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*Additional dates for all courses can be arranged to suit the needs of individual clients*

**Course Planner 2012: The following table shows course commencement dates**

	S1	S2	S3	S4	S5	S6	S8	S9
<b>Jan</b>				23 <sup>rd</sup>			16 <sup>th</sup>	16 <sup>th</sup>
<b>Feb</b>	6 <sup>th</sup>	20 <sup>th</sup>	27 <sup>th</sup>	6 <sup>th</sup> & 20 <sup>th</sup>				1 <sup>st</sup>
<b>Mar</b>	19 <sup>th</sup>	25 <sup>th</sup>		5 <sup>th</sup> & 19 <sup>th</sup>	12 <sup>th</sup>	6 <sup>th</sup>		26 <sup>th</sup>
<b>Apr</b>		30 <sup>th</sup>	2 <sup>nd</sup>	23 <sup>rd</sup>	3 <sup>rd</sup>		16 <sup>th</sup>	10 <sup>th</sup> & 30 <sup>th</sup>
<b>May</b>	1 <sup>st</sup>		3 <sup>rd</sup>	14 <sup>th</sup>			8 <sup>th</sup>	28 <sup>th</sup>
<b>Jun</b>				11 <sup>th</sup> & 25 <sup>th</sup>	18 <sup>th</sup>	21 <sup>st</sup>		6 <sup>th</sup>
<b>Jul</b>	23 <sup>rd</sup>	5 <sup>th</sup>	2 <sup>nd</sup>	9 <sup>th</sup> & 23 <sup>rd</sup>			16 <sup>th</sup>	2 <sup>nd</sup> & 30 <sup>th</sup>
<b>Aug</b>	28 <sup>th</sup>		13 <sup>th</sup>	13 <sup>th</sup>	6 <sup>th</sup>			28 <sup>th</sup>
<b>Sep</b>	24 <sup>th</sup>	13 <sup>th</sup>		10 <sup>th</sup> & 24 <sup>th</sup>		10 <sup>th</sup>	3 <sup>rd</sup>	17 <sup>th</sup>
<b>Oct</b>		15 <sup>th</sup>	16 <sup>th</sup>	8 <sup>th</sup> & 22 <sup>nd</sup>	22 <sup>nd</sup>			1 <sup>st</sup>
<b>Nov</b>	5 <sup>th</sup>			5 <sup>th</sup> & 19 <sup>th</sup>	19 <sup>th</sup>		26 <sup>th</sup>	19 <sup>th</sup> & 28 <sup>th</sup>
<b>Dec</b>	3 <sup>rd</sup>	6 <sup>th</sup>		3 <sup>rd</sup>	10 <sup>th</sup>			

**Course Planner 2012: The following table shows course commencement dates**

	MAR1	MAR2	MAR4/OS4	MAR5	MAR6	IMCA1	IMCA2	IMCA3
<b>Jan</b>			30 <sup>th</sup>					
<b>Feb</b>	1 <sup>st</sup>		13 <sup>th</sup> & 27 <sup>th</sup>	20 <sup>th</sup>	20 <sup>th</sup>			
<b>Mar</b>	7 <sup>th</sup>	15 <sup>th</sup>		19 <sup>th</sup>		14 <sup>th</sup>	19 <sup>th</sup>	26 <sup>th</sup>
<b>Apr</b>		13 <sup>th</sup>	16 <sup>th</sup>					
<b>May</b>	9 <sup>th</sup>	8 <sup>th</sup>	28 <sup>th</sup>		21 <sup>st</sup>			
<b>Jun</b>			18 <sup>th</sup>	18 <sup>th</sup>		13 <sup>th</sup>	18 <sup>th</sup>	25 <sup>th</sup>
<b>Jul</b>	9 <sup>th</sup>	12 <sup>th</sup>	2 <sup>nd</sup> & 16 <sup>th</sup>					
<b>Aug</b>			6 <sup>th</sup> & 20 <sup>th</sup>					
<b>Sep</b>		27 <sup>th</sup>	3 <sup>rd</sup> & 17 <sup>th</sup>	3 <sup>rd</sup>	24 <sup>th</sup>			
<b>Oct</b>	1 <sup>st</sup>		15 <sup>th</sup> & 29 <sup>th</sup>			31 <sup>st</sup>		
<b>Nov</b>		12 <sup>th</sup>	12 <sup>th</sup> & 26 <sup>th</sup>	12 <sup>th</sup>			5 <sup>th</sup>	12 <sup>th</sup>
<b>Dec</b>			10 <sup>th</sup>					

**Course Planner 2012: The following table shows course commencement dates**

	<b>M1</b>	<b>P1</b>	<b>P2</b>	<b>WT4</b>	<b>GEN</b>	<b>ARC</b>	<b>T1</b>
<b>Jan</b>						23 <sup>rd</sup>	30 <sup>th</sup>
<b>Feb</b>	13 <sup>th</sup>	27 <sup>th</sup>	8 <sup>th</sup>		6 <sup>th</sup>		
<b>Mar</b>			29 <sup>th</sup>	5 <sup>th</sup>			26 <sup>th</sup>
<b>Apr</b>		23 <sup>rd</sup>			3 <sup>rd</sup>	2 <sup>nd</sup>	
<b>May</b>		21 <sup>st</sup>	3 <sup>rd</sup>	14 <sup>th</sup>	15 <sup>th</sup>	14 <sup>th</sup>	28 <sup>th</sup>
<b>Jun</b>	11 <sup>th</sup>	25 <sup>th</sup>		25 <sup>th</sup>	6 <sup>th</sup>		
<b>Jul</b>	30 <sup>th</sup>			30 <sup>th</sup>			23 <sup>rd</sup>
<b>Aug</b>		20 <sup>th</sup>	28 <sup>th</sup>			31 <sup>st</sup>	
<b>Sep</b>	17 <sup>th</sup>			10 <sup>th</sup>			
<b>Oct</b>		22 <sup>nd</sup>		8 <sup>th</sup>			1 <sup>st</sup>
<b>Nov</b>			22 <sup>nd</sup>	5 <sup>th</sup>			
<b>Dec</b>							

**Course Planner 2012: The following table shows course commencement dates**

	<b>T2</b>	<b>T3</b>	<b>T5</b>	<b>A1</b>	<b>L1</b>	<b>L2</b>	<b>S11</b>
<b>Jan</b>	31 <sup>st</sup>						16 <sup>th</sup>
<b>Feb</b>		1 <sup>st</sup>	3 <sup>rd</sup>	21 <sup>st</sup>		13 <sup>th</sup>	
<b>Mar</b>	27 <sup>th</sup>	28 <sup>th</sup>	30 <sup>th</sup>	16 <sup>th</sup>	12 <sup>th</sup>		
<b>Apr</b>				13 <sup>th</sup> & 26 <sup>th</sup>			16 <sup>th</sup>
<b>May</b>	29 <sup>th</sup>	30 <sup>th</sup>			8 <sup>th</sup>		21 <sup>st</sup>
<b>Jun</b>			1 <sup>st</sup>	6 <sup>th</sup>			11 <sup>th</sup>
<b>Jul</b>	24 <sup>th</sup>	25 <sup>th</sup>	27 <sup>th</sup>			2 <sup>nd</sup>	
<b>Aug</b>				23 <sup>rd</sup>	20 <sup>th</sup>	13 <sup>th</sup>	6 <sup>th</sup>
<b>Sep</b>				6 <sup>th</sup>			
<b>Oct</b>	2 <sup>nd</sup>	3 <sup>rd</sup>	5 <sup>th</sup>		8 <sup>th</sup>		29 <sup>th</sup>
<b>Nov</b>				22 <sup>nd</sup>		26 <sup>th</sup>	
<b>Dec</b>				13 <sup>th</sup>			

**Course Planner 2012: The following table shows course commencement dates**

	CG2377-01	CG2377-02	C&G 2382-10	C&G 2382-20	C&G AM1	ADIPS	HAZ1	E2
<b>Jan</b>		19 <sup>th</sup>	16 <sup>th</sup>		20 <sup>th</sup>	23 <sup>rd</sup>	30 <sup>th</sup>	
<b>Feb</b>			27 <sup>th</sup>	6 <sup>th</sup>	17 <sup>th</sup>			
<b>Mar</b>				5 <sup>th</sup>	23 <sup>rd</sup>		19 <sup>th</sup>	
<b>Apr</b>	24 <sup>th</sup>	25 <sup>th</sup>	10 <sup>th</sup>	2 <sup>nd</sup>	20 <sup>th</sup>			10 <sup>th</sup>
<b>May</b>			8 <sup>th</sup>		18 <sup>th</sup>	1 <sup>st</sup>		
<b>Jun</b>	7 <sup>th</sup>	8 <sup>th</sup>	18 <sup>th</sup>	21 <sup>st</sup>	22 <sup>nd</sup>			11 <sup>th</sup>
<b>Jul</b>			16 <sup>th</sup>		13 <sup>th</sup>		9 <sup>th</sup>	30 <sup>th</sup>
<b>Aug</b>		16 <sup>th</sup>			17 <sup>th</sup>		28 <sup>th</sup>	
<b>Sep</b>			10 <sup>th</sup>		14 <sup>th</sup>	17 <sup>th</sup>		24 <sup>th</sup>
<b>Oct</b>			15 <sup>th</sup>	18 <sup>th</sup>	12 <sup>th</sup>		22 <sup>nd</sup>	
<b>Nov</b>		1 <sup>st</sup>	12 <sup>th</sup>	15 <sup>th</sup>	16 <sup>th</sup>		19 <sup>th</sup>	5 <sup>th</sup>
<b>Dec</b>					7 <sup>th</sup>			

## **Introduction**

The Faraday Centre Limited is a privately owned company located in the north east of England, specialising in the provision of Electrical Power Training, either at our purpose designed facilities, which are equipped with a wide range of operational high/low voltage electrical training equipment or at the client's site, in the UK and worldwide. Courses are delivered by qualified tutors, all with many years electrical engineering experience.

Courses include practical “hands on” exercises as well as theoretical lectures. An optional individual, comprehensive competence based theoretical and practical assessment is available at additional cost. Candidates successfully completing training courses would receive a Faraday Centre attendance/competence, City & Guilds or EAL (EMTA Awards Ltd) certificate as appropriate.

The preceding calendar details the public courses scheduled for the year 2012, taking place at The Faraday Centre's UK based facilities. Please note that additional dates can be arranged to meet particular needs.

The Faraday Centre is a City & Guilds Approved Centre, EAL Approved (VRQ) Centre, IMCA Member (International Marine Contractors Association), Member of ECA (Electrical Contractors Association), ISO 9001 registered company, a member of RoSPA and British Standards Institution (BSI).

