

oncourse

www.esd-simulation.com



TRAINING FOR THE PROCESS INDUSTRIES

in-company or open access training?

Our open access training courses run throughout the year in a variety of locations worldwide. All dates and venues are pre-set and can be obtained either on our website or by contacting your nearest ESD office.

Alternatively you may wish to consider holding an in-company course specific to your own needs, conducted at your premises for your own personnel. These courses can prove to be very cost-effective and will be arranged at a mutually convenient time - wherever you are!

Whichever choice you make, you can be sure that ESD Simulation Training courses are of the highest standard, with quality control being our number one priority.

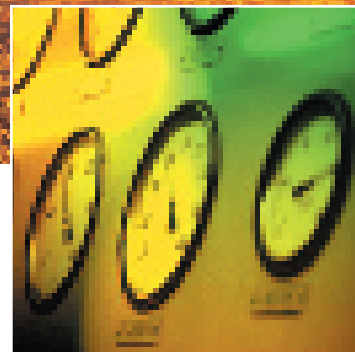
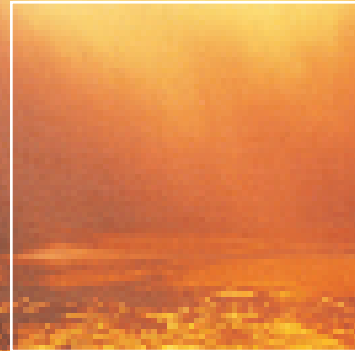
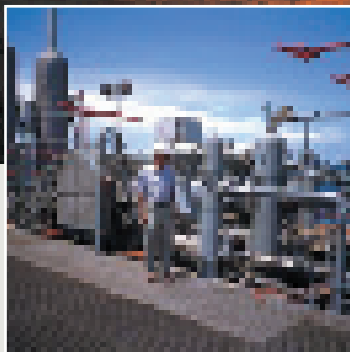
introduction

ESD Simulation Training is a leading international training company providing technical training to the process industries. With offices in Aberdeen (UK), Perth (Australia), Kelowna and Calgary (Canada) and Houston (USA), ESD is well placed to deliver training on a global basis, regularly running courses in a wide variety of locations.

ESD delivers training using the latest dynamic simulation techniques whereby delegates are able to experience and solve real life problems for themselves. A centrifugal compressor going into surge; an abnormal compressor shutdown; changing the tuning constants on a PID controller; the clearance pocket volumes on a reciprocating compressor; or the size of an anti-surge recycle valve. These are just some of the topics explored using these hands-on, real time methods.

Rather than lecture constantly, ESD courses are broken into 40 minute sessions comprising lectures, simulation model exercises, videos, CBT + multi-media training packages and group discussions. With the emphasis on practical, hands-on training, ESD courses enable delegates to return to their workplace feeling confident in applying their knowledge with a much deeper understanding.

Many ESD courses are approved by the IChemE and form part of their Continuing Education Programme. This approval involves a rigid process for initial acceptance and necessitates ongoing monitoring by the Institute ensuring their standards are adhered to. This ongoing quality control coupled with the fact that all ESD course lecturers are qualified engineers with extensive industry experience, has enabled ESD to enjoy an unrivalled reputation for delivering high calibre technical training.



compressors

ESD is widely recognised as the industry leader for compressor training. Our comprehensive range of compressor courses will ensure that no matter what type of equipment you have, the training needs of your personnel will be catered for. Our open access programme includes courses on the following types of equipment:-

- centrifugal gas compressors
- reciprocating gas compressors
- screw compressors
- anti-surge control
- industrial gas turbines

Typically our generic compressor courses cover the control, operation & design of the equipment and are designed for both engineers and operations personnel who are involved or responsible for the day to day running of the equipment. Should you wish the content to be more specific in nature, covering your individual requirements, we are able to tailor the courses to be run on an in-house basis. Also included in our programme are courses on both the mechanical aspects and maintenance of compressors. If you are involved in the maintenance or inspection of compressors or perhaps would benefit from greater troubleshooting and diagnostic skills, then these courses are for you.

process control

ESD has designed a range of training courses on process control systems which have been delivered on an in-house basis for a number of well known companies worldwide. ESD also offers generic process control training as part of our open access programme. These highly successful courses have been designed to give a practical introduction to the principles of measurement and control of a process plant. They offer the opportunity to explore the set-up and tuning of control loops using simulation and other computer based training packages. Developed for both graduates and operators alike, the courses are useful to anyone working in the process industries who wish to understand the techniques of measurement and control. The courses are also ideal for anyone who has never really understood process control and is maybe a little frightened of it...

