COURSE OVERVIEW RE0242-4D
Laser Alignment Technique

Course Title
Laser Alignment Technique

Course Date/Venue
September 02-05, 2024/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
RE0242-4D

Course Duration/Credits
Four days/2.4 CEUs/24 PDHs

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of laser alignment. It covers the laser alignment techniques and maximum utilization of existing FixturLaser functions; the importance of proper shaft alignment and the symptoms of misalignment; the foundations, baseplate, piping effects and various types of couplings, flexible and rigid couplings; the alignment and coupling tolerances and the preliminary alignment checks; the different lasers and detectors systems and the advantages of laser alignment; and laser alignment procedures, mathematical relationships and "on board" laser alignment calculations.

At the end of the course, participants will be able to carryout adjustments for thermal growth; identify "hot" alignment versus "cold" alignment and moving machinery in the field; evaluate alignment considerations for specific equipment including electric motors, pumps, gear boxes, compressors, cooling towers, blowers & fans & internal combustion engines; and prevent misalignment severity and vibrations caused by misalignment.

Course Objectives

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

- Apply proper techniques and good working knowledge on shaft alignment using laser method
- Improve the skills of laser alignment techniques and maximum utilization of existing FixturLaser functions
- Identify the importance of proper shaft alignment and the symptoms of misalignment
- Discuss the foundations, baseplate, piping effects and enumerate various types of couplings, flexible and rigid couplings
- Identify alignment and coupling tolerances and perform the preliminary alignment checks
- Enumerate the different lasers and detectors systems and state the advantages of laser alignment
- Apply laser alignment procedures, analyze mathematical relationships and perform "on board" laser alignment calculations
- Carryout adjustments for thermal growth, "hot" alignment versus "cold" alignment and moving machinery in the field
- Evaluate alignment considerations for specific equipment including electric motors, pumps, gear boxes, compressors, cooling towers, blowers & fans & internal combustion engines
- Prevent misalignment severity and vibrations caused by misalignment

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, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.*

Who Should Attend

This course covers systematic techniques and methodologies on laser alignment for those who are involved in the design, maintenance, or repair of rotating equipment.

Training Methodology

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Workshops & Work Presentations
30% Case Studies & Practical Exercises
20% Software, Simulators & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

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

Certificates are accredited by the following international accreditation organizations:-

- 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 **2.4 CEUs** (Continuing Education Units) or **24 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.

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. 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.

Course Fee

US$ 4,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

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

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. Dimitry Rovas, CEng, MSc, PMI-PMP, SMRP-CMRP, is a **Senior Maintenance Engineer** with extensive industrial experience in **Oil**, **Gas**, **Power** and **Utilities** industries. His expertise includes **Process Plant Shutdown & Turnaround**, **Maintenance Optimization & Best Practices**, **Maintenance Auditing & Benchmarking**, **Reliability** Management, **Reliability Centered Maintenance Principles & Application**, **Efficient Shutdowns**, **Machinery Lubrication**, **Maintenance Planning & Scheduling**, **Coupling & Shaft Alignment** Techniques, **Laser Alignment** Techniques, Optimizing Equipment Maintenance **& Replacement Decisions**, Maintenance Management & Cost Control, **Preventive & Predictive Maintenance**, **Effective Reliability** Maintenance & Superior Maintenance Strategies, **Integrity & Asset** Management Certificate, **Reliability**, **Availability & Maintainability (RAM)**, Total Plant **Reliability Centered Maintenance**, **Maintenance & Reliability Best Practices**, **Turnaround & Outages**, **Process Plant Shutdown**, **Turnaround** & Troubleshooting, **Shutdown & Turnaround** Management, **Integrity & Asset** Management, **Maintenance Management** Best Practices, **Material Cataloguing**, **Maintenance Planning & Scheduling**, Effective **Reliability Maintenance**, **Maintenance Contracting & Outsourcing**, **Maintenance Inventory**, **Materials Management**, **Mechanical & Rotating Equipment** Troubleshooting & Maintenance, **Rotating Equipment Reliability Optimization**, **Computerized Maintenance Management System (CMMS)**, **Material Cataloguing & Specifications**, **Rotating Equipment** Maintenance & Troubleshooting, **Pump** Technology, **Pump** Selection & Installation, **Centrifugal Pumps & Troubleshooting**, **Reciprocating & Centrifugal Compressors**, **Compressor** Control & Protection, **Gas & Steam Turbines**, **Turbine** Operations, **Gas Turbine** Technology, **Valves**, **Bearings & Lubrication**, Advanced **Machinery Dynamics**, **Rubber Compounding**, **Elastomers**, **Thermoplastic**, **Industrial Rubber Products**, **Rubber** Manufacturing Systems, **Heat Transfer**, **Vulcanization Methods**, **Energy Conservation**, **Energy Loss Management** in Electricity Distribution Systems, **Energy Saving**, **Thermal Power Plant** Management, **Thermal Power Plant** Operation & Maintenance, **Heat Transfer**, **Machine Design**, **Fluid Mechanics**, **Heating & Cooling Systems**, **Heat Insulation Systems**, **Heat Exchanger & Cooling Towers**, **Mechanical Erection**, **Heavy Rotating Equipment**, Material Unloading & Storage, Commissioning & Start-Up. He is currently the **Project Manager** wherein he is managing, directing and controlling all activities and functions associated with the domestic heating/cooling facilities projects.