**Thomas-Faraday Training Ltd, Cyprus** is an associated company of the Faraday Centre Ltd UK and was established in 2006 as part of our international expansion. Located in the centre of Limassol, the 6000 square feet (545 square metres) training facility is fully equipped to offer a wide range of electrical training programmes which are identical to those delivered in the UK. Thomas Faraday Training Ltd is the only City & Guilds approved centre to deliver accredited electrical qualifications in Cyprus.

## **Administration**

Course bookings may be made initially by telephone but these should be confirmed by fax, email or letter as well as Course Booking Form prior to the course starting date.

Unless notified to the contrary, courses will commence at 09.00 hours and conclude at 16.30 hours. The course fee includes a light lunch and break time refreshments. With prior notice, special arrangements may be possible to meet specific dietary requirements such as vegetarian, Halal, etc. We will endeavour to meet religious requirements such as prayer mat/quiet room etc. Please note that, in accordance with UK law, smoking is not permitted in any of The Faraday Centre buildings or vehicles and seat belts must be worn when travelling in company vehicles.

## **Contacts**

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E Mail: training@faradaycentre.co.uk  
Website: www.faradaycentre.co.uk

Address: Head Office  
(For all correspondence including Cyprus centre) Unit 3, Stephenson Court, Skippers Lane Industrial Estate  
South Bank, Middlesbrough, TS6 6UT  
United Kingdom

Managing Director: Mr. Barry Thomas  
Financial Director: Mrs. Lynnda D. Thomas  
Group General Manager: Mr. Suhail Mitoubsi  
Training Facilities Manager: Mr. Graham J Wilson  
Course Bookings: Miss Jennifer Millard (Office Manager),  
Miss Alexandra Cockerill  
Accounts: Miss Magdalena Kontek

## **Location**

Middlesbrough – North East England (UK)

By Road : Aberdeen	280 miles	(450 km)
Darlington	18 miles	(28 km)
Glasgow	200 miles	(321 km)
London	270 miles	(434 km)
Manchester	125 miles	(201 km)
Newcastle City	50 miles	(80 km)
Newcastle Airport	52 miles	(83 km)
Durham Tees Valley Airport	15 miles	(24 km)
York	50 miles	(80 km)

International, by air: (Direct flights to Durham Tees Valley Airport from Aberdeen, Dublin and Amsterdam).

Abu Dhabi	3397 miles	(5467 km)
Amsterdam	298 miles	(479 km)
Athens	1700 miles	(2735 km)
Kuala Lumpur	6757 miles	(10874 km)
New York	3640 miles	(5857 km)
Brussels	345 miles	(556 km)
Lagos	3217 miles	(5177 km)
Paris	421 miles	(677 km)
Limassol	2134 miles	(3435 km)

## **Conditions of Sale**

- 1 Course bookings may be made initially by telephone but are not confirmed until receipt of a fully completed and signed order form complete with client's purchase order number. To guarantee availability of places, this confirmation must be received 14 days prior to the course commencement.
- 2 All confirmed bookings will be acknowledged and will include joining instructions, which the clients contact must pass to each of his delegates.
- 3 Clients may substitute candidates, without penalty, up to the course commencement date, providing written notification is received.
- 4 Where bookings include transport/accommodation, it is the client's responsibility to advise The Faraday Centre of local transport requirements at least one week prior to course commencement.
- 5 Where bookings include accommodation, any subsequent cancellation of that accommodation will be subject to the hotel's cancellation policy.
- 6 Liability for full course fees becomes due 7 days prior to the course commencement date. Payment terms must be specified at the time of booking. Failure to pay in the specified time will be subject to the "Late Payment of Commercial Debts (Interest) Act 1998" plus an administrative fee of £50.00 and the withdrawal of any early payment discount offered.
- 7 Failure to specify payment terms will result in fees being charged on the basis of the highest rate in force.
- 8 No fee will be charged for cancellations received in writing by The Faraday Centre Ltd at least 14 days prior to the course commencement. A cancellation charge of 50% of the full course fee will be charged for cancellations within 14 days, and 100% charge for cancellation within 7 days.
- 9 For Faraday based courses, unless stated to the contrary, fees include course manuals, certificates and a light lunch.
- 10 Fees are quoted exclusive of U.K. Government Value Added Tax, which is charged as appropriate and is applicable to all training delivered in the United Kingdom.
- 11 All courses are offered on the basis of there being sufficient candidates to justify holding the course. Where this or other circumstances force The Faraday Centre Ltd to cancel a course, liability shall be limited to a refund of any fees paid and alternative dates suggested.
- 12 Course certificates are despatched to the clients contact following completion of the course and payment of the invoice.
- 13 The Faraday Centre Ltd cannot accept responsibility for the competence level of any particular candidate upon completion of the course.
- 14 Fees for bespoke course are subject to consultation and negotiation.
- 15 All delegates are required to observe the Health & Safety Policy of The Faraday Centre Ltd.
- 16 Unless agreed in writing to the contrary, these conditions of sale shall take precedence over any other contractual conditions for all services supplied by The Faraday Centre Ltd.
- 17 Unsatisfactory account settlement, within the timescale specified, may result in the withdrawal of credit facilities to a defaulting client.
- 18 Persons adversely affected by alcohol/drugs may be prohibited from partaking in the course while so affected.
- 19 These conditions of sale shall be subject to interpretation in accordance with English Law.

## **About City & Guilds**

City & Guilds was founded in 1878 to establish a national system of technical education. It is the UK's leading provider of vocational qualification, offering over 500 awards across a wide range of industries and progressing from entry level to the highest levels of professional achievement.

Through a network of 8500 centres in the UK and 81 countries worldwide, City & Guilds awards over two million certificates every year and demand is growing.

The organisation is recognised by employers worldwide for providing qualifications that offer proof of the skills they need to get the job done.



## **About EAL**

EAL (EMTA Awards Ltd) is the UK's leading awarding body for engineering National Vocational Qualifications (NVQs) and their Scottish equivalents (SVQs). Over 70% of engineering vocational qualifications are awarded by EAL.



EAL offers vocational qualifications to help electrical workers and building services engineers to further their careers and support business growth. As a leading-edge awarding body, EAL works with SummitSkills, the Sector Skills Council for building services, and key organisations like the Electrical Contractors Association (ECA) and Electrical Training Trust (ETT) to help candidates show their competence in various trades.

EAL is recognised by the Qualifications and Curriculum Authority (QCA) and the Scottish Qualifications Authority (SQA).

## Section 1: High Voltage Courses

### S1 Introduction to the Safe Operation of High Voltage Power Systems (Limited High Voltage Authorisation)

**Duration:** 3 days

**Introduction:** This training programme requires a basic level of electrical knowledge. Upon successful completion of the course, subject to client approval, candidates will be able to enter high voltage switchrooms and perform limited switching operations, etc. Upon completion of the course candidates would be assessed to a competency level suitable for an Authorised Person.

**Participants:** Electrical/non-electrical personnel required to carry out restricted HV switching operations with limited safety document issuing responsibilities, up to and including 15kV. Switching at higher voltages may be undertaken at client’s premises.

**Aim:** To introduce personnel to the concept of electrical power systems to enable them to enter substations/switchrooms, carry out restricted switching operations, monitor the performance and condition of the system (including relay operation) in a safe and competent manner. The course is intended to provide knowledge and awareness of limited safety document issuing responsibilities.

#### Outline Contents

- Safety requirements
- Electrical hazards and precautions
- Arrangement of high voltage substations/switchrooms
- Emergency conditions
- Philosophy of high voltage distribution
- Operational and safety features of switchgear
- Statutory Electrical Regulations
- Limited Operational Procedures
- High voltage safety rules
- Introduction to electrical protection
- Practical switching exercise (1)
- Case studies
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

6 <sup>th</sup> – 8 <sup>th</sup> Feb	19 <sup>th</sup> – 21 <sup>st</sup> Mar	1 <sup>st</sup> – 3rd May	23 <sup>rd</sup> – 25 <sup>th</sup> Jul
28 <sup>th</sup> – 30 <sup>th</sup> Aug	24 <sup>th</sup> – 26 <sup>th</sup> Sep	5 <sup>th</sup> – 7 <sup>th</sup> Nov	3 <sup>rd</sup> – 5 <sup>th</sup> Dec

## S2 Awareness of the Operation of High Voltage Power Systems

(Access to Substations & Switchrooms)

**Duration:** 1 day

**Introduction:** Persons who would benefit from this course are those required to work in the vicinity of, but not on electrical power equipment. The course covers the safety requirements for working in the vicinity of High Voltage electrical equipment, it highlights electrical hazards and the precautions necessary to avoid danger. It also covers the arrangement of equipment within substations and switchrooms, in addition to safety procedures, understanding of key safes and Multi Hasp systems and steps to be taken in an emergency.

**Participants:** Electrical/non-electrical personnel with no previous experience of electrical power systems, who require **Restricted** Authorisation to permit access to areas containing High Voltage Electrical Apparatus with a view to undertaking specific duties.

**Aim:** To enable personnel to enter substations and switchrooms for specific duties and to recognise the dangers associated with high voltage power equipment, up to and including 15kV. These duties may include: meter reading, switchroom lighting, telephone repairs, cleaning, etc.

### Outline Contents

- Safety requirements
- Electrical hazards and precautions
- Arrangement of high voltage substations
- Basic high voltage safety procedures
- The role of protective relays
- Emergency conditions
- Demonstration of switchgear principles
- Electrical incidents
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

20 <sup>th</sup> Feb	25 <sup>th</sup> Mar	30 <sup>th</sup> April	5 <sup>th</sup> July
13 <sup>th</sup> Sep	15 <sup>th</sup> Oct	6 <sup>th</sup> Dec	

### S3 Refresher Training in the Safe Operation of High Voltage Power Systems

**Duration:** 2 days

**Introduction:** This is a refresher programme designed for personnel who have limited high voltage authorisation, restricted to switching operations only.

**Participants:** Personnel experienced in carrying out routine switching duties associated with the safe operation of electrical power systems, up to and including 15kV with limited authorisation and have previously attended courses such as the S1.

**Aim:** To provide refresher training to authorised personnel required to carry out routine switching operations and issue of limited safety documents. Refresher training on higher voltages may be undertaken at client’s premises.

