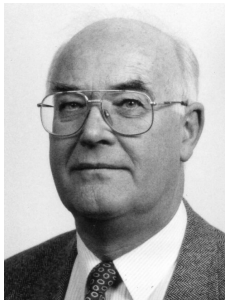
2nd run in Asia!

Maintenance of
Electrical Equipment in
Oil & Gas Installations

24 – 26 January 2011
Kuala Lumpur, Malaysia



With Jim Wardhaugh, B Eng, C Eng, MITE

Over 28 years with Shell, in roles including design, projects, procurement, construction, operation and maintenance of electrical generation and distribution systems up to 132kV.

Headed the electrical construction then permanent electrical organization of the Shell grass-roots refinery project at Rayong in Thailand. Prior to that he was the Chief Engineer (Electrical, Projects & Construction) in Shell Refinery, Pulau Bukom, Singapore.

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MAINTENANCE OF ELECTRICAL EQUIPMENT
24 - 26 January 2011, Kuala Lumpur

Why Attend this Course?

Many maintenance operations have shrunk in size and lost a significant amount of expertise. This is particularly true for electrical aspects. As a result the electrical maintenance efforts are often poorly focused and have high costs; despite the high costs these efforts do not deliver the results demanded by society, regulators or the business.

The course will provide those charged with leading electrical maintenance with the best practice know-how needed for:

- Safe operation
- High reliability at an optimised low cost and a
- Defensible approach to reliability, availability, sparing, integrity and safety.

The course balances an engineer's practical perspective with the demands of business needs. It meets the needs of technical people operating in a fiercely competitive market. Significant business benefits have been shown to flow from this gained competence.

About the Course

The course will provide participants with practical insights into the philosophies, approach, framework, tools and techniques involved in managing electrical equipment safely and cost effectively. This will be put into a holistic business context. The following give a flavour of the comprehensive cover of the subject.

- Use of a maintenance business model to identify:
  - Maintenance purpose from a business perspective
  - Key elements that bring high reliability and safety
- Classification of Hazardous Areas and selection of appropriate equipment
- Model Electrical Procedures as a framework for safe and cost effective activities.
  - These will include processes, authorisation & permit systems
  - The fundamentals of safe operation and work on electrical power systems
  - Model documentation will be supplied
- Influencing Design and Construction to get fit for purpose, correctly installed and maintainable equipment
- Commissioning needs of new (or repaired) equipment
  - Model forms will be provided
- Risk based approaches to effective, focused maintenance
  - Matrices to guide decisions
- Maintenance and monitoring approaches to specific equipment
  - Derivation of cost effective monitoring frequencies
  - Typical best practice frequencies will be provided
- Best work and organisational practices of top performing maintenance groups

Key learning points

At the end of the course participants will be able to explain:

- The key aims and issues in managing the maintenance of electrical equipment
- The performance and recipes for success of top performers
- How to commission, maintain and condition monitor most common electrical power equipment
- The fundamentals of safe operation and work on electrical power systems

The emphasis will be on the phases after design and construction i.e. the management of acceptance from projects and the activities thereafter which will ensure safety and cost effective reliability.

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Day 1

Introductions and admin matters
- Introduction of lecturer & participants
- Expectations
- Course focus and structure
- Exercise: Identification of maintenance goals and key elements to achieve them

Goals and Basics
- Discussion of key ingredients that bring maintenance success in a business context
- No silos…aligned groups

Effective Delivery of New Equipment
- Identifying the intent of the equipment
- Managing the different agendas of maintenance, design and construction
- Effective handover of new equipment

Commissioning Tests
- Scrutiny of the most popular and useful tests
- Test and handover forms
- Discussion: tests used by participants & benefits brought

Area Classification
- Different approaches to classification
- IEC, ATEX, NEMA terminology
- Electrical as a user of classification data

Equipment for Use in Hazardous Areas
- IEC-ATEX requirements
- Enclosure and protection approaches
- IEC-NEMA comparisons

Regulatory Requirements
- Rules & Regulations
- Relationships with regulators
- Modern trends (goals & safety case)

Managing Records & Documentation
- Use of CMMS as a structured repository
- ISO framework
- Library responsibilities
- Safety in Electrical Operation & Maintenance

Safety in Electrical
- Overview of safety rules, concepts & terminology
- Issue model rules
- Exercise: Key elements of safety rules

Day 2

Maintenance Approaches
- Time based, On condition, Reliability Centred Maintenance (RCM)
- Evolution to degradation management
- Exercise: Choosing the right maintenance option

Root Cause Analysis
- Basic tools and techniques used
- Vital tool used to eliminate problems
- Discussion: Effective implementation.

