COURSE OVERVIEW ME0382
Couplings & Shaft Alignment

Course Title
Couplings & Shaft Alignment



Course Date/Venue
Session 1: April 25-29, 2027/Meeting Plus 9, City Centre Rotana, Doha, Qatar
Session 2: November 07-11, 2027/Meeting Plus 9, City Centre Rotana, Doha, Qatar

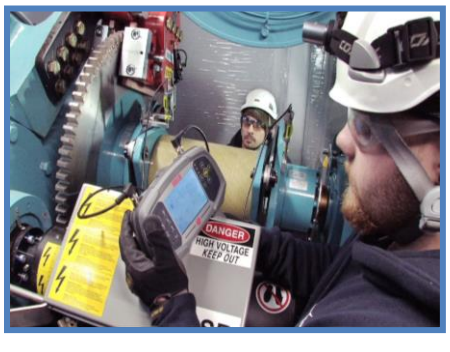
Course Reference
ME0382

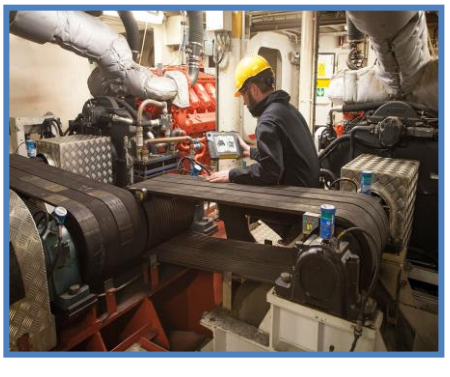


Course Duration
Five days/3.0 CEUs/30 PDHs

Course Description







This practical and highly-interactive course includes practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date overview of couplings and shaft alignment. It covers the mechanical systems, types of couplings, components of a coupling and coupling materials; the principles of shaft alignment and shaft alignment methods; the rigid couplings, flexible couplings and specialty couplings; the causes and effects of coupling failures; the proper maintenance, inspections and replacement of couplings dial indicators; the laser alignment tools and other instruments; the causes of soft foot and setting tolerances for different machines; and applying pre-alignment checks by ensuring correct conditions for alignment.

During this interactive course, participants will learn the graphical methods, reverse dial indicator method and laser alignment; the thermal growth and dynamic movement; identifying, measuring and correcting pipe strain effects on alignment; the differences, challenges and solutions of coupling and shaft alignment in vertical machines; the effects of misalignment covering mechanical seal failures, bearing failures, vibration and other consequences; the common problems in couplings and shaft alignments; ensuring longevity and efficiency in couplings and alignments; and the digital solutions in alignment.

Course Objectives/Outcomes & Benefits for the Participants

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on couplings and shaft alignment
- Discuss the types, application and operation of couplings including its classification and rigid characteristics Discuss mechanical systems, types of couplings, components of a coupling and coupling materials
- Recognize the principles of shaft alignment and apply shaft alignment methods
- Identify rigid couplings, flexible couplings and specialty couplings as well as the causes and effects of coupling failures
- Carryout proper maintenance, inspections and replacement of couplings
- Use dial indicators, laser alignment tools and other instruments and identify the causes of soft foot
- Set tolerances for different machines and apply pre-alignment checks by ensuring correct conditions for alignment
- Apply graphical methods, reverse dial indicator method and laser alignment
- Discuss thermal growth and dynamic movement as well as identify, measure and correct pipe strain effects on alignment
- Identify the differences, challenges and solutions of coupling and shaft alignment in vertical machines and the effects of misalignment covering mechanical seal failures, bearing failures, vibration and other consequences
- Identify common problems in couplings and shaft alignments, ensure longevity and efficiency in couplings and alignments and apply digital solutions in alignment