#### Outline Contents

- Review Electrical statutory regulations
- Operational Procedures
- Review High Voltage Safety Rules
- Interpretation of basic electrical protection under fault conditions
- Safety documents and lock out/tag out procedures
- Practical switching exercises
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

27 <sup>th</sup> - 28 <sup>th</sup> Feb	2 <sup>nd</sup> – 3 <sup>rd</sup> Apr	3 <sup>rd</sup> – 4 <sup>th</sup> May	2 <sup>nd</sup> – 3 <sup>rd</sup> Jul
13 <sup>th</sup> – 14 <sup>th</sup> Aug	16 <sup>th</sup> – 17 <sup>th</sup> Oct		

**S4 Fundamentals of the Safe Operation of High Voltage Power Systems**  
(Full authorisation)

**Duration:** 5 days

**Introduction:** This training programme requires a good foundation of electrical knowledge. It is designed to bring candidates up to a competency level suitable for Senior Authorised persons. However, the course does not provide the “authorisation” itself, since this must be issued by the plant senior electrical authority.

**Participants:** Personnel who are to be responsible as Senior Authorised Persons for switching and issue of electrical safety documents. Candidates may find it beneficial to attend our S9 Course (page 19) as a pre-cursor to this course.

**Aim:** To provide an understanding of Industrial HV/LV power systems including statutory regulations, safe operation, protection and fault diagnosis on a wide range of power equipment. Also to enable candidates to perform HV switching operations on industrial HV networks up to and including 15kV and to prepare them for HV authorisation in accordance with their companies’ safety rules/regulations. Switching at Higher voltages may be undertaken at client’s premises

**Outline Contents**

- Statutory regulations
- Electrical hazards and precautions
- Arrangement of high voltage systems
- Operational and safety features of switchgear
- High voltage safety rules
- Issue and control of safety documentation
- Safety Lockout Procedures, Key Safes/Multi Hasp locking devices (Isoloks)
- Application of electrical protection
- Protection Practical Fault Exercises
- Emergency conditions
- Practical exercises (3-switching/ safety documents/ Switching Programmes).
- Fault incidents & Case studies

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

23 <sup>rd</sup> - 27 <sup>th</sup> Jan	6 <sup>th</sup> – 10 <sup>th</sup> Feb 20 <sup>th</sup> – 24 <sup>th</sup> Feb	5 <sup>th</sup> – 9 <sup>th</sup> Mar 19 <sup>th</sup> – 23 <sup>rd</sup> Mar	23 <sup>rd</sup> – 27 <sup>th</sup> Apr
14 <sup>th</sup> – 18 <sup>th</sup> May	11 <sup>th</sup> – 15 <sup>th</sup> Jun 25 <sup>th</sup> – 29 <sup>th</sup> Jun	9 <sup>th</sup> – 13 <sup>th</sup> Jul 23 <sup>rd</sup> – 27 <sup>th</sup> Jul	13 <sup>th</sup> – 17 <sup>th</sup> Aug
10 <sup>th</sup> – 14 <sup>th</sup> Sep 24 <sup>th</sup> – 28 <sup>th</sup> Sep	8 <sup>th</sup> – 12 <sup>th</sup> Oct 22 <sup>nd</sup> – 26 <sup>th</sup> Oct	5 <sup>th</sup> – 9 <sup>th</sup> Nov 19 <sup>th</sup> – 23 <sup>rd</sup> Nov	3 <sup>rd</sup> – 7 <sup>th</sup> Dec

## S5            **Advanced Refresher Training in the Safe Operation of High Voltage Power Systems**

**Duration:**     3 days

**Introduction:** This is an advanced training programme that requires a good foundation of electrical knowledge. It is designed to refresh the knowledge, skills and experience of the candidates relating to safe practices and legislation applicable to High Voltage power systems.

**Participants:** Personnel experienced in carrying out High Voltage switching duties up to and including 15kV and testing, as a senior authorised person, associated with the safe operation of electrical power systems and who previously attended a course such as the S4.

**Aim:** To provide refresher training to senior authorised personnel with a responsibility for carrying out High Voltage switching duties and the issue of permits to work/sanctions for test associated with such work.

### **Outline Contents**

- Review Electrical statutory regulations
- Causes of electrical accidents
- Review Electrical hazards and precautions
- Case studies
- Application of electrical protection
- An outline of electrical testing
- Practical exercises
- Fault situations and investigation
- Fault switching exercises
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

12 <sup>th</sup> – 14 <sup>th</sup> Mar	3 <sup>rd</sup> – 5 <sup>th</sup> Apr	18 <sup>th</sup> – 20 <sup>th</sup> Jun	6 <sup>th</sup> – 8 <sup>th</sup> Aug
22 <sup>nd</sup> – 24 <sup>th</sup> Oct	19 <sup>th</sup> - 21 <sup>st</sup> Nov	10 <sup>th</sup> – 12 <sup>th</sup> Dec	

## S6 Safe Operation Review & Competence Assessment

**Duration:** 1 day

**Introduction:** This is a practical programme designed to assess candidates' safe switching practices when operating on High and Low voltage power systems up to and including 15kV. It is intended for candidates requiring independent external assessment of their level of competence and is **not** intended as a training course.

**Participants:** Electrical engineers / supervisors / technicians / electricians responsible for the inspection, operation, maintenance and repair of High and Low voltage power systems.

**Aim:** To assess the competency of electrical personnel prior to becoming an Authorised/Senior Authorised person for safety and operational switching duties of electrical power systems. It includes theoretical, verbal and practical assessments. This is an individual assessment and most dates can be arranged to suit clients' requirements. Assessments of competency at higher voltages may be undertaken at client's premises

### Outline Contents

- Determination of required individual competence levels
- Practical demonstration by tutor of appropriate switchgear including safety features.
- Individual practical competence exercises, including switching/safety document issue, as appropriate.
- Theoretical paper
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday "Competence" certificate. Candidates who fail or do not wish to undertake the competence assessments will receive a Faraday "Attendance" certificate.

**Dates:** For courses undertaken at our UK training centre

6<sup>h</sup> Mar

21<sup>st</sup> June

10<sup>th</sup> Sep

Other dates are available on request.

## S8                    **The Safe Application of High Voltage Electrical Testing & Subsequent Receipt of Sanction for Test Documents**

**Duration:**     3 days

**Introduction:** This course is designed to enable those who are required to carry out testing on high voltage equipment to become authorised to receive sanction for test documents relating to safe practices and legislation applicable to High Voltage power systems up to and including 15kV.

**Participants:** Personnel with prior knowledge of the inspection, operation, maintenance and repair of high voltage electrical power systems, who are to be responsible, as an authorised/senior authorised person, for electrically testing systems following the receipt of sanction for test documents.

**Aim:** To provide candidates with the skill level required to enable them to be authorised to receive sanction for test documents. It is **not** intended to train candidates in various types of testing, e.g. primary/secondary injection, pressure testing, etc.

### **Outline Contents**

- Hazards associated with testing
- Review Statutory Regulations
- Operational and safety features of switchgear
- Safety lockout procedures
- Case studies associated with testing
- Operational procedures
- Proving dead/discharging
- Safety of Operations during testing
- Practical exercises
- Competency assessment
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

16 <sup>th</sup> – 18 <sup>th</sup> Jan	16 <sup>th</sup> – 18 <sup>th</sup> Apr	8 <sup>th</sup> – 10 <sup>th</sup> May	16 <sup>th</sup> – 18 <sup>th</sup> July
3 <sup>rd</sup> – 5 <sup>th</sup> Sep	26 <sup>th</sup> – 28 <sup>th</sup> Nov		

## S9 Practical Introduction to the Safe Operation of High & Low Voltage Switchgear

**Duration:** 3 days

**Introduction:** This course is designed specifically for individuals with little or no previous experience in high voltage switching. It focuses on the practical (hands on) element of Switching and is predominately workshop rather than classroom based. This course should be undertaken as a pre-cursor to the S4/MAR 4 Full authorisation courses.

**Participants:** Electrical/non- electrical personnel who require practical (hands on) experience of switching and issuing of safety documents on high and low voltage power systems up to and including 15kV, prior to undertaking future authorisation courses.

**Aim:** To enable candidates to familiarise themselves with operational protocols and potential physical constraints associated with high voltage power systems, prior to receiving full authorisation training.

### Outline Contents

- Operational procedures
- Single end drive motor isolations
- 11/3.3kV & 11/0.415kV transformer isolations
- Ring mains and ring main units
- Voltage transformer isolation
- Circuit main earth application protocols
- Additional earth application protocols
- Dependent & Independent power operations
- Stored energy operations
- Electrical safety documents
- Key safes and Multi Hasp locking (Isolok) systems
- Abridged high voltage safety rules
- Course review

**Certification:** Candidates will receive a Faraday “Attendance” certificate which should be produced when attending a full authorisation course at a later date.

**Dates:** For courses undertaken at our UK training centre

16 <sup>th</sup> – 18 <sup>th</sup> Jan	1 <sup>st</sup> – 3 <sup>rd</sup> Feb	26 <sup>th</sup> – 28 <sup>th</sup> Mar	10 <sup>th</sup> – 12 <sup>th</sup> Apr 30 <sup>th</sup> Apr – 2 <sup>nd</sup> May
28 <sup>th</sup> – 30 <sup>th</sup> May	6 <sup>th</sup> – 8 <sup>th</sup> Jun	2 <sup>nd</sup> – 4 <sup>th</sup> Jul 30 <sup>th</sup> Jul – 1 <sup>st</sup> Aug	28 <sup>th</sup> – 30 <sup>th</sup> Aug
17 <sup>th</sup> - 19 <sup>th</sup> Sep	1 <sup>st</sup> – 3 <sup>rd</sup> Oct	19 <sup>th</sup> – 21 <sup>st</sup> Nov 28 <sup>th</sup> – 30 <sup>th</sup> Nov	

**MARI Introduction to the Safe Operation of Marine & Offshore High Voltage Power Systems (Limited High Voltage Authorisation)**

**Duration:** 3 days

**Introduction:** This is an intermediate training programme that requires a basic level of electrical knowledge. Upon successful completion of the course and subject to client approval, candidates will be able to enter marine and offshore high voltage switch rooms and perform limited switching operations etc. on high voltage equipment. They would be permitted to issue limited safety documents, e.g. Isolation documents, but not to issue permits to work, sanction for test, etc.

**Participants:** Electrical/non-electrical personnel required to carry out restricted HV switching operations with limited safety document issuing responsibilities.

**Aim:** To introduce personnel to the basic concept of marine/offshore electrical power systems to enable them to enter substations/switch rooms, carry out restricted switching operations; monitor the performance and condition of the system (including relay operation) in a safe and competent manner. The course is intended to provide knowledge and awareness of limited safety document issuing responsibilities.

