will reinforce their learning by carrying out design calculations using codes and will discuss industry developments and new technologies.

This course will help engineers to understand contractors' output, design houses to apply calculations to projects, and regulation bodies to follow up-to-date industry codes.

Key learning areas
- Understand issues affecting design, to appreciate why pipelines are made the way they are
- Practice calculations based on industry codes
- Discuss industry developments and new technologies
- Gain know-how on which questions to ask

The course for all young pipeline engineers.
Tesfalem Weldemaniam Kelela, Master Thesis Writing at IKM, IKM Ocean Design AS

Course content

<table>
<thead>
<tr>
<th>Pipeline routing</th>
<th>Corrosion</th>
<th>Bottom roughness and intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rules for routing, exercise, route survey, alignment sheets</td>
<td>Types of corrosion, control measures</td>
<td>Bottom roughness analysis, spans, intervention</td>
</tr>
<tr>
<td><strong>Diameter sizing</strong></td>
<td><strong>Design for strength</strong></td>
<td><strong>Exercises and worked examples on:</strong></td>
</tr>
<tr>
<td>Sizing for flow, fluid properties, flow fundamentals, single phase flow</td>
<td>Design principles, bursting, collapse, buckling and combined stresses, strain-based design, exercise</td>
<td>Route planning, diameter sizing, insulation thickness, wall thickness, end expansion, stability prediction</td>
</tr>
<tr>
<td><strong>Thermal design and insulation</strong></td>
<td><strong>End expansion and spoolpieces</strong></td>
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</tr>
<tr>
<td>Need for thermal design, fundamentals of heat transfer, pipeline heat transfer, insulation design considerations, insulation systems, application of insulation, operational problems in deep water, exercise</td>
<td>End force and expansion factors, end expansion, temperature profile, exercise, spoolpieces</td>
<td></td>
</tr>
<tr>
<td><strong>Materials specification</strong></td>
<td><strong>On-bottom stability</strong></td>
<td></td>
</tr>
<tr>
<td>Material selection, review of material properties, specification of line pipe</td>
<td>Review of fundamentals, oceanography, hydrodynamics, resistance, stability analysis, computational fluid dynamics, exercise</td>
<td></td>
</tr>
</tbody>
</table>

DSP (formerly Design of subsea pipelines - Part 1)
Advanced design including HP/HT and deepwater pipelines
(formerly Design of subsea pipelines - Part 2)

About the course
This course imparts technical knowledge of the more complex design issues affecting pipelines, such as deepwater, high pressure, high temperature and highly corrosive fluids and gases.

Gain an understanding of how to apply the correct codes of practice, carrying out design calculations and worked examples for use in future projects, as well as learning about solutions to pipeline failures from real-life case studies.

Key learning areas
- Understand how to apply design codes correctly
- Discuss ways to protect subsea pipelines, such as rock dumping and trenching
- Learn about solutions to pipeline failures from real-life case studies
- Use worked examples to learn design calculations that can be applied to future projects

"This advanced training has deeply improved my knowledge on common and specific design issues of deepwater and HP/HT pipelines."

Hendri Sudjianto, Pipeline Engineer, Total E&P Indonesie,

Course information
Level: Practitioner
Duration: 4 days
CPD points: 28

Course content
<table>
<thead>
<tr>
<th>HIPPS</th>
<th>Configuration and components, design, applications</th>
</tr>
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<tbody>
<tr>
<td>Hydrostatic collapse</td>
<td>Need for buckle arrestors, buckle arrestors, worked example, exercise</td>
</tr>
<tr>
<td>Further corrosion</td>
<td>Advanced corrosion mechanisms, corrosion control, corrosion rates, case studies</td>
</tr>
<tr>
<td>Lateral buckling</td>
<td>Virtual anchor spacing, design process, out-of-straightness surveys, buckle mitigation</td>
</tr>
<tr>
<td>Upheaval buckling</td>
<td>Upheaval buckling mechanism, upheaval buckling analysis, worked example</td>
</tr>
<tr>
<td>Strain-based design</td>
<td>Overview of strain-based design example, loading, low strain requirements, moderate strain requirements, high strain requirements</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Principles of fatigue, fatigue loadings, design for fatigue, worked example, case studies</td>
</tr>
<tr>
<td>Expansion, walking and anchoring</td>
<td>End expansion, pipeline walking, walking modes, pressure effects, exercise, walking and lateral buckling, anchoring, other prevention and mitigating measures, case study</td>
</tr>
<tr>
<td>Pipeline protection</td>
<td>Hazards, pipeline loads, pipeline load capacity, risk and safety analysis, pipeline coatings, rock dump, trenching for impact protection, protection structures, 'soft' protection options</td>
</tr>
<tr>
<td>Exercises and worked examples on:</td>
<td>Hydrostatic collapse, lateral buckling, strain-based design (ECA), fatigue, corrosion control, pipeline walking</td>
</tr>
</tbody>
</table>