If you wish to go one stage further, then our Advanced Process Control courses will be more suitable. These advanced courses are designed to offer a more in-depth knowledge in the subject of control and are ideal for those who wish to increase their awareness of the benefits and efforts involved in implementing advanced control strategies. ESD also delivers process control training to the Pharmaceutical Industry where the focus is on the principle types of control techniques used in the manufacture of Pharmaceutical products.



oil & gas

A wide variety of training courses offered by ESD come under this industry specific category. We offer a highly popular open access programme together with a number of courses which are run on an in-company basis only.

Below is a list of some of the courses on offer:-

Production, Process & Emergency Systems on oil & gas installations
Hydrates & Hydrogen Sulphide
Subsea Systems
Well Management & Artificial Lift
Glycol Dehydration
Natural Gas Treatment Processes

Some of the courses in this section are suitable for people of all engineering disciplines who have little experience of production or processing. Others are more specific and will appeal to those who already have a certain level of experience and knowledge in their particular field.

To help decide which of our courses are right for you, all have detailed course outlines stating the target audience and topics covered and are available on request.

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FPSO's

ESD has long since recognised FPSO's as a fast growing sector of the oil & gas industry. Our generic FPSO courses are offered on a regular basis and are presented in a manner to reflect what might be considered a standard project development path. Encompassing the areas of technology, engineering, project management and legislation, these courses are designed for a wide range of personnel whose work scope involves the specification, design, management or operations of FPSO projects.

Vessel specific training represents a large percentage of the FPSO training ESD undertakes, with many of the well known FPSO's currently in service having received their training from our team of experts. Typically a series of courses will be designed for both engineer and operator levels, providing a comprehensive study of the particular field's development and engineering choices considered.

Functional requirements, mooring technology, subsea completions and marine systems are all topics covered together with process training, compressor training and safety case awareness. Not forgetting of course, the full colour technical manuals produced which serve as a comprehensive manual of the entire FPSO operations.

non technical

This range of courses has been developed for those without an engineering background - typically, HR, administration, secretarial and finance disciplines.

All courses are one day in length and are designed to provide delegates with a greater understanding of the oil & gas industry. A variety of courses are available covering the following subjects:-

- overview of the main sectors of the oil & gas industry
- overview of FPSO's (floating, production, storage, offloading)
- overview of drilling & reservoir engineering
- overview of subsea systems

So, if you struggle a little with some of the terminology, then rest assured, all ESD non-technical courses will explain the main activities and technology in a clear and concise manner.

Several new starts? A few employees who would benefit from extra knowledge? All ESD courses in the non technical range are run in-house at very competitive rates - just contact your nearest ESD office on the back of this brochure to enquire.

central control room operations simulator

An exciting recent development for ESD has been to take ownership of its own control room simulator. Reflecting the behaviour of a real plant, this process model consists of the main process areas typically found on an oil & gas plant. From starting up the plant, bringing it to full production and then shutting it down again, all operations are able to be performed in a controlled way using the ESD production simulator.

Perfect for all Control Room Operators, the areas covered using the simulator include:-

- wellhead operation
- gas/oil separation
- gas compression
- DCS operation
- operating procedures
- troubleshooting
- handling of abnormal conditions
- oil export system
- communication
- ESD systems
- Fire & Gas Systems
- Emergency Response Assistance
- Aptitude Assessment

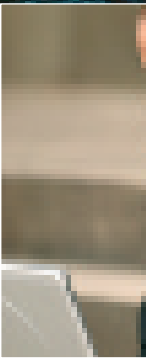
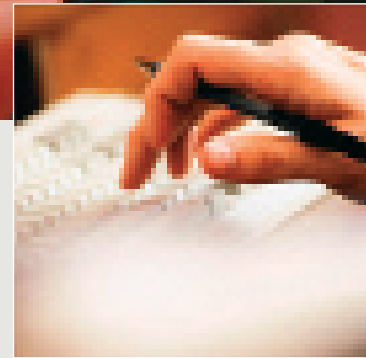
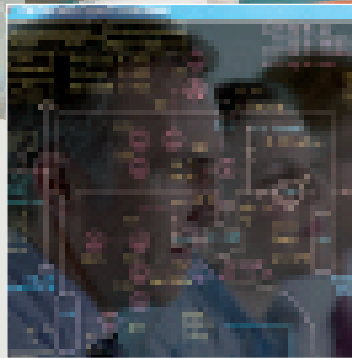
simulation models

ESD is one of the few companies who use dynamic simulation for training, particularly for training people in control & operation of compression equipment.

Recognising that the most effective training medium is a controlled, on-the-job facility, ESD dynamic simulation courses enable trainees of varying abilities and competencies to experience, explore and solve real-life problems without risk to themselves or capital equipment. Abnormal compressor shutdown, clearance pocket volumes and anti-surge recycle valves are some of the topics explored using ESD's hands-on, real-time simulation methods. A selection of some of the most widely used dynamic simulation models follows:-

Centrifugal Variable Speed Compressor

A gas turbine driven variable speed compressor model with suction pressure control and a Flow-DeltaP anti-surge control system. Start-up of the compression system is possible and the anti-surge control system can be set-up and tuned. The model has several different shut-down options, including hot gas unloading and discharge flare valves.