**Outline Contents**

- Safety requirements
- Electrical hazards and precautions
- Arrangement of high voltage substations/switchrooms
- Power generation in “island systems”
- Emergency conditions
- Philosophy of high voltage distribution
- Operation and safety features of switchgear
- Limited operational procedures
- High voltage safety rules
- Introduction to electrical protection
- Treatment of the system neutral point
- Practical switching exercise (1)
- Case studies
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

1<sup>st</sup> – 3<sup>rd</sup> Feb

7<sup>th</sup> – 9<sup>th</sup> Mar

9<sup>th</sup> – 11<sup>th</sup> May

9<sup>th</sup> – 11<sup>th</sup> Jul

1<sup>st</sup> – 3<sup>rd</sup> Oct

**MAR2 Introduction to the Safe Operation of Marine High Voltage Power Systems in Remote Operated Vehicles (ROVs)**

**Duration:** 1 day

**Introduction:** This is an intermediate training programme that requires a basic level of electrical knowledge. Upon successful completion of the course, candidates will be able to enter the electrical compartments of ROV systems to carry out service operations. The course will provide candidates with information about the safety procedures required to ensure that the high voltage systems are isolated, proved dead and earthed. (The MAR 2 course progresses to the MAR1 course, if more advanced training is required.)

**Participants:** Electrical/non electrical personnel required to carry out service and maintenance operations on ROV electrical equipment.

**Aim:** To introduce personnel to the basic concept of the safe operation of high voltage electrical power systems which are embedded in ROV systems. On successful completion of the course candidates are expected to be able to work safely in the ROV electrical environment.

**Outline Contents**

- Safety requirements
- Electrical hazards and precautions
- Arrangement of high voltage equipment in ROV systems
- Philosophy of high voltage distribution
- Limited operational procedures relevant to ROV systems
- High voltage safety rules
- Practical system isolation exercise
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

15 <sup>th</sup> Mar	13 <sup>th</sup> Apr	8 <sup>th</sup> May	12 <sup>th</sup> Jul
27 <sup>th</sup> Sep	12 <sup>th</sup> Nov		

## MAR4/OS4 Fundamentals of the Safe Operation of Marine/Offshore High Voltage Power Systems

**Duration:** 5 days

**Introduction:** This training programme requires a good foundation of electrical knowledge. It is designed to bring candidates up to a competency level suitable for Senior Authorised Persons. However, the course does not provide the “authorisation” itself. This must be provided by the client and based upon the Faraday Centre recommendation. The course is a marine/ offshore development from our S4 course.

**Participants:** Marine/offshore personnel with a prior knowledge of the inspection, operation, maintenance, and repair of high voltage systems and who are to be responsible for switching and issue of safety documents (such as electrical permits to work).

**Aim:** To improve the understanding of HV/LV power systems including statutory regulations, safe operation, protection, maintenance and fault diagnosis on a wide range of marine/offshore power equipment. Also to enable candidates to perform HV switching operations on marine offshore power equipment and to prepare them for HV authorisation in accordance with their companies’ safety rules/regulations.

### Outline Contents

- UK and other national marine/offshore statutory electrical regulations.
- Electrical hazards and precautions
- Arrangement of high voltage switchrooms.
- Operation and safety features of switchgear & Operational Procedures.
- Marine/offshore high voltage safety rules.
- Issue and control of safety documentation
- Safety Lockout Procedure, Key Safes/Multi Hasp locking device (Isoloks).
- Treatment of system neutral point
- Appreciation of fault levels.
- Marine/offshore application of electrical protection.
- Emergency conditions.
- Practical exercises (3-switching/ safety documents/ synchronisation).
- Case studies.

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

30 <sup>th</sup> Jan – 3 <sup>rd</sup> Feb	13 <sup>th</sup> – 17 <sup>th</sup> Feb 27 <sup>th</sup> Feb – 2 <sup>nd</sup> Mar	16 <sup>th</sup> – 20 <sup>th</sup> Apr	28 <sup>th</sup> May – 1 <sup>st</sup> Jun
18 <sup>th</sup> – 22 <sup>nd</sup> Jun	2 <sup>nd</sup> – 6 <sup>th</sup> Jul 16 <sup>th</sup> – 20 <sup>th</sup> Jul	6 <sup>th</sup> – 10 <sup>th</sup> Aug 20 <sup>th</sup> – 24 <sup>th</sup> Aug	3 <sup>rd</sup> – 7 <sup>th</sup> Sep 17 <sup>th</sup> – 21 <sup>st</sup> Sep
15 <sup>th</sup> – 19 <sup>th</sup> Oct 29 <sup>th</sup> Oct – 2 <sup>nd</sup> Nov	12 <sup>th</sup> – 16 <sup>th</sup> Nov 26 <sup>th</sup> – 30 <sup>th</sup> Nov	10 <sup>th</sup> – 14 <sup>th</sup> Dec	

## MAR 5 Principles of the Safe Operation of Marine/Offshore High Voltage Power Systems

**Duration:** 5 days

**Introduction:** This is an advanced training programme that requires a good foundation of electrical knowledge and experience of high voltage Power systems.

**Participants:** Electrical engineers, electrical officers and contract electrical engineering staff, responsible for the construction, commissioning and operation of marine/offshore electrical power systems, and to be responsible for switching and the issue of safety documents.

**Aim:** This course has been developed to meet requirements of the safe operation of high voltage systems in marine/offshore applications (HV systems **not** control systems) This course is more advanced than the MAR4 course and includes a broader technical emphasis with fewer practical switching operations.

### Outline Contents

- Review of Marine/offshore statutory electrical requirements
- Philosophy of high voltage distribution
- Review of Operational and safety features of switchgear
- Operational Procedures
- Review of Marine / offshore high voltage safety rules
- Basic fault calculations
- Marine / offshore application of electrical protection
- Principles of power management systems
- Electrical testing principles & demonstration
- Treatment of system neutral point
- Synchronisation
- Electrical maintenance
- Case studies
- Automatic voltage regulation
- Practical exercises (2-switching/ safety documents)
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

20<sup>th</sup> – 24<sup>th</sup> Feb

19<sup>th</sup> – 23<sup>rd</sup> Mar

18<sup>th</sup> -22<sup>nd</sup> Jun

3<sup>rd</sup> - 7<sup>th</sup> Sep

12<sup>th</sup> – 16<sup>th</sup> Nov

## Electric Power Failure Preparation for an Emergency

How do we ensure that all important facility functions are protected from power failures, particularly on board vessels or offshore platforms? ARE YOU PREPARED FOR THE UNEXPECTED?

The Maritime and Coastguard Agency (MCA) states in the Marine Guidance Note MGN 52 (M+F) that “*Investigation into marine casualties has indicated that a number of incidents have occurred in which the emergency source of electrical power has not operated correctly following the loss of main power. The purpose of this Marine Guidance Note is to remind those responsible for the operation of ships that the Regulations require periodic testing of the complete emergency electrical system including any automatic starting arrangements*”.

It is important to regularly assess the risk of electrical power failure at various degrees of magnitude and impact severity, and make plans to deal with such an emergency. Planning and implementation of risk reduction approaches to addressing electrical power failure are vital to preparation for emergencies.

Providing competency training and testing for all operations staff and others responsible for system maintenance of the emergency power supply systems, plays a major role in minimising emergency consequences.

### How to Train for a Power Failure Emergency

The best way to prepare for loss of electrical power is to methodically consider the problems that are likely to arise and devise strategies to pro-actively eradicate those problems.

In addition to technical skills and competencies, training of non-technical skills which are crucial to the effective management of emergency situations is a vital issue, with particular focus on the human factors and how we behave in an emergency situation, including decision making, situation awareness, communication, co-ordination, teamwork and stress management.

For further details, please see **The Control & Management of Offshore & Marine High Voltage Systems Under Power Failure & Emergency Conditions (course code MAR6)**.

*continued on page 23*

continued from page 22

## **MAR 6      The Control & Management of Offshore & Marine High Voltage Systems During Power Failure & Emergency Conditions**

**Duration:**    5 days

**Introduction:** This course is designed for candidates involved in the management and operation of marine/offshore high voltage power systems requiring an understanding of the principles of power generation and high voltage distribution systems up to and including 15kV and how to safely control and manage abnormal situations such as power failures and emergencies. The course also gives candidates an awareness of the safe operation of high voltage systems.

**Participants:** Marine/offshore personnel responsible for the safe control and management of high voltage power systems.

**Aim:** To give participants an understanding of the functional, operational and safety requirements of marine and offshore high voltage systems. And the remedial action necessary during system faults.

### **Outline Contents**

- Review of Statutory electrical regulations
- Situation / stress management
- Operational and safety features of switchgear
- Review of High voltage safety rules and procedures
- An introduction to electrical protection
- Synchronisation and control of generators
- An outline of DCS and SCADA systems
- An introduction to power management systems
- The operation of power systems during planned and fault shutdowns
- Action to be taken during loss of high voltage control facilities
- Simulated and practical exercises
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

20<sup>th</sup> – 24<sup>th</sup> Feb

21<sup>st</sup> – 25<sup>th</sup> May

24<sup>th</sup> – 28<sup>th</sup> Sep

## NEW FOR 2012

### IMCA1 Stage 1 – Introduction to Marine Electrical Safety

**Duration:** 3 days

**Introduction:** This course is designed in line with I.M.C.A. (International Marine Contractors Association) syllabus and is accredited by The Faraday Centre Ltd.

**Participants:** Chief engineers, engineers, electricians, ROV and other technicians.

#### Introduction and safety:

- Electrical safety definitions and practices
- HV equipment and safety
- Electrical hazards to the human body
- Procedures to minimise risk while working on HV systems
- HV protection devices
- Precautions for live testing
  
- Practical demonstration of HV proving dead equipment
- Isolation procedures
  
- Earthing systems
- Video of short circuit testing and HV related failures
- Classification of hazardous areas
- Use of electricity in hazardous areas
- Description of components for use in hazardous areas
- Standards for working with High Voltage
- Practical exercise

#### Basic Equipment Theory:

- Generators
- DP classes 1, 2 and 3
- Bus ties – open and closed
- Variable speed drives
  
- Isochronous and droop speed control
- Line insulation monitors and current transformers
- Switchboards and equipment
  
- Switches, contactors, isolators and circuit breakers
- Motors
- Transformers
  
- Maintenance contractor and crew safety and awareness of common practices such as:
  - DC pressure testing
  - Insulation resistance
  - Low ohm testing
  - Thermography

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

14<sup>th</sup> – 16<sup>th</sup> Mar

13<sup>th</sup> – 15<sup>th</sup> Jun

31<sup>st</sup> Oct – 2<sup>nd</sup> Nov

**NEW FOR 2012**

**IMCA2 Stage 2 – Marine Power Generation & Distribution including DP**

**Duration:** 5 days

**Introduction:** This course is designed in line with I.M.C.A. (International Marine Contractors Association) syllabus and is accredited by The Faraday Centre Ltd.