Book a course: www.jee.co.uk  e: training@jee.co.uk  t: +44 1732 371 391
Engineering of flexibles
(formerly Flexibles, risers and flowlines)

About the course
This course gives an expert level of understanding of flexible risers and flowlines. The course will teach you the skills required to write accurate specifications for flexibles, and enable you to develop an understanding of how the different wire profiles affect the performance of a flexible, as well as how flexibles are affected by installation and operational loads.

Key learning areas
- Gain a comprehensive understanding of flexible flowlines and risers, from their design and manufacture to installation and operation
- Build knowledge of the materials and equipment used
- Understand how FPSO and SPM design affects the choice of riser system
- Apply theories learnt to real-life projects through case studies and group discussions
- Gain an understanding of related industry terms and acronyms
- Understand the different types of software available and become familiar with OrcaFlex

Jee tutors are extremely knowledgeable and well-seasoned. They provide lots of extremely useful knowledge.

Jordan Sammons, Quality Engineer, BP America

Course information
Level: Practitioner
Duration: 4 days
CPD points: 28

Course content
Introduction to flexibles
Design of flexible flowlines and risers, riser configurations, flexible riser components, manufacture of flexibles, testing of flexibles by manufacturer

Structural design
Resistance to hoop loads, resistance to tensile loads, resistance to torsion, resistance to corrosion, resistance to temperature

Design of ancillary equipment
End fittings, bend stiffeners, bend restrictors, bell mouths, mid water arches, buoyancy modules

Installation of flexibles
Load out of flexibles, installing flexibles, J-tube installation, riser installation

FPSO interfaces
Introduction, choice of system, motion effects, riser interfaces

Flexible riser analysis
Wave theory and hydrodynamics, RAOs, static analysis, dynamic analysis

Flexible analysis software
Software available, OrcaFlex walkthrough, OrcaFlex dos and don’ts, OrcaFlex exercise

Post-lay trenching and burial
Trenching considerations and specifications, trench transitions, backfill options

Integrity of flexibles
Inspection techniques, monitoring methods, design and installation incidents, operational deterioration and damage

Case study: Chinquetti field
Design of flexible to prevent buckling, instability and spanning
Construction of subsea pipelines

About the course
This course delivers an understanding of the processes, equipment and vessels involved in offshore pipe-lay and different pipe-lay methods used.

Gain an appreciation of the size and nature of offshore pipe-lay vessels and equipment, and gain confidence in identifying the best choice for pipe-lay and be able to talk technically about pipeline construction. Areas covered include trenching, hydrotesting, surveys and tie-ins.

Key learning areas
✦ Understand how to identify the best pipe-lay option
✦ Discuss issues affecting pipeline installation
✦ Look at the different types of surveys that you need to know about
✦ Get an appreciation of the size and nature of offshore pipe-lay vessels and equipment
✦ Gain the confidence to talk technically about pipeline construction
✦ Acquire an understanding of trenching, hydrotesting, surveys and tie-ins

Very good coverage of the fundamental pipe-lay methods… unique course!
Jonathan Webster, Pipeline Engineer, BP

Course information
Level: Practitioner
Duration: 4 days
CPD points: 28

Course content
S-lay
S-lay vessel types, S-lay process, S-lay market and vessels, insulated lines, lay curve control

Pipe supply, welding and NDT
Line pipe supply and specifications, welding methods, welding procedure, NDT

J-lay
J-lay sequence, J-lay process, J-lay vessels, J-lay performance, rapid pipe welding, mechanical connectors, J-lay from drilling rig

Bundles and towed installation
Bundle design, bundle fabrication, towhead structures, towing methods, insulation and heating systems, deep-water bundles, advantages of bundles, surface tow

Installation of flexibles
Unbonded flexibles installation process, umbilical cables, bonded hoses