Exclusive Smart Training Kit - H-STK®



*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of couplings and shaft alignment for engineers and maintenance planners involved in machine's condition monitoring, professionals dealing with the operation and maintenance of rotating equipment, maintenance technicians who are in charge of correcting the machinery problems, new technicians who wish to improve knowledge and skills as well as all those involved in condition monitoring and vibration analysis.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Haward's certificates are accredited by the following international accreditation organizations:

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Fee

US$ 6,000 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



Mr. Pete Du Plessis is a **Senior Mechanical Maintenance Engineer** with over **30 years** of practical experience within the **Oil**, **Gas** and **Petrochemical** industries. His expertise includes **Reliability** Management, **Reliability Design** Techniques, **Reliability** Modelling, **Reliability** Techniques, Advanced **Root Causes** Analysis & Techniques, Creative **Problem Solving & Failure Analysis** Methodologies, Plant & Equipment Specification & Functions, **Cost Effective** Procedures, Dynamics of Machines, Reliability, Maintenance, Integrity & Inspection, **Maintenance** Management, **Maintenance Planning**, **Shutdown & Turnaround**, **Mechanical** Troubleshooting, **Preventive & Predictive Maintenance**, **Condition Monitoring**, Start-up & Commissioning, **Process Plant Commissioning**, **Cost Estimation**, **Dynamic Hydraulic** Testing, **COSHH**, **P&ID Reading**, **Engineering Drawings**, **Piping & Instrumentation Diagrams**, **Isometrics Drafting**, **Control & Safety Systems**, **PFD**, **Process Safety**, **Process** Troubleshooting & Problem Solving, Process Hazard Analysis (**PHA**), **Pumps**, **Compressors**, **Bearings**, **Lubrication**, **Process Safety** Management, **Risk Assessment** within Production Operation, **Hazard** Identification, **Safety Auditing**, **Site Inspection**, **Quantified Risk Assessment**, **HAZOP Studies & Leadership**, **FMEA**, Waste Management, Industrial Effluents, **Hazardous Material**, Chemical Handling, Emergency Response Services, **HAZCOM**, **HAZWOPER**, **HAZMAT**, Environmental Management (**ISO 14001**), Safety Management (**OHSAS 18001**) and Quality Management (**ISO 9001**).

While Mr. Du Plessis has been very active in the process industry he has likewise headed Consultancy projects for major **petrochemical companies**. In all his projects, he utilizes a systems approach which includes **risk management**, **process safety**, health & environmental management, human behaviour and quality management. Furthermore, he has come to share his expertise through the **numerous international trainings** he has held on **PHA**, **HAZOP**, **Risk Assessment**, Handling **Hazardous Materials** & Chemicals, Petroleum Products Handling & Transportation. Moreover, he completed various assignments as a consultant, trainer, facilitator, auditor & designer and conducted numerous licensed international Safety, Technology and Auditing Awareness & Implementing training courses including **IMS**, **ISO 9001**, **ISO 14001**, **ISO 27001**, **ISO 17799**, **OHSAS 18001** audits & assessments. With his accomplishments and achievements, he had been a **Safety Superintendent**, **Senior Safety Official** and **Senior Process Controller** for several international petrochemical companies.

Mr. Plessis has **Bachelor** degree with **Honours** in **Industrial Engineering** & **Management**. Further, he has gained **Diploma** in **Quality & Production Management**. He is also a **Certified Assessor** & **Moderator** with the Manufacturing, Engineering & Related Services Education and Training Authority (MERSETA), a **Certified Trainer/Assessor** by the **Institute of Leadership & Management** (**ILM**) and a **Certified Instructor/Trainer** by the APICS. He has further delivered numerous trainings, courses, seminars, conferences and workshops internationally.

Training Methodology

Our courses employ an interactive, learner-centred methodology that integrates theoretical knowledge with practical application. The training is delivered through a suitable combination of some or all of the following methods, selected according to the course content and learning objectives:

- Instructor-led presentations and facilitated discussions
- Practical workshops and participant presentations
- Hands-on exercises and real-world case studies
- Equipment demonstrations and technical drawings
- Hardware- and software-based simulations
- Gamification & Role Play in soft-skills courses only
- Virtual Reality (VR) and Augmented Reality (AR)
- Instructional videos and other relevant training resources

This blended approach encourages active participation, strengthens practical skills and supports the effective application of acquired knowledge in the workplace.