**Participants:** Chief engineers, engineers, electricians, ROV and other technicians.

**Aim:** A more detailed course intended for those who are working daily with power generation and high voltages.

**Outline Contents**

- Technical differences between HV and LV equipment
  - Generation and distribution
  
  - Protection, current transformers and voltage transformers
    - Rotating diode protection in generators
  - Voltage regulation and excitation guard
  
  - Synchronising
    - Automatic, semi-automatic and manual control
  - Frequency regulation – governors and control
  
  - Power management systems – load sharing, load shedding, blocking, limiting, auto-starting
  - Paralleling transformers
  - Protection systems philosophy for both open and closed bus tie scenarios
  - DP classes 1, 2 and 3, and their electrical implications
  - Governors and automatic voltage regulators
  
  - Generator limitation
- Power factor and total harmonic distortion
  - Types of HV and LV earthing in vessels
    - Importance of remedying earth faults
  - Correct use of switching and operational mimic
  
  - Reactive power
    - Relationship between power, reactive power and apparent power
  - Essential and non-essential load
  
  - Fault finding – relay interpretation, manual operation of circuit breakers, manual restart after blackout
  - DP incidents involving electrical failures
  
  - Blackout and recovery
  - HV switchgear – starter types
  
  - How to develop safe working instructions, isolation/securing
  - Standards for working with HV
    - IEC standards
    - local standards and recommended practices
  - Risk, injury and emergency treatment
    - Procedures for minimising risk when working with HV equipment
  - Practical exercise

.... *Continued IMCA2*

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

19<sup>th</sup> – 23<sup>rd</sup> Mar

18<sup>th</sup> – 22<sup>nd</sup> Jun

5<sup>th</sup> – 9<sup>th</sup> Nov

**NEW FOR 2012**

**IMCA3 Stage 3 – Audit/Assessor Training for Marine/Offshore Electricians & Engineers**

**Duration:** 2 days

**Introduction:** This course is designed in line with I.M.C.A. (International Marine Contractors Association) syllabus and is accredited by The Faraday Centre Ltd.

**Participants:** Electrically competent persons.

**Aim:** A ‘third level’ course intended to train electrically competent persons in audit and investigation techniques, particularly with reference to electrical incidents or occurrences.

**Outline Contents**

- Training the trainer
- Assessing/audit techniques
- Presentation skills
- Pre-engineering
- Risk assessments
- Rules and regulations

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

26<sup>th</sup> – 27<sup>th</sup> Mar

25<sup>th</sup> – 26<sup>th</sup> Jun

12<sup>th</sup> – 13<sup>th</sup> Nov

## **M1 Principles applied to the Maintenance of Electrical Switchgear**

**Duration:** 5 days

**Introduction:** This course is intended to provide theoretical and practical instruction on the maintenance and repair of HV/LV switchgear of various types, up to and including 15kV.

**Participants:** Engineers, supervisors and technicians with a responsibility for the maintenance of HV/LV electrical switchgear

**Aim:** To provide candidates with an understanding of the functional and operational requirements of HV/LV electrical switchgear

### **Outline Contents**

- Statutory regulations and codes of practice
- Operational and safety features of switchgear
- Primary conductors
- Maintenance of Circuit breakers – oil/gas/air/vacuum
- Auxiliary equipment
- Exterior of switchpanels
- Switchroom housekeeping
- Battery units
- Trouble shooting
- Practical maintenance exercises
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

13<sup>th</sup> – 17<sup>th</sup> Feb

11<sup>th</sup> – 15<sup>th</sup> Jun

30<sup>th</sup> Jul – 3<sup>rd</sup> Aug

17<sup>th</sup> – 21<sup>st</sup> Sep

## Section 2: Electrical Protection Courses

### P1 Protection of Electrical Power Systems

**Duration:** 5 days

**Introduction:** This training programme requires a good foundation of electrical knowledge. The course covers industrial electrical protection in depth and involves a number of practical exercises and demonstrations combined with classroom theory. A wide range of protective devices are used during the course including mechanical, electromechanical and microprocessor based relays.

**Participants:** Electrical/plant engineers, supervisors, technicians, electricians with responsibility for the application, commissioning and/or maintenance of electrical protective equipment used on industrial electrical power systems

**Aim:** To provide detailed theoretical and practical instruction on HV/LV electrical protective equipment including primary and secondary injection of electronic and electro mechanical devices.

#### Outline Contents

- The role of protection
- Current and voltage transformers
- Fuses and other protective devices
- Methods of achieving discrimination
- Fault calculation
- The calculation of graded time settings for IDMTL relays
- Testing procedures
- Motor, feeder, transformer, generator and bus zone protection
- Standard marking of switchgear panel wiring
- Tutorials
- Case studies
- Practical exercises: CT magnetisation tests, primary/secondary injection, bench testing
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate, candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

27<sup>th</sup> Feb – 2<sup>nd</sup> Mar

23<sup>rd</sup> – 27<sup>th</sup> Apr

21<sup>st</sup> – 25<sup>th</sup> May

25<sup>th</sup> - 29<sup>th</sup> June

20<sup>th</sup> – 24<sup>th</sup> Aug

22<sup>nd</sup> – 26<sup>th</sup> Oct

## **P2                    Appreciation of the Protection of Electrical Power Systems**

**Duration:**     2 days

**Introduction:** This course is intended to give personnel an overview of protective apparatus.

**Participants:** Electrical/plant engineers, supervisors, technicians, electricians requiring an outline knowledge of the application of electrical protective equipment utilised on electrical power systems.

**Aim:** To provide an outline of theoretical and practical instruction on HV/LV electrical protective equipment, giving candidates an appreciation of the role and application of various protective devices.

### **Outline Contents**

- The role of protection
- Fuses and other protective devices
- Current and voltage transformers
- Methods of achieving discrimination
- Relay grading
- An appreciation of Motor, Feeder ,Transformer ,Generator and Bus zone Protection.
- Trip circuit supervision requirements
- Tutorial / practical
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate. Candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

8<sup>th</sup> – 9<sup>th</sup> Feb

29<sup>th</sup> – 30<sup>th</sup> Mar

3<sup>rd</sup> - 4<sup>th</sup> May

28<sup>th</sup> -29<sup>th</sup> Aug

22<sup>nd</sup> – 23<sup>rd</sup> Nov

## WT4 Fundamentals of Operational Procedures and Practices Relating to the Safe Electrical Operation of Wind Turbines

**Duration:** 5 days

**Introduction:** This course is designed to provide personnel within the renewable energy industry, with the knowledge of safe working procedures and best practices, to enable them to carry out their duties in a safe and competent manner. This course is a renewable energy development from our S4 course.

**Participants:** Engineers, Supervisors and Technicians with a responsibility for the operation and maintenance of on/offshore wind turbines. Candidates with limited electrical experience may find it beneficial to attend our S9 course, which serves as a pre-cursor to this course.

**Aim:** To provide theoretical and practical instruction relating to the safe operation and maintenance of on/offshore wind turbines. Also enables candidates to perform HV/LV switching operations and to prepare them for full authorisation in accordance with their companies' safety rules and procedures.

### Outline Content:

- Electrical Hazards and Precautions
- PPE requirements
- Electricity at Work Regulations 1989
- History of Wind Power Utilisation
- Wind Turbine Power Generation
- Switchgear basics and general principles
- Operational and safety features of switchgear
- Electrical Safety Documents
- Key safes and multihaps
- Operational Procedures
- Practical Switching Exercises
- Issue and Control of Safety Documentation
- An introduction to partial discharge detection
- Wind Turbine High Voltage Safety Rules
- Wind Turbine Switchgear Safety
- The role of protection relays

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate. Candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

5 <sup>th</sup> – 9 <sup>th</sup> Mar	14 <sup>th</sup> – 18 <sup>th</sup> May	25 <sup>th</sup> – 29 <sup>th</sup> Jun	30 <sup>th</sup> Jul – 3 <sup>rd</sup> Aug
10 <sup>th</sup> – 14 <sup>th</sup> Sep	8 <sup>th</sup> – 12 <sup>th</sup> Oct	5 <sup>th</sup> – 9 <sup>th</sup> Nov	

## GEN

## Appreciation of Generator Principles & Protection

**Duration:** 2 Days

**Introduction:** This two day course covers the generation of electricity from first principles. Starting with Fleming’s Right Hand Rule and progressing to through to modern brushless generators. The course will also include the operation of generators, synchronising and protection of generators. This is a classroom based course with no practical content except for the use of simulators.

**Participants:** Electrical engineers / technicians responsible for the operation and maintenance of electrical generators.

**Aims:** To provide deeper technical information on the varying range of plant generation, the safe operation and protection of generators in an electrical power system.

### Outline Content:

- Generator operating principles
- The generation of electricity
- Fleming’s Right Hand Rule
- Simple single phase generators
- Three phase generators
- Cylinder rotor
- Salient pole rotor
- Brushless excitation
- Configuration of Brushless Alternator
- Schematic Diagram
- Function of AVR’s
- Three term controllers
- Droop
- Voltage speed and phase
- Three lamp method & synchronisation
- Multiple pole machines
- Synchroscope
- Permissive relays
- Automatic systems
- Generator protection
- G59 Relays
- Diode failures
- Field failure
- Embedded generation
- Reverse speed
- Overspeed
- Rate of frequency change
- Over voltage
- Thyristor control
- Variable speed drives
- Inverters

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate. Candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre:

6<sup>th</sup> – 7<sup>th</sup> Feb

3<sup>rd</sup> – 4<sup>th</sup> April

15<sup>th</sup> - 16<sup>th</sup> May

6<sup>th</sup> – 7<sup>th</sup> Jun

## ARC Arc Flash Appreciation Training

**Duration:** 1 Day

**Introduction:** Many employers are now implementing Arc Flash PPE for electrical personnel even though there is no European standard. This one day course covers the arc flash risk assessment described in IEEE 1584. As well as examples of incident energy and Flash Protection Boundary calculations. Methods used to calculate fault energy at points on the systems are also examined.

**Participants:** Electrical engineers / technicians responsible for the operation and maintenance of electrical systems.

**Aims:** To provide information and examples that will assist participants in their understanding of the implications of Arc Flash accidents and the steps to be taken to control risk. This study will include the parameters used in the calculations and how they are obtained.