Compressor Controls Corporation (CCC) Training Simulator (Series 5 with trainview)

A full function training simulator of two parallel single stage (fixed or variable speed) compressors with Series 5 anti-surge, load sharing and performance controllers.

The simulator can be used to demonstrate the performance of the CCC control system, how compressors move on their curves and the impact of changes in pressure, temperature and composition on a centrifugal compressor. Load sharing and balancing can be demonstrated and studied. Tuning of the CCC controllers can be carried out.

This simulator also includes a Steam Turbine and a Gas Turbine driven compressor with full control systems for both the compressor and turbine. The concept of total train control can be explored.

training facility

Opened in 2006, ESD is pleased to offer its own purpose built, state of the art training facilities alongside the UK offices just outside Aberdeen, Scotland. Conveniently situated just 15 minutes from Aberdeen's Dyce airport, the facility has been designed to the highest of standards. Offering plenty of natural light, air-conditioning, a full suite of IT equipment and plenty of all-important parking spaces.

The facility is used primarily to host ESD's programme of Aberdeen based open-access courses, ensuring uncompromised quality - no interruptions, no late lunches, no lack of parking spaces, all at the correct temperature!

ESD is also pleased to offer these facilities for Aberdeen based clients requiring in-company training. This not only ensures the best environment for those attending the courses, but also prevents the all too often 'pull' on the delegates time for work related issues.

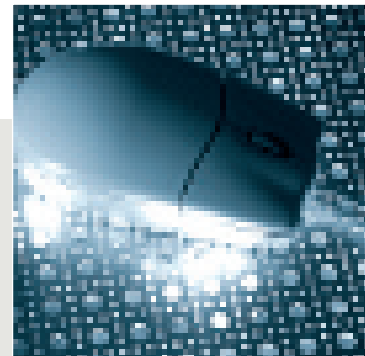
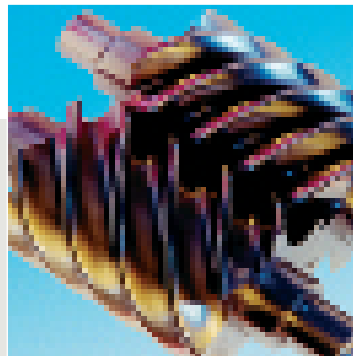
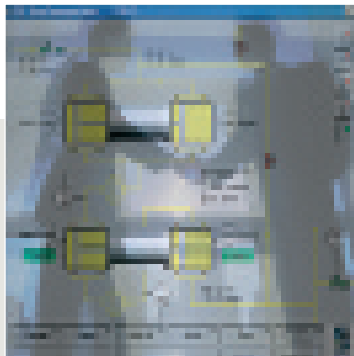
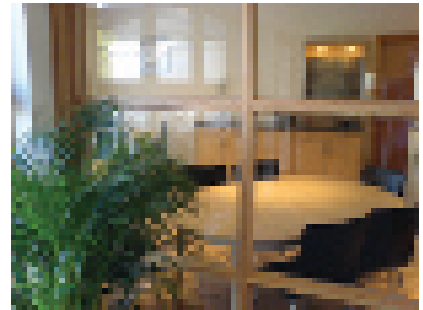
Some comments from satisfied delegates:

"Great modern facilities. Good food, good supply of water & sweets to keep you going – Excellent"

"Lunch was very good"

"Excellent venue"

"Great location and superb facilities"



Multi-stage Reciprocating Compressor

A multi-stage variable speed reciprocating compressor model with variable clearance options. There are several possible control strategies which can be evaluated. It is possible to vary the composition and temperature of gas entering the compression system. The compressor has 4 cylinders and is usually configured as a 3-stage machine. It has 5 step control using unloaders on the head end of each cylinder and fixed volume clearance pockets are fitted to the 2nd and 3rd stage cylinders. Dynamic PV diagrams are provided for each end of each cylinder with a full alarm and trip package included.

Level Control - Cascade

A model which allows the principles of control to be demonstrated including manual, automatic and cascade modes of PID controllers. The model consists of two different water tanks with control strategy variations.

Glycol Dehydration & Regeneration

A high fidelity model of a Tri-Ethylene Glycol (TEG) Glycol Dehydration system which includes a Contractor and Regeneration System with all the associated control systems.

It is possible to vary the feed to the system and change the operating conditions for both the Dehydration and Regeneration sections.