Monitoring the Health of the Equipment
- Condition monitoring theory & techniques used
- Specific regimes for most commonly encountered equipment
- Exercise: Tailored regimes for common equipment (scope & frequency)

Managing Risk
- Simple reliability terminology and formulae
- A variety of matrices will be given to assess risk, criticality of equipment functions, prioritise work etc
- Exercises: Use of matrices
- Exercise: Duty/standby modes for motor/pump combinations

Shutdowns & Turnarounds
- Recipe for shutdown top performers
- Performance definitions and numbers
- Exercise: Electrical role in a shutdown

Day 3

Top Maintenance Performers
- Performance definitions and numbers
- Characteristics of poor and top performers
- Exercise: Mapping own location onto characteristics of a top performer

Organising to Do the Work
- McGregor Theory X or Y
- Business Unit/Traditional/Hybrid
- Centralised/decentralised operations
- Manning levels
- Competence
- Role of CMMS
- Planning and scheduling issues
- Case Study: Maintenance department reorganisation in a large refinery

Budget Process
- Right costs are the result of doing right things
- Discussion: How do you achieve this?
- Maintenance Model
- Exercise: Summarising goals and key ingredients of a high reliability/availability operation

Course Wrap Up
- Summary of key points of the course
- Final questions
- Exercise: Individual action items for return to work
- Completion of Course Questionnaires

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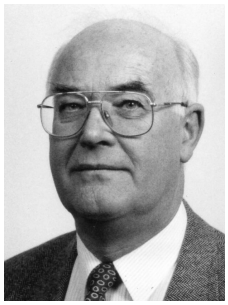
Delivery Methodology
The course will consist of a mix of lectures and small group exercises. Case studies will be extensively used to give improved perspectives.

Who Should Attend?
The course is intended for participants with incomplete knowledge of the concepts of managing an electrical maintenance organisation; but who will be called on to do the job.
This is a comprehensive core skills course for professionals. It deals with all significant aspects of the management of electrical commissioning, condition monitoring and maintenance. The course will be highly valuable to all those involved in this area of the business.

For other support personnel the course will produce useful insights and put into perspective the key issues and approaches that need to be effectively managed.



Your Expert Trainer: Jim Wardhaugh B Eng, C Eng, MITE

Jim is a graduate of the University of Liverpool, a Chartered Engineer, and spent a number of years in electrical utilities, then about 30 years with Shell in many different international offices in hands-on and managerial roles. These roles included design, projects, procurement, construction, operation and maintenance of electrical generation and distribution systems up to 132kV.

In his last position with Shell he headed the electrical construction then permanent electrical organization of the Shell grass-roots refinery project at Rayong in Thailand. Prior to that he was the Chief Engineer (Electrical, Projects & Construction) in Shell Refinery, Pulau Bukom, Singapore. Jim was also the head Engineering Quality and Training at the Rayong Refinery.

Significant periods of his career have been spent in UK, Holland, France, Singapore, and Thailand. Other short assignments were carried out in many other countries such as South Africa, Australia, Taiwan, India and Dubai. This variety has provided a rich multi-cultural perspective.

Jim is now active in the provision of consultancy and training. He targets performance improvement in asset management, operation, and maintenance. He has had recent significant involvement in advising and training on maintenance best practices for Reliance India.

He is also a visiting lecturer at Robert Gordon University Aberdeen on their Asset Integrity Management MSc Course.

Jim is joint author (with Vee Narayan and Mahen Das) of 100 Years in Maintenance and Reliability ISBN 978-0-8311-3323-8 Published by Industrial Press. This has been adopted by a number of blue chip companies (e.g. Shell) as the text for their maintenance courses.

About petroEDGE

The core competencies of professionals in the Oil & Gas industry are constantly evolving. To meet this ever growing gap, PetroEDGE Strategic Learning Solutions provides targeted up- to-date, practical and technically sound training solutions that enable engineers to be continuouslyrelevant in industry.

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Kuala Lumpur, Malaysia	Early Bird Price	√	Normal Price	√	
3 – Day, Maintenance of Electrical Equipment in Oil & Gas Installations	**S$ 2799**		**S$ 2999**		**TEAM DISOUNTS** PetroEdge recognises the value of leaning in teams. Group bookings at the same time from the same company receive the following: 3 or more at 5% off 5 or more at 7% off 8 of more at 10% All other promotions including early bird is exclusive of the group discount.
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Delegate 2:

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