### Outline contents:

- Effects of Arc Flash accidents
- Duration of Arc
- Fault energy
- Arc fault current
- Fault level
- System model
- Risk Assessment
- Voltages and equipment classes
- Load flow
- Working distance
- Bolted fault current
- Determine incident energy
- Determine flash protection boundary

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate. Candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre:

23<sup>rd</sup> Jan

2<sup>nd</sup> Apr

14<sup>th</sup> May

31<sup>st</sup> Aug

## Section 3: Testing Courses

### T1 Electrical Pressure Testing (Dielectric strength testing)

**Duration:** 1 day

**Introduction:** This course covers the theoretical and practical principles of pressure testing on HV distribution systems up to and including 15kV, including the different insulating material characteristics as well as the methods used to enable the pressure testing of high voltage equipment, including cables, switchgear, transformers and motors with emphasis placed upon safety requirements and interpretation of test results.

**Participants:** Electrical engineers/technicians responsible for carrying out high voltage pressure testing or those with a responsibility for supervising personnel who carry out high voltage pressure tests. It is recommended that candidates should be authorised to receive sanction for test documents before taking this course (See S8 Course).

**Aim:** To cover the theoretical and practical aspects of electrically testing the insulation integrity of power cables, switchgear, transformers, motors etc

#### Outline Contents

- Safety requirement
- Power cables
- Insulation resistance
- Polarisation index
- Flash testing
- DC pressure tests
- AC pressure tests
- VLF (Very Low Frequency) tests
- Practical testing exercises
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate. Candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

30<sup>th</sup> Jan

26<sup>th</sup> Mar

28<sup>th</sup> May

23<sup>rd</sup> Jul

1<sup>st</sup> Oct

## T2 Earth Electrode Testing

**Duration:** 1 day

**Introduction:** This course outlines different types of earth electrode systems used in conjunction with high voltage networks including methods of testing earth electrode systems and subsequent interpretation of test results. (Note, this is not a design course)

**Participants:** Electrical engineers/technicians/contractors responsible for the installation, commissioning and testing of earth electrodes used on High Voltage systems.

**Aim:** To provide theoretical and practical instruction in the testing of earth electrode systems.

### Outline Contents

- Purpose of test
- Testing conditions
- Test equipment
- Safety considerations
- Statutory regulations and standards
- Test results
- Remedial work
- Testing procedures
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate. Candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

31<sup>st</sup> Jan

27<sup>th</sup> Mar

29<sup>th</sup> May

24<sup>th</sup> Jul

2<sup>nd</sup> Oct

### T3 Transformer Testing and Maintenance

**Duration:** 2 days

**Introduction:** This course provides technical information about the significance of various site tests that are carried out on High Voltage transformers. It also covers practical methods of transformer testing including practical routine tests for post fault and preventive maintenance.

**Participants:** Electrical engineers/technicians responsible for the installation, site commissioning, operation and maintenance of electrical power transformers.

**Aim:** To provide understanding in the practical, technical and safety aspects of on site transformer operation, maintenance and testing.

#### Outline Contents

- Safety requirements
- Transformer design and construction
- Periodic and post installation testing
- Transformer oil
- Buchholz protection unit
- Open circuit tests
- Short circuit tests
- Vector group tests
- Temperature devices
- Insulation testing
- Routine maintenance
- Pressure relief devices (Qualitrol)
- Practical exercises
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate. Candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

1<sup>st</sup> – 2<sup>nd</sup> Feb

28<sup>th</sup> – 29<sup>th</sup> Mar

30<sup>th</sup> – 31<sup>st</sup> May

25<sup>th</sup> – 26<sup>th</sup> Jul

3<sup>rd</sup> – 4<sup>th</sup> Oct

## T5 Cable Identification / Spiking

**Duration:** 1 day

**Introduction:** This course is designed for electrical personnel responsible for identification/spiking and proving dead of HV electrical power cables.

Note: This is **not** a cable fault location course.

**Participants:** Electrical engineers/technicians responsible for ensuring the safety of personnel working on HV underground electrical power cables.

**Aim:** To provide instruction in the practical, technical and safety aspects of identifying electrical power cables and their subsequent spiking to ensure the safety of personnel required to work upon these cables

### Outline Contents

- Safety requirements
- Ground clearance
- Methods of cable identification
- Cable spiking (use and maintenance)
- Electrostatic/Electromagnetic fields
- Case studies
- Practical exercises
- Course review

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate. Candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

3<sup>rd</sup> Feb

30<sup>th</sup> Mar

1<sup>st</sup> Jun

27<sup>th</sup> Jul

5<sup>th</sup> Oct

## Section 4: Low Voltage Courses

This section is predominantly LV however some courses are applicable to HV also.

### A1 Electricity at Work Regulations 1989

**Duration:** 1 day

**Introduction:** This course explains the requirements and the implications of the Electricity at Work Regulations 1989 for those responsible for electrical safety at work. The duties and responsibilities of everyone affected by the legislation are clearly outlined.

**Participants:** Personnel with a functional and/or managerial responsibility for the safe use of electricity and electrical equipment.

**Aim:** To provide delegates with an understanding of the Electricity at Work Regulations 1989 and the application of the regulations throughout industry, commercial premises, shops, offices, schools, hospitals etc. operating at various voltage levels on both high and low voltage systems.

#### Outline Contents

- Hazards & Effects of Electricity.
- The Purpose & Back ground of the Regulations.
- Scope of the Regulations.
- Employers, Employees & Contractors Responsibilities.
- Review of Regulations.
- Legal Implications of non Compliance.
- Case Studies.
- Course Review.

**Certification:** Candidates who successfully complete the theoretical competence assessment will receive a Faraday “Competence” certificate. Those who fail or do not wish to undertake the competence assessment will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

21 <sup>st</sup> Feb	16 <sup>th</sup> Mar	13 <sup>th</sup> & 26 <sup>th</sup> Apr	6 <sup>th</sup> Jun	23 <sup>rd</sup> Aug
6 <sup>th</sup> Sep	22 <sup>nd</sup> Nov	13 <sup>th</sup> Dec		

## L1 Live Testing on Systems up to 1000 Volts AC

**Duration:** 3 days

**Introduction:** This course is designed to provide best practices for safe working methods for those who need to perform live testing on various electrical equipment & systems. Instruction will be provided to personnel regarding the need and justification for performing tasks or faultfinding on or near live LV conductors, in accordance with statutory regulations.

**Participants:** Electrical engineers, electrical technicians, electricians and multi-skilled technicians required to carry out fault finding on or near live LV conductors.

**Aim:** To identify potential hazards, determine safe working procedures, carry out fault finding and avoid danger from such work. The course is not designed to cover any live work for maintenance, repair or modification purposes.

### Outline Contents

- Hazards & Effects of Electricity.
- Safe Electrical Isolations.
- Electricity at Work Regulations 1989.
- The Necessity for Live Testing.
- Fault Energy.
- Safe use of Electrical Test Equipment.
- Risk Assessments.
- Fixed Wiring Colour Change.
- Case Studies.
- Construction Installation & Maintenance of Electrical Equipment.
- Practical Exercises.
- Course Review.

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate. Candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

12<sup>th</sup> – 14<sup>th</sup> Mar

8<sup>th</sup> – 10<sup>th</sup> May

20<sup>th</sup> – 22<sup>nd</sup> Aug

8<sup>th</sup> – 10<sup>th</sup> Oct

## L2 Live Testing on AC & DC Systems up to 1000V AC / 1500V DC

**Duration:** 3 days

**Introduction:** This course is designed to provide best practices for safe working methods for those who need to perform live testing on various electrical equipment & systems. Instruction will be provided to personnel regarding the need and justification for performing tasks or faultfinding on or near live LV conductors, in accordance with statutory regulations. Due to the inclusion of DC modules there will be less exposure to AC equipment, which is covered in more detail within the L1 course.

**Participants:** Electrical engineers, electrical technicians, electricians and multi-skilled personnel required to carry out fault finding on or near live LV conductors.

**Aim:** To identify potential hazards, determine safe working procedures and carry out fault finding so as to avoid danger whilst undertaking the work. The course is not designed to cover any live work for maintenance, repair or modification purposes.

### Outline Contents

- Hazards & Effects of AC & DC Power.
- Safe Electrical Isolations.
- Electricity at Work Regulations 1989.
- DC Power Sources.
- Safe Handling & Maintenance of Batteries.
- Statutory Regulations.
- The Necessity for Live Testing.
- Fault Energy.
- Safe use of Electrical Test Equipment.
- Risk Assessments.
- Fixed Wiring Colour Change.
- Case Studies.
- Construction, Installation & Maintenance of Electrical Equipment.
- Practical Exercises.
- Course Review.

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate. Candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

13<sup>th</sup> – 15<sup>th</sup> Feb

2<sup>nd</sup> – 4<sup>th</sup> Jul

13<sup>th</sup> – 15<sup>th</sup> Aug

26<sup>th</sup> – 28<sup>th</sup> Nov

**S11 Low Voltage Authorised Person Training  
(Formerly known as The Safe Operation of Low Voltage High Power Systems)**

**Duration:** 5 days

**Introduction:** This is an advanced training course aimed at experienced electricians/engineers who are required to carry out switching operations for the safe isolation and de-isolation of low voltage power systems up to 1000 volts AC. Candidates will be introduced to safe operating procedures including lockout/tagout, risk assessment and the issue and control of safety documentation. The course includes several practical sessions on a wide range of industrial power installations as well as the preparation of Task Risk Assessments.

**Participants:** This course is intended for personnel involved with the operation of low voltage installations (up to 1000 volts AC) for the purpose of commissioning, testing, inspection, maintenance or repair.

**Aim:** This course is intended to enhance candidate’s knowledge of statutory regulations, codes of practice, safety procedures and technical aspects of low voltage power systems.