Reel-lay
Reel-lay process, reel-lay market and vessels, special considerations, technical analysis, exercise

Landfalls
Pull ashore into cofferdam, pull offshore from onshore construction site, directionally-drilled landfalls

Tie-ins
Flanged connection by diver, hyperbaric welding, diverless tie-ins

Pre-commissioning
Gauging and flooding, hydrotesting, de-watering, air and vacuum drying, testing of valves and controls

Management systems
Law, QA, commercial

Health, safety and environment
Health, safety, environment

Survey
Survey methods, survey operations

Seabed modification
Sweeping, rock removal, protection, rock dump, concrete mattresses, protection structure, crossings

Post-lay trenching and burial
Ploughing, jetting, cutting, cable trenching, trench transitions, backfilling

Diving and ROV operations
Diving and equipment, ROV operations

Decommissioning and abandonment
Legislation, decommissioning in-situ, recovery, re-use, costs
# Installation calculations for subsea pipelines

## About the course
This is a highly technical course providing detailed knowledge of the subsea pipeline installation calculations required for all stages of a pipeline’s lifecycle from pipe-lay to abandonment and recovery.

Practice installation calculations using worked examples to understand industry standards and codes and how they are applied. Gain the confidence to assess and verify calculations used in subsea projects.

## Key learning areas
- Understand industry standards and codes and how they are applied to pipeline installation
- Practice installation calculations using worked examples
- Assess and verify calculations used in subsea projects

## Very useful course for all areas of our industry to understand different aspects of installation calculations.

Sethu Miriyala, Project Engineer, Subsea 7

## Course content

### Catenaries
- Catenary curves, pipe-lay catenary equations, pipe stresses, worked example, exercise, control by tension

### Bending
- Bending during S-lay, worked example, exercise, break-over lengths, concrete-coated pipe, horizontal lay curve radii

### Reeling
- Strain concentration, material qualification, ovalisation, reeling forces, worked example exercise

### Sagbend buckling
- Local buckling criteria, prediction of buckling in catenary, worked example, exercise, buckle propagation

### Pipe pull forces
- Landfall setup, worked example, exercise, alternative pull setups

### Dynamics
- Vessel motions, dynamics during pipe-lay, code criteria software, example analysis

### Pipe lifting
- Static and dynamic loads, lifting in air, lifting through wave zone, lowering through water column, lowering onto seabed, worked example exercise

### Rigging design and analysis
- Rigging equipment, rigging analysis, worked example exercise

### Spreader beam design
- Steelwork design process, steelwork design codes, spreader beam design, worked example, exercise, lifting point design, worked example exercise

### Barge stability
- Stable floating bodies, determining vessel stability, free liquid surfaces and suspended loads, worked example exercise

### Anchors and piles
- Anchors, chains, exercise, piles, sheet pile anchorage, worked example exercise

### Abandonment and recovery
- A&R overview, A&R equipment, case study, A&R analysis, exercise

### Exercises and worked examples on:
- J-lay pipe stress, stinger pipe stress, ovalisation, buckle prevention, winch capacity, landfall pull load, frame analysis, strut design code, strop sizing, spool lift, lug stress, crane load, stability, anchor capacity, sheet pile, laydown

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**Course information**

<table>
<thead>
<tr>
<th>Level: Practitioner</th>
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<tbody>
<tr>
<td>Duration: 4 days</td>
</tr>
<tr>
<td>CPD points: 28</td>
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</tbody>
</table>
Reeling design calculations

About the course

This is an in-depth, technical course, detailing the engineering behind reel-lay installation. It explains key design aspects such as the implications of cumulative plastic strain, ovalisation and weld defects.

Receive guidance on codes and patents, learn about the reeling market and understand lessons learned from past successes and failures.

Key learning areas

- Understand key design aspects such as the implications of cumulative plastic strain, ovalisation and weld defects
- Learn about the latest developments, including SENT (single-edge notch tensile) test assessments, the use of lined pipe and lines installed partially pressurised
- Gain knowledge to facilitate assessment of a vessel’s capability in reel-laying
- Gain lessons learned from published case studies throughout the course

Course information

Level: Practitioner
Duration: 4 days
CPD points: 28

“Provided an excellent technical introduction to the pipe reeling process for those new to this subject.”