During his life career, Mr. Rovas has gained his practical and field experience through his various significant positions and dedication as the **EPC Project Manager**, **Maintenance Manager**, **Field Engineer**, **Preventive Maintenance Engineer**, **Researcher**, **Instructor/Trainer**, **Telecom Consultant** and **Consultant** from various companies such as the Podaras Engineering Studies, Metka and Diadikasia, S.A., **Hellenic Petroleum Oil Refinery** and COSMOTE.

Mr. Rovas is a **Chartered Engineer** of the **Technical Chamber** of **Greece**. Further, he has **Master** degrees in **Mechanical Engineering** and **Energy Production & Management** from the **National Technical University of Athens**. Moreover, he is a **Certified Instructor/Trainer**, a **Certified Maintenance and Reliability Professional** (**CMRP**) from the Society of Maintenance & Reliability Professionals (**SMRP**), a **Certified Project Management Professional** (**PMP**), a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**) and a **Certified Six Sigma Black Belt**. He is an active member of Project Management Institute (**PMI**), Technical Chamber of Greece and Body of Certified Energy Auditors and has further delivered numerous trainings, seminars, courses, workshops and conferences internationally.

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: Monday, 2nd September 2024

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***The Importance of Proper Shaft Alignment***
0930 – 0945	*Break*
0945 – 1100	***Defining Misalignment***
1100 – 1215	***Symptoms of Misalignment***
1215 – 1230	*Break*
1230 – 1330	***Foundations, Baseplate & Piping Effects***
1330 -1420	***Various Types of Couplings, Flexible & Rigid Couplings***
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: Tuesday, 3rd September 2024

0730 – 0930	***Alignment & Coupling Tolerances***
0930 – 0945	*Break*
0945 – 1100	***Preliminary Alignment Checks***
1100 – 1230	***Lasers & Detectors***
1230 – 1245	*Break*
1245 – 1330	***Advantages of Laser Alignment***
1330 - 1420	***Techniques, Procedures & Applications of Laser Alignment (FixturLaser)***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

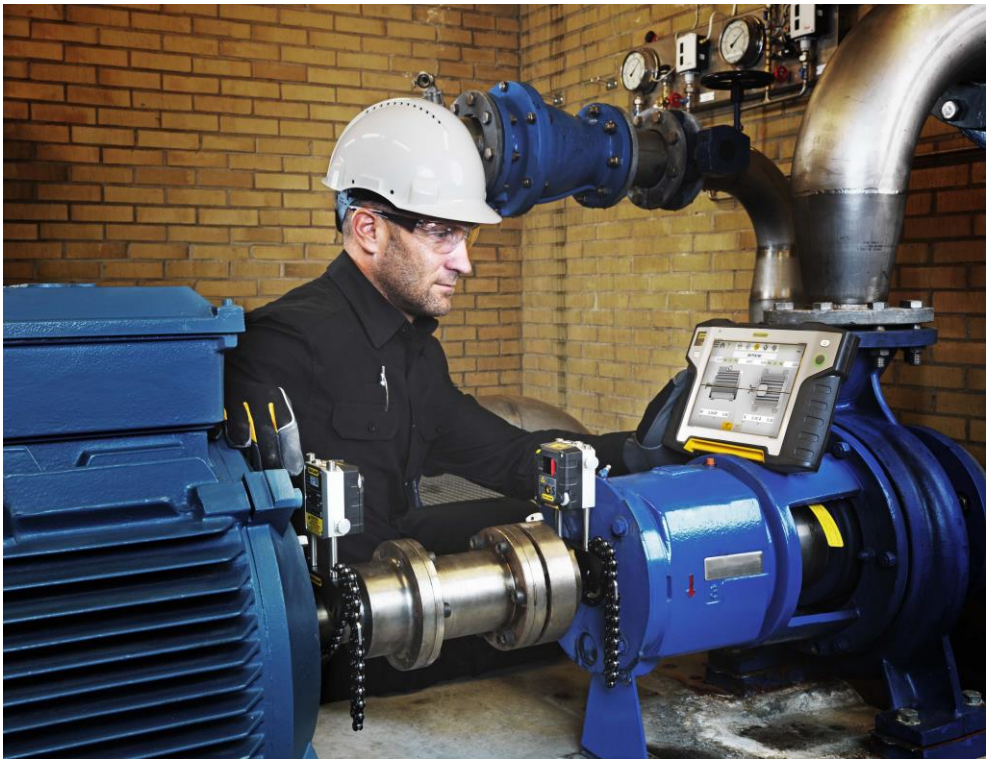
Day 3: Wednesday, 4th September 2024

0730 – 0930	***Identification & Correction of Softfoot, Horizontal & Vertical Machines & Machine Train Alignment***
0930 – 0945	*Break*
0945 – 1100	***Laser Alignment Procedures (Including Video Presentation)***
1100 – 1230	***"On Board" Laser Alignment Calculations***
1230 – 1245	*Break*
1245 – 1420	***Adjustments for Thermal Growth***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4:	***Thursday, 5th September 2024***
0730 – 0830	***"Hot" Alignment versus "Cold" Alignment***
0930 – 0945	*Break*
0945 – 1100	***Misalignment Severity***
1100 – 1215	***Vibrations Caused by Misalignment***
1215 – 1230	*Break*
1230 – 1300	***Vibrations Caused by Misalignment (cont'd)***
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org