**Outline Contents**

- Electricity at Work Regulations
- Electrical hazards and precautions
- Outline of the design, construction, installation and maintenance of low voltage equipment
- Appreciation of earthing systems, power equipment and safety earths
- Outline of HV and LV installations (including incoming transformers)
- Electrical isolation and safety procedures
- Safety documentation (switching programme – lockout/tagout)
- Electrical permit to work
- Safe testing of low voltage electrical equipment and installations
- Risk assessment
- Application of low voltage protection
- Case studies
- Practical exercises

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday “Competence” certificate. Candidates who fail or do not wish to undertake the competence assessments will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

16 <sup>th</sup> – 20 <sup>th</sup> Jan	16 <sup>th</sup> - 20 <sup>th</sup> Apr	21 <sup>st</sup> - 25 <sup>th</sup> May	11 <sup>th</sup> – 15 <sup>th</sup> Jun
6 <sup>th</sup> – 10 <sup>th</sup> Aug	29 <sup>th</sup> Oct – 2 <sup>nd</sup> Nov		

**C&G  
2377-001**

**Management of Electrical Equipment Maintenance  
(Portable Appliance Testing, City & Guilds 2377-001)**

**Duration:** 1 day including City & Guilds examination

**Introduction:** The C&G2377-001 is the first unit to City & Guilds 2377 Portable Appliance Testing qualification. The course addresses the setting up and management of the systems involved for the in-service inspection and testing of electrical equipment. The unit is aimed at those who will manage and administer the system.

**Participants:** Electrical and non-electrical personnel with a responsibility for the safe use of electrical equipment (portable appliances).

**Aim:** To provide information and familiarise candidates with the management of electrical equipment maintenance based on the IEE Code of Practice for in-service inspection and testing of electrical equipment.

**Outline Contents**

- Management systems
- The Law and scope of the legislation
- Electrical equipment classification
- In-service inspection and testing
- Documentation and labelling
- Training for competence
- Instruments
- City and Guilds 2377-001 examination.

**Examination:** The online multiple choice examination comprises 45 questions (open book, 1.5 hour) and must be booked in advance either at the time of course booking or at least 7 days prior to course commencement.

**Certification:** Candidates who successfully complete the course and City & Guilds examination will receive a City & Guilds certificate in addition to a Faraday “Attendance” certificate. Those who fail the examination will receive a Faraday “Attendance” certificate only.

**Dates:** For courses undertaken at our UK training centre

24<sup>th</sup> Apr

7<sup>th</sup> Jun

**C&G  
2377-002**

**Inspection & Testing of Electrical Equipment (Portable Appliances Testing) City & Guilds 2377 –002**

**Duration:** 1 day including City & Guilds examination

**Introduction:** The C&G2377-002 is the second unit to City & Guilds 2377 Portable Appliance Testing qualification. During the course, a number of practical exercises are undertaken using a range of portable appliance testing equipment. This course is aimed at individuals responsible for the undertaking of practical inspection and testing of electrical equipment.

**Participants:** Electrical and non-electrical personnel with a responsibility for the safe use of electrical equipment (portable appliances).

**Aim:** To give delegates theoretical and practical experience in the implementation of a formal inspection and testing regime for electrical equipment (portable appliances)

**Outline Contents**

- Hazards of electricity
- Classification of appliances
- Dangers associated with the use of various types of portable & fixed electrical appliances.
- Legal requirements and IEE Code of Practice
- Approved inspection and testing procedures
- Portable appliance testers
- Recording of results and maintenance documents
- Practical exercises and Course review
- City and Guilds 2377-002 examination.

**Examination:** The online multiple choice examination comprises 30 questions (open book, 1 hour) and must be booked in advance either at the time of course booking or at least 7 days prior to course commencement.

**Certification:** Candidates who successfully complete the course and City & Guilds examination will receive a City & Guilds certificate in addition to a Faraday “Attendance” certificate. Those who fail the examination will receive a Faraday “Attendance” certificate only.

**Dates:** For courses undertaken at our UK training centre

19<sup>th</sup> Jan

25<sup>th</sup> Apr

8<sup>th</sup> Jun

16<sup>th</sup> Aug

1<sup>st</sup> Nov

**C&G2382-10 Certificate in the Requirements of Electrical Installations  
BS7671:2008: (IEE 17<sup>th</sup> Edition Wiring Regulations)**

**Duration:** 3 days including City & Guilds examination

**Introduction:** The C&G2382-10 course is designed around the required syllabus for the City & Guilds 2382-10 exam and qualification. It is an industry standard qualification for the electrical trade. This course is aimed at covering all of the alterations with the new BS 7671 (2008) Regulations for Electrical Installations.

It is a requirement of the course that candidates provide their own copy of the BS7671 (2008) IEE 17<sup>th</sup> Edition Wiring Regulations and IEE On-site Guide.

**Participants:** All electrical personnel with a responsibility for the safe installation of electrical apparatus operating up to 1000 volts AC in industrial/commercial & domestic premises.

**Aim:** To familiarise participants with the layout, content and application of the 17<sup>th</sup> Edition Wiring regulations

**Outline Contents**

- Background to BS7671 (2008).
- Legal status and association with statutory documents
- Layout and numbering system
- Scope, object and fundamental requirements for safety
- Assessment of general characteristics
- Protection for safety
- Selection and erection of equipment
- Special installation or locations
- Inspection and testing
- Course review
- City and Guilds 2382-10 examination.

**Examination:** The online multiple choice examination comprises 60 questions (2 hours) and this must be booked in advance either at the time of course booking or at least 7 days prior to course commencement.

**Certification:** Candidates who successfully complete the course and City & Guilds examination will receive a City & Guilds certificate in addition to a Faraday “Attendance” certificate. Those who fail the examination will receive a Faraday “Attendance” certificate only.

**Dates:** For courses undertaken at our UK training centre

16 <sup>th</sup> – 18 <sup>th</sup> Jan	27 <sup>th</sup> – 29 <sup>th</sup> Feb	10 <sup>th</sup> – 12 <sup>th</sup> Apr	8 <sup>th</sup> – 10 <sup>th</sup> May	18 <sup>th</sup> – 20 <sup>th</sup> Jun
16 <sup>th</sup> – 18 <sup>th</sup> Jul	10 <sup>th</sup> – 12 <sup>th</sup> Sep	15 <sup>th</sup> – 17 <sup>th</sup> Oct	12 <sup>th</sup> – 14 <sup>th</sup> Nov	

**C&G2382-20 Certificate in the Requirements of Electrical Installations BS7671:2008: (IEE 17<sup>th</sup> Edition Wiring Regulations).**

**Duration:** 1 day including City & Guilds examination

**Introduction:** This course is the update qualification to the IEE 17<sup>th</sup> Edition for those personnel who already have IEE 16<sup>th</sup> Edition qualification, known as City & Guilds 2381. The course covers topics such as protection for safety, selection and erection of equipment, and inspection and testing to meet the standards of the IEE Wiring Regulations BS7671: June 2008.

It is a requirement of the course that candidates provide their own copy of the BS7671 (2008) IEE 17<sup>th</sup> Edition Wiring Regulations and IEE On-site Guide.

**Participants:** All electrical personnel with a responsibility for the safe installation of electrical apparatus operating up to 1000 volts in industrial / commercial and domestic premises.

**Entry Requirements:** It is required that candidates must have achieved one or more of the following qualifications:

- City & Guilds 2381, IEE 16<sup>th</sup> Edition (June 2001 or later)
- City & Guilds 2330 Part 07
- City & Guilds 2330 Part 08
- City & Guilds 23601 Part 2 (certified from 1<sup>st</sup> January 2004 onwards)

Proof of certification will be required at the time of booking the course and photographic identification at the time of undertaking the course and examination.

**Aim:** To familiarise participants with the layout, content and application of the recent changes to BS 7671 (2001) the wiring regulations.

**Outline Contents**

- Background to the changes within BS7671 (2008).
- Legal status and association with statutory documents
- Layout and numbering system
- Scope, object and fundamental requirements for safety
- Assessment of general characteristics
- Protection for safety; Selection and erection of equipment
- Special installation or locations
- Inspection and testing
- Course review
- City and Guilds 2382-20 examination.

**Examination:** The online multiple choice examination comprises 30 questions (1 hour) this must be booked in advance at the time of course booking.

**Certification:** Candidates who successfully complete the course and City & Guilds examination will receive a City & Guilds certificate in addition to a Faraday “Attendance” certificate. Those who fail the examination will receive a Faraday “Attendance” certificate only.

**Dates:** For courses undertaken at our UK training centre

6 <sup>th</sup> Feb	5 <sup>th</sup> Mar	2 <sup>nd</sup> Apr	21 <sup>st</sup> Jun
18 <sup>th</sup> Oct	15 <sup>th</sup> Nov		

**C&G AM1**

**Requirements for Electrical Installations BS7671:2008  
17<sup>th</sup> Edition Wiring Regulations – Amendment 1:2011**

**Duration:** 1 day including Faraday Centre multiple choice assessment.

**Introduction:** This course is to provide candidates with knowledge of the recent changes to BS7671:2008 published as Amendment 1:2011.

**Participants:** All electrical personnel with a responsibility for the safe installation, inspection and testing of electrical wiring and equipment up to 1000V AC / 1500V DC.

**Entry Requirements:** All candidates must already hold City & Guilds 2382-10, 2382-20 or an equivalent qualification.

*Candidates must provide their own copy of BS7671:2008 Amendment 1 (Green cover).*

**Aim:** To provide candidates with knowledge of the additions and alterations to BS7671:2008, published 2011.

**Outline Contents:**

- Background to the changes
- New definitions
- New Regulations
- Revised Regulations
- New reference tables
- Revised calculations/formulae
- New Special Locations
- Items to be moved or deleted

**Examination:** Each candidate will sit a 30 question multiple choice paper exam (open book) devised by The Faraday Centre.

**Certification:** Candidates who successfully complete the course and exam will receive a Faraday Centre Attendance Certificate

Dates: For courses undertaken at our UK training centre:

20 <sup>th</sup> Jan	17 <sup>th</sup> Feb	23 <sup>rd</sup> Mar	20 <sup>th</sup> Apr	18 <sup>th</sup> May
22 <sup>nd</sup> June	13 <sup>th</sup> July	17 <sup>th</sup> Aug	14 <sup>th</sup> Sep	12 <sup>th</sup> Oct
16 <sup>th</sup> Nov	7 <sup>th</sup> Dec			

## **Accredited Electrical Inspectors Fairground/Amusement Devices**

About A.D.I.P.S.

ADIPS (Amusement Device Inspection Procedures Scheme) is the fairground and amusement park industry's self regulated safety inspection scheme which registers competent ride inspectors and the rides they inspect.

Qualified and competent groups or individuals can register with the scheme to be able to inspect amusement devices in various engineering disciplines, for pre use inspection and in-service annual inspection, on behalf of the members of the industry trade associations.

The purpose of the scheme is to promote and improve fairground and amusement park safety through rules and procedures relating to the annual inspection of the amusement devices. It is supported by industry associations who require that their members use ADIPS.

These industry associations make up the policy setting body for the procedures scheme which is the Amusement Device Safety Council (ADSC).