Martin Gibbens, Construction Support Engineering Manager, McDermott South East Asia

Course content

Reel lay process
Reel-lay system configuration, spooling, installation, lay down

Reeling history and current market
History and development of reeling, reeling ships and companies around the world

Case studies: failures and successes
Canapu pipe-in-pipe success, Asgard field joint buckling failure, Foinaven twisting problem, Tambar stress cracking failure, Nile insulation success, Dahlia spool site set-up success

Key technical aspects
Strain concentration, material qualification, weld defects, ovalisation reeling forces, 13% chrome pipe, clad pipe, plastic-lined pipe

Codes and patents
Codes relating to reeling, around the world, patents relating to reeling

Reeling forces
Force to reel-on, stresses once reeled-on, exercise, elastic energy in reel, force needed to straighten, gripping force, worked example, exercise, stationary versus traversing straightener

Strain concentration effects
Stress-strain curves, effect of strain on material properties, plastic behaviour during reeling, exercise geometric discontinuities, material strength discontinuities, lay process control methods, strain concentrations at discontinuities, exercise, safeguards

Materials and weld defects
Welding methods, welding procedures, inspection methods for welds, defect assessment methods, worked example – crack growth during reeling, exercise – effect of load cycling on root crack weld fatigue life, DNV ECA methodology

Ovalisation
Ovalisation and recovery, collapse pressure and combined loading, worked example, exercise
Integrity management of subsea pipelines
(formerly Integrity management of subsea pipelines – Part 1)

About the course
This course gives an in-depth understanding of the engineering principles behind successful integrity management of subsea pipelines.

Learn about the activities required to run subsea pipelines in optimum conditions and how to identify issues and assess a range of integrity threats using screening tools to undertake detailed evaluations. Case studies and worked examples help facilitate an understanding in key topic areas.

Key learning areas
- Learn how to identify issues and assess a range of integrity threats, including corrosion and dents
- Look at the different detailed calculations required and screening tools available
- Reinforce learning using case studies and worked examples
- Discuss end of design life options, including lifetime extension and decommissioning

This course is really fundamental for pipeline engineering [to] understand the complex assessment of pipeline integrity process.

Carlos Cardoso, Civil Engineer, Petrobras

Course content

<table>
<thead>
<tr>
<th>Pipeline Integrity Management System (PIMS)</th>
<th>Stability</th>
<th>Corrosion overview</th>
<th>Dent assessment</th>
<th>Isolation</th>
</tr>
</thead>
<tbody>
<tr>
<td>What does a PIMS involve?</td>
<td>Pipeline instability, sources of data, conventional force balance approach, dynamic and quasi-static approach, stabilisation options, case studies</td>
<td>Types of corrosion, corrosion rate modelling, corrosion monitoring, control measures, case studies</td>
<td>Dent properties and behaviour, causes of dents in subsea pipelines, methods of assessment, worked example, exercise, protection measures, case study</td>
<td>Operations issues, tethered isolation plugs, remote set isolation pigs, remote set spheres, pipe freezing, high friction pigs, hot tap and stopple, environment and safety</td>
</tr>
<tr>
<td>Spans</td>
<td>Thermal buckling</td>
<td>Internal inspection</td>
<td>Offshore repairs</td>
<td></td>
</tr>
<tr>
<td>Span detection, assessment of spans, stress and buckle checks, vortex-induced vibrations, remedial measures</td>
<td>What is a thermal buckle? Why are they a problem? Assessment, mitigation and remediation</td>
<td>Gauge pig, calliper pig, magnetic flux pig, ultrasonic pig, inspection of flexibles, other pigs, case study</td>
<td>Composite repairs, clamp repairs, spool repairs, mechanical connectors, hyperbaric welding, others</td>
<td></td>
</tr>
<tr>
<td>Pigging</td>
<td>Flow assurance</td>
<td>External inspection</td>
<td>Life extension and decommissioning</td>
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</tr>
<tr>
<td>Types of pigs, piggability of pipelines, pig suitability, launching and receiving</td>
<td>Introduction to flow assurance, flow regime, causes of flow restriction, flow control methods</td>
<td>Introduction, what to look for, inspection methods, riser and flexible inspection, pig trap inspection, risk-based inspection</td>
<td>Ageing assets and KP4, pipeline design life, pipeline life extension, pipeline decommissioning, decommissioning regulations, decommissioning options, decommissioning process</td>
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</tbody>
</table>

Exercises and worked examples on:
- Span VIV screening criteria, external inspection, stability assessment, upheaval buckling, defect assessment, survey results
Failure of deepwater pipelines and risers –
A masterclass in risk mitigation
(formerly Integrity management of subsea pipelines- Part 2)

About the course
This course builds an in-depth technical knowledge of integrity management issues affecting deepwater risers and flowlines. Learn directly from case studies of real pipeline failures, reviewing why the failures occurred and understanding how lessons learned can be applied to your pipelines.