Learning Design & Customization

This course can be customized to the exact requirements of clients. Haward Technology is so proud of our huge capabilities in tailoring our courses to the training needs of our valued clients.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Overview of Mechanical Systems**: Brief on Machinery Components, Shafts & their Importance.*
0930 - 1030	***Types of Couplings**: Introduction to Rigid & Flexible Couplings their Applications & Selection Criteria*
1030 – 1045	*Break*
1045 - 1130	***Components of a Coupling**: Elements Like Hubs, Spacer & Fasteners*
1130 – 1230	***Coupling Materials**: Understanding Various Materials Used & their Properties*
1230 – 1245	*Break*
1245 – 1330	***Principles of Shaft Alignment**: Introduction to Alignment, Its Necessity & Benefits*
1330 - 1420	***Methods of Shaft Alignment**: Visual, Straightedge, Feeler Gauge & Rough Alignment*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Rigid Couplings***: *Sleeve, Flange & Clamping Types*
0830 - 0930	***Flexible Couplings***: *Gear, Elastomeric, Grid, Chain, Disc & Universal Joint Couplings*
0930 – 0945	*Break*
0945 – 1100	***Specialty Couplings***: *Fluid, Magnetic & Diaphragm Couplings*
1100 – 1230	***Coupling Failures***: *Causes, Effects & Identifying Signs of Coupling Wear & Damage*
1230 – 1245	*Break*
1245 – 1330	***Coupling Maintenance***: *Basics of Maintenance, Inspection & Replacement*
1330 - 1420	***Case Study***: *Real-World Analysis of a System with a Failed Coupling & its Troubleshooting*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Alignment Instruments***: *Dial Indicators, Laser Alignment Tools & Other Instruments*
0930 – 0945	*Break*
0945 – 1100	***Soft Foot***: *Identification, Causes & Correction*
1100 – 1230	***Alignment Tolerances***: *Understanding & Setting Tolerances for Different Machines*
1230 – 1245	*Break*
1245 – 1330	***Pre-Alignment Checks***: *Ensuring Correct Conditions for Alignment (Machine Condition, Environment)*
1330 - 1420	***Graphical Methods***: *Rim & Face Method*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 - 0930	***Reverse Dial Indicator Method***: *Procedure, Benefits & Applications*
0930 – 0945	*Break*
0945 – 1100	***Laser Alignment***: *Principles, Benefits & Step-By-Step Process*
1100 – 1230	***Thermal Growth & Dynamic Movement***: *Effects on Alignment & Ways to Compensate*
1230 – 1245	*Break*
1245 – 1330	***Dealing with Pipe Strain***: *Identifying, Measuring & Correcting Pipe Strain Effects on Alignment*
1330 - 1420	***Coupling & Shaft Alignment in Vertical Machines***: *Differences, Challenges & Solutions*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5:

0730 – 0930	***Effects of Misalignment***: *Mechanical Seal Failures, Bearing Failures, Vibration, & Other Consequences*
0930 – 0945	*Break*
0945 – 1100	***Case Study***: *Real-World Analysis of a Misaligned System its Detection & Corrective Measures*
1100 – 1230	***Troubleshooting***: *Identifying Common Problems in Couplings & Shaft Alignments*
1230 – 1245	*Break*

1245 – 1315	***Best Practices**: Ensuring Longevity & Efficiency in Couplings & Alignments*
1315 - 1345	***Digital Solutions in Alignment**: Introduction to Software, Apps & Modern Tools for Alignment*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the state-of-the-art simulator "iLearnVibration".



iLearnVibration Simulator

Course Coordinator

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