ADIPS is also available to any operator of amusement devices as it demonstrates "BEST PRACTICE" and their compliance with the Health and Safety at Work (etc) Act."

For additional information about ADIPS, please visit [www.adips.co.uk](http://www.adips.co.uk)

The Faraday Centre Ltd have developed a course exclusively for ADIPS electrical inspectors conducting electrical inspection and testing on amusement devices. The training programme takes into account the increased health and safety standards required for electrical inspectors which is indicative of the importance of health and safety within the amusement industry.

The Faraday Centre Ltd is the exclusive training provider of this course to ADIPS. For further details, please refer to page 48 or contact:

The Faraday Centre, telephone 01642 467236

ADIPS, telephone 0191 516 6381

*continued on page 48*

continued from page 47

## **ADIPS Amusement Device Inspection Procedures Scheme (A.D.I.P.S.) Inspector Training and Assessment**

**Duration:** 3 days

**Introduction:** This course is designed specifically to ascertain the suitability of electrical personnel responsible for the electrical inspection and testing of amusement devices, associated with fairgrounds, amusement parks, and theme parks.

**Participants:** Electrical personnel who are to be responsible for the inspection and testing of amusement devices associated with fairgrounds, arcades etc. Participants **must** possess City & Guilds 2382 and 2391 qualifications and be able to provide proof of certification along with photographic identification.

**Aim:** To provide participants with theoretical and practical experience of the electrical inspection and testing of amusement devices and to identify their competence and suitability to become ADIPS inspectors.

### **Outline Contents**

- Legal aspects – Electricity at work regulations 1989
- Electrical hazards and precautions
- Protective devices
- Fixed and mobile installations
- Fault Levels
- DC Ripple – Generation/Rectification
- Safety requirements for inspection and testing
- Introduction to ADIPS test forms
- Cable sizing
- Connections/Plug sockets/Cable types/enclosures and terminations
- Practical Exercises.
- Course Review.

**Certification:** Candidates who successfully complete the theoretical and practical competence assessments will receive a Faraday Competence certificate. NB: Successful completion of the course and competence assessments will enable participants to register with ADIPS as an inspector.

**Dates:** For courses undertaken at our UK training centre

23<sup>rd</sup> – 25<sup>th</sup> Jan

1<sup>st</sup> – 3<sup>rd</sup> May

17<sup>th</sup> – 19<sup>th</sup> Sep

## HAZ 1 Safe Use of Electrical Equipment in Hazardous Areas

**Duration:** 3 days

**Introduction:** This course is designed for personnel working within hazardous area environments. The course provides a theoretical overview of the hazards associated with installing, operating and maintaining electrical equipment within potentially explosive areas. This is not a COMPEX course however the same theories, details and standards are covered.

**Participants:** All personnel in any position within a company working on a plant / installation or within any environment which contains hazardous gases / vapours / dusts that are potentially explosive. This particularly applies to personnel involved with operating or working with any electrical plant / equipment or machinery in the oil & gas industry.

**Aim:** To provide personnel working within potentially explosive environments with sufficient knowledge, and detail to ensure that they perform any task relating to the installation, operation & maintenance of electrical equipment safety.

### Outline Contents

- Definitions of Hazardous Areas
- Protection Concepts
- Hazardous Area Classification
- Gas Groups
- Flash Point
- Ignition Temperatures
- Explosive Limits LEL / UEL
- Zone Definitions 0 1 & 2 Safe Areas
- Temperature Classification
- Equipment Selection
- Labelling & Certification to CENELEC Standards
- ATEX Directives
- Duties of the installer, Manufacturer & Operator
- Inspections & Maintenance of Electrical Equipment
- Intrinsically Safe (IS) Equipment & Systems

**Certification:** Candidates who successfully complete the theoretical competence assessment will receive a Faraday “Competence” certificate. Those who fail or do not wish to undertake the competence assessment will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

30<sup>th</sup> Jan – 1<sup>st</sup> Feb

19<sup>th</sup> – 21<sup>st</sup> Mar

9<sup>th</sup> – 11<sup>th</sup> Jul

28<sup>th</sup> – 30<sup>th</sup> Aug

22<sup>nd</sup> – 24<sup>th</sup> Oct

19<sup>th</sup> – 21<sup>st</sup> Nov

## E2 Electrical Safety Awareness

**Duration:** 3 days

**Introduction:** This course is designed to provide guidance on working safely on low voltage electrical equipment & systems (up to 1000V AC 1500V DC) located within industrial environments. The course will assist employees and companies to reduce the risk of personal injury, due to electrocution and arc flash, also to help prevent damage to assets due to operator error.

**Participants:** Electrical and non electrical personnel requiring electrical safety awareness training to enable them to become aware of the hazards associated with the installation, maintenance and operation of Low Voltage electrical equipment.

**Aim:** To raise the level of safety awareness for all personnel working with electrical equipment and for the candidates to comprehend the safety rules, regulations & guidelines related to current legislation.

- Hazards & Effects of Electricity.
- Arc Flash.
- Selection & Use of Suitable PPE.
- Electricity at Work Regulations 1989.
- Permit to Work (PTW).
- Electrical Documentation.
- Safe Electrical Isolations.
- Risk Assessments.
- Harmonised Cable Conductor Colours & Markings.
- Earthing & Bonding.
- Portable Appliances.
- Fault Levels & Fault Energy.
- Electrical Equipment in Hazardous Areas.
- Maintenance of Electrical Equipment.
- Safe Use of Test Equipment.
- Course Review.

**Certification:** Candidates who successfully complete the theoretical competence assessment will receive a Faraday “Competence” certificate. Those who fail or do not wish to undertake the competence assessment will receive a Faraday “Attendance” certificate.

**Dates:** For courses undertaken at our UK training centre

10<sup>th</sup> – 12<sup>th</sup> Apr

11<sup>th</sup> – 13<sup>th</sup> Jun

30<sup>th</sup> Jul – 1<sup>st</sup> Aug

24<sup>th</sup> – 26<sup>th</sup> Sep

5<sup>th</sup> – 7<sup>th</sup> Nov

**Drilling Rig Drives (SCR) Course.  
Ross Hill / Hill Graham**

# SCR Training

## Ross Hill/Hill Graham

SCR drives are used to control large DC motors used for the primary drilling functions on over 90% of all existing drilling rigs, both on and offshore.

The Ross Hill system of control encompasses rig power generation too. By controlling the generators and their engines Ross Hill pioneered a new generation of rig drive system that had considerably more immunity to blackouts (a plague of earlier, less sophisticated systems). For this reason the Ross Hill system is known by its users as a Roll Royce of a system. The Ross Hill system is the most copied of all systems, a classic example of flattery by imitation!

This course is designed for electricians and technicians working in the oil drilling industry and is principally aimed at staff employed on rigs with the Ross Hill control system, working with diesel-powered generators and SCR motor drives. The course covers the basic principles of generator AVR function, electronic engine speed control and SCR motor drive systems. The course goes on to cover the main components of the Ross Hill / Hill Graham control system. Faultfinding exercises are carried out on one of the best drive simulators in Europe.

The course is delivered by our associates, SPARCO TRAINING, at the Faraday Regional Centre in Limassol, Cyprus. Over the last several years the course has attracted interest from various international drilling companies and demand is on the increase.

**Please see page 48 for course details. Should you require additional information, please contact The Faraday Centre or directly contact SPARCO Training at [sparco@globalnet.co.uk](mailto:sparco@globalnet.co.uk)**

**SCR            Drilling Rig Drives (SCR - Ross Hill / Hill Graham)**

**Duration:**     5 days

**Introduction:** This course is equipment-specific to drilling rig SCR drive control systems manufactured by Ross Hill in the US or Hill Graham in the UK. It is designed for the electrician who is required to maintain this equipment and repair faults quickly and safely.

**Participants:** Participants should be qualified electricians or technicians with experience gained in the oilfield drilling industry. Knowledge of analogue electronics is useful but not essential.

**Aim:** To enable rig electricians to maintain and service a drilling rig drive system safely and with the minimum of down time. A secondary aim is to provide exposure to using test equipment and faultfinding in a stress-free and safe environment, reinforcing some of the lessons that cannot always be learned in the field.

**Outline Contents**

- Revision - SCRs and rectifiers, firing circuits, op-amps and use of oscilloscope
- System overview - typical systems, function, interlocks
- AC Module - Engine controls, speed control, voltage control, module testing
- DC Module - SCR firing, motor speed sensing, torque limiting, module testing
- Main Panel - switchgear, synchronising, panel schematics, isolation procedures
- Field Equipment - motors, distribution systems, driller's console
- Maintenance - routine servicing, inspection, faultfinding

**Certification:** The practical work of participants is assessed informally as the course proceeds. There is also an end of course knowledge based test. Participants who meet the required standard are awarded a certificate. The Sparco Training Certificate has been issued for this specific course since 1996 and in that time over 300 electricians have been trained from all over the world. Although Sparco Training is a very small consultancy it has become a recognised force within the international drilling industry.

**Dates:** Please contact us for courses delivered at our Cyprus training centre

## **Section 5: Customised Courses**

In addition to our standard scheduled programmes, customised courses can be designed to clients' specific requirements and duration. Whether a single day training or a full staff development programme over several months, the Faraday Centre's extensive experience can help to achieve clients' training objectives.

Course content and duration can be designed to suit clients' needs:

- Tailor the content and duration of our existing course(s).
- Combine contents of existing scheduled courses.
- Design hands-on practical training to suit clients' environment.
- Develop new training solutions to client specifications.

Training programme can be delivered at our training facilities in Middlesbrough UK, Limassol Cyprus and, where practicable, on-site at clients' premises in the UK and overseas. For further information, please contact the Faraday Centre to discuss your specific training requirements.

## **Section 6: High Voltage Safety Rules/Documents Audit & Development**

The Faraday Centre offers consultancy service in auditing and developing high voltage safety rules/documents and operational procedures designed specifically to meet client's requirements, complying with

- Electricity at Work Regulations 1989
- Management of Health & Safety at Work Regulations 1999
- Health & Safety at Work Act 1974

It covers the selection, use, care and maintenance of 3-phase electrical switchgear up to 33kV AC (oil, air, SF6, vacuum). The high voltage safety rules/documents will include:

- Operation of electrical supply systems
- Access to high voltage switchroom
- Operation of switches and isolators
- Record Keeping
- Safe switchgear maintenance
- Safety lockout procedure
- Isolation of transformers
- Earthing
- Permit to Work, switching programme, sanction for test, limitation of access
- Danger / caution notices
- Commissioning and testing of switchgear
- Electric shock treatment

For further information, please contact the Faraday Centre to discuss your specific requirements.