Delegates will develop an understanding of efficient ways to perform integrity assessments and manage corrosion defects in order to ‘build’ integrity into all phases of offshore pipeline projects to improve operating costs and reduce the risk of pipeline failure.

Key learning areas
✦ Understanding of efficient ways to perform integrity assessments
✦ Manage corrosion defects to improve operating costs
✦ Reduce risk of pipeline failure
✦ How lessons learned can be applied to your pipeline and riser projects

Course information
Level: Practitioner
Duration: 4 days
CPD points: 28

Course content
Integrity management systems
Integrity management strategy, plan, execute, measure, improve, document management and reporting, risk-based inspection, emergency response, incident investigation and learning, integrity management standards

Integrity during design and installation
Rigid pipeline design, rigid riser design, rigid pipeline installation, rigid riser installation, commissioning

Case study 1: Pipeline installation failure
Pipeline installation failure, failure investigation, pipeline repair, lessons learned

Integrity during operation
Flow assurance, operation and remediation, inspection methods

Case study 2: Pipe-in-pipe installation and operational failure
Field development, flowline design, flowline installation, riser design, riser installation, failure detection, failure causes and consequences, repair options, lessons learned

Case study 3: Pipe-in-pipe failure during operation
Pipeline design, pipeline failure, pipeline repair options, new pipeline, lessons learned

Case study 4: Pipeline operational failure
Background to the problem, buoyant span assessment, remedial works, lessons learnt

Flexible integrity management
Codes and standards, materials and makeup, inspection techniques, monitoring and testing methods, design and installation incidents, operational deterioration and damage

Case study 5: Flow-induced pulsations
FLIP – theory and dependencies, potential problems, corrective actions – discussion, lessons learned

Integrity management of umbilicals
Umbilical failure statistics, integrity management in design, integrity management in manufacture, integrity management in installation, integrity management in operation

Case study 6: Umbilical failure
Introduction to Hudson Field, blockage in inhibitor hoses, blockage in methanol hose, lessons learned

Good opportunity to share experiences and discuss study cases on relevant issues.

Wallace Bartholomeu E Silva, Subsea Maintenance and Inspection Manager, Petrobras
Pigging and plugging

About the course
This course provides a comprehensive understanding of how to use pipeline pigs and plugs to perform a variety of operations. It includes the latest thinking on improving the reliability and accuracy of pigging for both cleaning and inspection purposes.

Key learning areas
- Gain a comprehensive understanding of the operation of pipeline pigs and isolation plugs
- Understand the different types of pigs and plugs that are available, when and how they are used
- Gain knowledge of the different problems that can occur when pigging and how they can be resolved
- Build knowledge of related industry terms and acronyms

Jee’s tutors are experienced and knowledgeable in all areas of the course material and are able to share personal experiences beyond the course syllabus.

Krista Parsons, Engineer, Subsea 7

Course information
Level: Foundation
Duration: 2 days
CPD points: 14

Course content
Flow assurance
Introduction to flow assurance, causes of flow restriction, flow control methods, routine operations, operational controls, hydrates and wax, corrosion and erosion, particular flow assurance risks arising during pigging

Piggability of pipelines
Assessing pipeline piggability, piggability assessments, modifications to pipelines to enable pigging, piggability of key pipeline features, pig trap components, suitability of pig traps and associated pigging equipment, design codes

Pig design
Types of pigs, how pigs function, common design approaches for pigs, common issues in pig design, pig design validation, critical aspects of pig design, onshore trials, passage of check valves

Pigging programmes
Operational pigging, pigging strategies, pipeline cleaning, pig order, overview of inspection programmes, quality control in pigging programmes, HSE considerations, pig signalling and tracking, dealing with stuck pigs

Launching and receiving pigs
Principles of pig launching and receiving, leak testing, HSE considerations, pig speed, typical North Sea pigging procedures, general pigging mistakes

Plug design
Types of isolation plug, how plugs work, plug deployment and retrieval tools

Plug deployment
Methods of plug deployment, setting a plug, monitoring a plug, retrieving a plug, retrieving stuck plugs

Pipeline inspection tools
Caliper pigs, magnetic flux leakage pigs, ultrasonic inspection pigs, case-study

Jee's tutors are experienced and knowledgeable in all areas of the course material and are able to share personal experiences beyond the course syllabus.