Three Phase Separator

A typical 3-phase separator from an oil production facility. The model contains control loops, alarm settings and relief valves. The effect of varying the pressure, temperature and composition on the separation process can be studied. The model contains two different wells allowing for different feed mixtures.

locations

Truly global, ESD goes pretty much wherever the training is needed! Not only with an extensive public course programme in various locations in the UK, Europe, Australia, USA, Canada, and Asia but also wherever the client requires the training to take place.

With around half of ESD's training being in-company work, the locations are extremely varied, from the northernmost point in the remote outback of Australia, to more well known locations such as Monaco - perhaps one of the technical team's favourites!



regional offices

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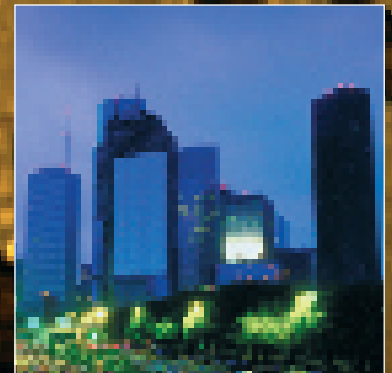
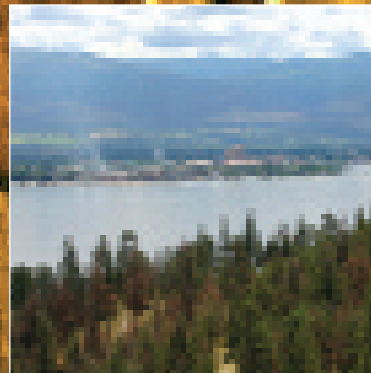
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ESD Trainers

ESD trainers are highly qualified, time-served process engineers with plenty of hands on experience. More than that, they are all highly professional trainers in their own right, having perfected their skills over many years. It is this ability to impart their knowledge that sets ESD trainers apart from the rest, thereby ensuring each trainee receives solid, effective training. Need more convincing? The following is a very small selection of some of the feedback received.

Course: Control & Operation of Centrifugal Gas Compressors

"Best course that I was ever on! Highly recommend it to all - learned more in 3 days than years of study".

"Best course that I have ever done".

Course: Control, Operation & Design of Reciprocating Gas Compressors

"Provides an excellent understanding of compressors - a must for any process engineer".

"Great mix of theory, lecturing & practical examples - very enjoyable".

Course: Production, Processing & Emergency Systems on Oil & Gas Installations

"Well presented, excellent knowledge + clear - an excellent overview".

"Ideal for someone new to the industry - very interesting lecturer with lots of knowledge about subject matter".

"Excellent lecturing - a truly knowledgeable gentleman".

Course: Design & Operation of FPSO's

"Very good course - right content, good duration + will go well with my job in 2006-2007".

Course: Practical Aspects of Process Control & Instrumentation

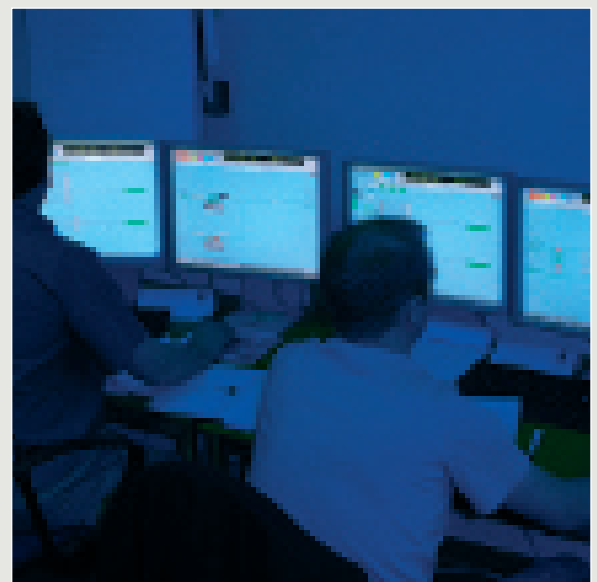
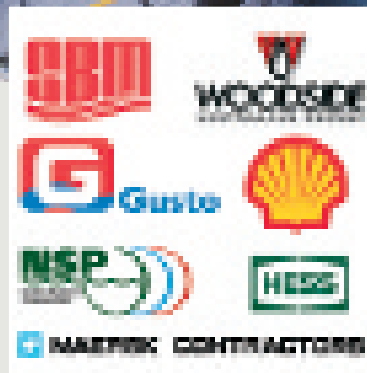
"Lecturer was excellent with a wealth of knowledge - concepts well explained although complex".

"The trainer's level of knowledge was the best I have ever seen - very good course".

Course: Operation of Vacuum Flash Rotating Equipment

"Excellent course, no one slept! Even the material that was over my head was interesting".

"A great teacher: Knows his subject - top notch!



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KELOWNA

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ESD

ESD Simulation Training

Dynamic Simulation Training Specialists

“Approved IChemE Training Provider”



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