Krista Parsons, Engineer, Subsea 7

P&P
Free spans and on-bottom stability

About the course
This course gives an expert level of understanding of spans and stability.
It extends the knowledge of spans and stability assessment gained in the Design
of subsea pipelines course, to include detailed Level 2 and 3 assessment to DNV
RP F105 and F109. These detailed assessments can be used for new pipelines as
well as for existing pipelines.

Key learning areas
✦ Gain an appreciation of the integrity issues associated with pipeline instability, spans and dents
✦ Learn about the assessment methods available and how to apply them
✦ Understand when remediation is required and the options available
✦ Perform example assessments, based on industry codes and standards
✦ Review a series of case studies presenting real-life problems and the lessons
learned in their solution

Course information
| Level: Practitioner | Duration: 2 days | CPD points: 14 |

Relevant topics, excellent course notes, very informative class.
Adeolu Ariyo, Installation Team, Chevron Upstream Europe

Course content

External inspection
What to look for, inspection methods, inspection examples

On-bottom stability
Fundamentals of pipeline stability, analysis methods, data requirements, force balance
approach, DNV RP F109 approach, stabilisation options, exercise, case study

Buoyant span case study
Background to the problem, buoyant span assessment, remedial works, lessons learned

Dent assessment
Dent properties and behaviour, causes of dents in subsea pipelines, methods of assessment, worked
example, exercise, protection methods, case studies

Spans
Span detection, assessment of spans, stress and buckle checks, vortex-induced vibrations, remediation

Span assessment software
DNV FatFree, Plus-One, SAGE Profile, FEA, calculations, comparison

Span assessment exercise
Typical span assessment problem, span assessment exercise, scope for remedial action
Flow assurance

About the course
Flow assurance is often seen as a 'black box' by engineers, however this need not be the case. This course provides a rounded introduction to the subject to dispel the myths and explain the general principles.

Key learning areas
- Understand fluid flow principles for liquid, gas and multi-phase flow
- Learn about the causes of flow restriction and methods for managing flow control
- Gain a comprehensive understanding of pigging and the importance of design considerations for pigging operations
- Build knowledge on the types of corrosion and how to predict corrosion problems
- Learn about the subsea equipment that can be used to improve flow performance

Course information
Level: Foundation
Duration: 2 days
CPD points: 14

Loan Venkatapen, Engineer, Total E&P France

Course content
Fluid flow principles
- Flow fundamentals, liquid flow, gas flow, multi-phase flow, turn-down over field life

Fluid composition
- Fluid properties, well bore fluids, export lines

Causes of flow restriction
- Waxes, asphaltenes, scales, hydrates, sand, emulsions and foams

Flow control methods
- Chemical additive control, thermal control, pressure control, mechanical intervention, other control methods

Thermal design
- Need for thermal design, fundamentals, thermal profile analysis, cooldown during shut-in, insulation design

Pigging
- Cleaning pigs, inspection pigs, design for pigging

Corrosion and erosion
- Types of corrosion, control measures, corrosion rate modelling, corrosion monitoring, erosion, case studies

Subsea equipment
- Gas lift, subsea pumps and compressors, subsea separation and water re-injection
Polymers and composites

About the course
Polymers and composites offer the benefits of being lightweight and corrosion resistant and are being increasingly used offshore. This course gives an understanding of polymers and composites, from manufacturing to failure and includes lots of real life examples.

Key learning areas
- Learn about the latest materials, manufacturing methods and project costings
- Gain an understanding of relevant industry codes and standards
- Build knowledge of materials selection, testing and installation considerations
- Learn from real-life case studies throughout the course

The tutor had excellent knowledge and great delivery.
Milton D’Roza, Senior Contract Specialist, Woodside Energy

Course information

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<td>CPD points</td>
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Course content

Material production
Fibres and resins, manufacturing methods, prices

Properties
Strength and stiffness, fatigue, creep and impact resistance, chemical resistance, thermal properties, electrical properties, fire resistance

Design and fabrication
Standards and codes, materials selection, effect of anisotropy, fire and static electricity, parts consolidation, jointing, non-destructive examination, installation considerations

Case studies
Whole topsides in composites, repair and strengthening, downhole tubing and casing, development of flexibles, subsea structures and protection, composite riser
Introduction to the offshore wind industry

About the course
This course provides a complete overview of the offshore wind industry from its origins and the principles of power generation, through to the design, construction and operation of a modern day offshore wind farm. If you are new to this industry and wonder how it all works, this is the course for you!

Key learning areas
- Learn about the offshore wind market and state of the industry
- Gain insight into the principles of engineering used for an offshore wind farm project
- Understand step-by-step how offshore wind farms are designed, built, operated and maintained
- Gain an insight into the future trends and developments in the industry
- Get to grip with industry terms and acronyms

“ My tutor was hugely experienced. He communicated a load of information, along with examples, that helped me to grasp what was covered. 

Amit Rajani, Senior Process Engineer, Genesis Oil and Gas

Course content
Offshore wind market overview
History, market drivers and policy, technological trends, today’s marketplace

Design
Consenting, principles of power generation and transmission, major components of an offshore wind farm, field layouts, wind turbine generators, cables and offshore substations

Construction
Manufacture of main components, logistics, installation of major components

Operations and maintenance
Availability and reliability, accessibility, planned and unplanned maintenance

Future trends
Deeper water, further offshore, new technologies

Course information
Level: Foundation
Duration: 1 day
CPD points: 7
Subsea power cable installation

About the course
This is an in-depth, technical course detailing the engineering for power cable installation using surface laying, ploughing and ROV burial including pull into offshore structures and landfalls.

Gain a detailed understanding of the engineering principles behind cable installation and learn from case studies and worked examples to be able to identify and solve issues related to subsea cable laying with confidence.

Key learning areas
- Understand how to select the correct route for a cable
- Discuss ways to ensure cable protection is optimised
- Learn about a variety of installation methods
- Use worked examples to learn principles of installation analysis

A great balance between coverage of theory, applications and analysis and practical advice and anecdotes from the field.

Ivan Volzhskiy, Engineer, 2H Offshore Engineering

Course content

- **Project overview**
  Typical project structure, feasibility studies, consenting, environmental impact studies, geophysical surveys, geotechnical surveys, route selection, cable production, installation, post-lay activities

- **Cable routing**
  Selection of route corridor, geophysical survey, route determination, charting, geotechnical survey, burial methods, burial performance prediction

- **Cable design**
  Cable types for array, export and interconnectors, design qualification, cable performance characteristics, hauling devices and joints

- **Cable installation**
  Pre-installation design and analysis, types of vessel, deck layouts and key installation equipment, surface laying, plough burial, ROV burial

- **Offshore structure connection**
  Cable entry types, entry protection, internal cable management, pull-in analysis, installation equipment and methods

- **Landfalls**
  Landfall selection, horizontal directional drilled installation process, surface lay and trenched process, landfall joint bay

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Course information

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Book a course: www.jee.co.uk  e: training@jee.co.uk  t: +44 1732 371 391
Meet our tutors

Our courses are written by engineers, for engineers – we understand what you need to know to do your job. Which is why our tutors are all practising, chartered engineers with decades of experience in the subsea industry - you really are learning from the subsea experts.

**Mike Hawkins**  
*Btech (Hons) CEng FimechE*  
**Technical Director**  
Mike has over 25 years’ experience in the design, construction and operation of pipelines. He has particular expertise in conceptual and detailed design of pipeline and rigid riser systems, computer analysis of fluid, mechanical, structural, soils and thermal problems, upheaval and lateral buckling, analysis of freespans, vortex-induced vibrations and fatigue assessment, risk and reliability analysis and FE analysis.

**Jonathan Franklin**  
*BEng (Hons) FimechE MCM CI mgr CEng*  
**Lead Trainer**  
Jonathan has over 18 years’ experience of pipeline engineering studies and project work in the subsea industry. He has expertise in pipeline span assessment, remnant life assessment, onshore pipeline design, subsea LNG pipelines, failure investigation, pipeline integrity management, subsea insulation systems, defect assessment and deep and ultra-deepwater pipeline design.

**Alan G Knowles**  
*BSc (Hons) CEng MICE Eur Ing*  
**Civil and Construction Specialist**  
Alan has over 25 years’ experience in the design and construction of offshore pipelines and landfalls. He specialises in installation methods for subsea pipelines, design and specification of onshore and offshore pipelines, soil assessment for pipeline trenching, burial and pile design, calculations for coated pipelines with regard to stability and thermal insulation and subsea pipe bundles.

**Dr Phil Medlicott**  
*BSc PhD CEng IMechE*  
**Principal Engineer**  
Phil has 30 years’ experience with almost 15 years’ in pipeline studies for the oil and gas industry. He has particular expertise in FEED studies, pipeline piggability studies, pipeline stability analysis, trawl gear interaction with pipelines, verification, design and cost studies of alternative subsea pipeline and umbilical schemes and determining suitability of mechanical connectors for S and J-lay.

**Stuart Joynson**  
*BSc (Hons)*  
**Offshore Construction Specialist**  
Stuart has over 35 years’ experience in offshore pipeline design and construction. Stuart’s particular expertise includes subsea trenching, flowline bundle fabrication and installation, landfall construction, offshore pipeline installation, marine outfalls, tanker terminals, offshore renewables, pipeline refurbishment and decommissioning activities.

**Stan Stirton**  
*FimarEst*  
**Principal Engineer and Courses Specialist**  
Stan has over 35 years’ experience in the oil and gas industry in both project and inspection, maintenance and repair (IMR) roles, including 15 years as IMR Team Leader on Shell’s Subsea facilities. He has lectured on a regular basis since 1999. Stan has particular expertise in subsea control systems and brings his extensive experience to the classroom.
John Hammond
CEng, A.Met, MSc, MIMMM, F.Weld
Principal Engineer and Courses Specialist
John Hammond is a chartered engineer with over 40 years’ experience including 25 years as a metallurgist and welding engineer in the oil industry, applied to upstream oil developments both onshore and offshore in structures, terminals and pipelines.

Mark Murawiecki
CEng, FIMechE
Courses Specialist
Mark Murawiecki is a chartered engineer with over 30 years’ technical and commercial experience in the subsea oil and gas industry. Mark has particular expertise in subsea production systems, subsea field architecture optimisation, offshore drilling systems as well as an appreciation of topsides process plant and equipment and their effect on subsea facilities.

Nigel Wright
CEng, MSc, BSc
Courses Specialist
Nigel Wright is an experienced chartered engineer who has worked in the oil and gas industry since 1973. Nigel has 27 years experience in subsea engineering, covering pipeline design and emergency repair systems. Nigel has extensive knowledge in remote seabed excavation, concrete weight coating removal and mechanical repair systems.

Bob Summers
Courses Specialist
Bob specialises in training for offshore production control systems operators, engineers and technicians. He joined the oil and gas industry in 1996, tasked with the challenge of developing a training and competence programme for a major oil company. He has since travelled the world delivering and advising on competence programmes for multi-national service and maintenance teams.

New tutors for 2014

Alan Smith
BSc (Eng) Hons, PhD, CEng, FIMechE, MIProdE
Courses Specialist
Alan is a chartered engineer with over 15 years’ experience in the industry. He has particular expertise in integrity management and corrosion assessment, structural analysis, defect assessment and stress analysis.

Brian Redden
MCMI, FSUT
Courses Specialist
Brian Redden has extensive experience of the offshore subsea manned and remote intervention contracting sector of the oil & gas industry after joining it in 1994. In the last decade he’s also been active in renewables, developing deepwater offshore windfarms.

Alan Lowdon
BSc (Hons), PhD, MBA, MSc, CEng, MIProdE
Courses Specialist
Alan Lowdon has been in the energy and utilities industries for over 25 years, covering power generation, gas, water, oil and renewables. Alan has experience in advanced mathematical modelling, development of onshore wind operations and maintenance, cable development, mentoring, R&D and technology commercialisation. Alan also has experience of executive education and a background in mechanics.

Clive Ward
BSc, MInst, MDT
Courses Specialist
Clive Ward is an experienced integrity consultant with expert knowledge of integrity management, risk management, and in-line inspection technologies. Clive has been in the industry for more than 30 years and brings a wealth of experience with him to the classroom.

To view our tutors full profiles please visit www.jee.co.uk
Contact Jee

Course enquiries and bookings
To discuss your training requirements, please call us on one of the numbers below, or visit www.jee.co.uk for further details.

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jamie.burrows@jee.co.uk

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