



Course Information Letter ---- M205

MECHANICAL MAINTENANCE SKILLS M205

Skills typically required of a maintenance technician involve rigging and lifting heavy equipment, using precision measuring equipment to determine equipment condition, identification and choosing the correct valves, maintaining valves, and the alignment of rotating equipment. HPC thinks that a Maintenance technician should be able to perform work on these topics to the highest of standards. Highly skilled technicians, one these subjects specifically, can greatly affect the plant maintenance budget. It is the intent of this course to enhance these proficiencies. In each subject area we will review the basic tools used to accomplish the task at hand, we will compare different tools to make sure the best is chosen, we will review acceptable procedures for accomplishing the tasks, make careful notes of where there may be safety risks involved (as well as how to enhance safety), and finally we want to have the skills to evaluate the results.

HPC instructs this course with experienced “mechanics” (often 30+ year’s experience) that have the instructional skills as well. Much of the course is lecture, but it includes efficient use of lab equipment in HPC facilities so that important tasks are demonstrated and practiced (as needed). Case studies (examples of lessons learned) are included as well.

OBJECTIVES: At the completion of this course the participant will be able to:

1. Identify and describe those lifting devices and/or fixtures commonly used in an industrial facility.
2. Correctly choose the lifting equipment required for the safe and efficient lift of an assigned job task that involves a lifting procedure.
3. Visually inspect lifting devices used in the normal daily routine as they pertain to maintenance activities.
4. Select and use the proper precision measuring instruments for the assigned task.
5. Accurately measure equipment parts to determine their continued usefulness or warranted replacement.
6. Accurately set up, check and record the total indicator run out on a rotating element or shaft assembly.
7. Make valued judgments about equipment condition based on mechanical operating clearances.
8. Take and record mechanical sizes and conditions as they pertain to the manufacture of replacement parts.
9. Properly care for and store precision measuring instruments thus ensuring their readiness for and ability to take the next set of accurate readings.
10. Describe how to select and properly use ladders and scaffolding.
11. Explain the types and purposes of lubricants.
12. Identify the various types of bearings found in an industrial application.
13. Describe the various installation and disassembly of bearings.
14. Describe the fundamentals of vibration and its effects on rotating equipment.
15. Demonstrate the use of basic shop calculations.
16. Correctly align rotating equipment using several available alignment methods and procedures.
17. Describe the negative effects of misalignment on equipment and associated parts.
18. Inspect equipment foundations and related piping as they relate to equipment alignment.
19. Describe and address both parallel and angular alignment concerns.
20. Describe how to read and interpret drawings and prints.

SEMINAR OUTLINE

- Day One
 - Precision Measuring Devices:
 - Rules
 - Outside micrometers
 - Inside micrometers
 - Depth micrometers
 - Calculations:
 - Formulas
 - Units of measurements
 - Areas
 - Volumes
- Day Two
 - Rigging:
 - Slings
 - Wire rope
 - Lifting
 - Hoists
 - Cranes
 - Ladders and scaffolds
- Day Three
 - Bearings and Lubrication
 - Roller bearings
 - Plain bearings
 - Bearing failure
 - Gas lubricants
 - Liquid lubricants
 - Semisolid lubricants
 - Lubricant application
- Day Four & Five
 - Rotating Machinery Alignment and Vibration
 - Misalignment
 - Soft foot
 - Thermal expansion
 - Rim and Face method
 - Reverse dial method
 - Machinery vibration
 - Vibration measuring
 - Vibration monitoring programs

WHAT YOU WILL RECEIVE:

1. 1 copy of Industrial Mechanics Text
2. A "Certificate of Completion" with 2.9 CEUs, authorized by the International Association of Continuing Education and Training.

COURSE DATES/LOCATION/FEE:

For current dates / locations / prices, please see HPC's website, www.hpcnet.com.

FREQUENTLY ASKED QUESTIONS

- Will HPC Technical Services bring this course to our location for our personnel only? YES, call or e-mail Don Billings, dbillings@hpcnet.com for a price quotation.
- Will HPC Technical Services customize the presentation at our site to suit our particular needs? Yes.

MECHANICAL MAINTENANCE SKILLS

HPC TECHNICAL SERVICES

TEL: 941-747-7733 FAX: 941-746-5374

- Is HPC Technical Services' textbook available for purchase as a reference document? Coming Soon
- What is the cost for HPC Technical Service to deliver this course at our location? Well, of course that can vary, but generally speaking, if you're planning on having 6+ attend, when considering your T&L; it is to your advantage to perform the course at your plant (office). You gain from the customization and price.
- Can HPC Technical Services provide "Technical Assistance" in conducting functional checkouts or troubleshooting problems? Yes we can. Call or contact Harold Parker, hparker@hpcnet.com for our rate sheets and any further information required.

POWER PLANT MAINTENANCE CERTIFICATION:

This course is a requirement for Power Plant Maintenance Certification. Those who attend this course are automatically qualified to take HPC Technical Services' Certification Examination. This examination is offered at no additional expense to the participant. An 80% passing grade is required. The examination length will not exceed 2-hours. Those who complete this examination will receive a revised "certificate of completion" that recognizes this accomplishment along with two-copies of a "To Whom It May Concern" letter that states their accomplishment. (Two copies are provided, one for the participants' employer and one for the participants' personal file.)

Consult HPC's website, www.hpcnet.com, for details on this certification program.

INSTRUCTOR(S):



Dan Anderson started his career in the US Navy as a Boiler Technician. After his discharge Dan was a civilian instructor for the US Navy at Great Lakes Naval Training Center. While there Dan instructed Navy personnel in the four-phase steam cycle including balance of plant equipment. In 1990 Dan returned to Minnesota and received his Minnesota State Chief A Engineers license. After a few years in the position as Chief Boiler Engineer For Green Giant Co. and Maintenance Manager for Minnesota Energy, Dan went to work for Hutchinson Utilities Commission in Hutchinson, Minnesota. His position there was Operator 1. His operational responsibilities included GE LM 6000 Combined Cycle, GE Frame 5 Simple Cycle, and a GE Frame 3 Combined Cycle. He also had operations of 6 Diesel Engines for power production. Dan joined HPC Technical Services, June 2001. His main area of instruction is Gas Turbine/Combine Cycle Fundamental, Steam Turbine/Generator Fundamentals, Mechanical Maintenance Courses, and The Boiler Training. Dan currently holds a Chief A Engineers License for Minnesota, A Chief NIULPE Certificate, NIULPE Instructor and Examiners Certificate, Chief ASOPE Certificate, and is a Member of ASME.

Ray Militello has approximately 30-years experience maintaining steam turbine generator equipment. He has worked as a Field Representative for GE Installation & Service Department, was employed as a Supervisor - Maintenance and Maintenance Planning with Southern California Edison Company. Ray also worked as Manager, Maintenance Training Services with HPC Technical Services for 4-years before deciding to become independent. Now Ray instructs specific turbine maintenance courses for HPC, depending upon availability. He has been instructing HPC's Steam Turbine Overhaul course for the last 6-years. Ray resides in Bradenton FL.

REGISTRATION FORM

Company: _____
 Plant: _____
 Address: _____
 City/State/Zip: _____
 Telephone: _____ Fax: _____
 Course Number/Title: _____
 Course Dates: _____ / _____ / _____ Thru _____ / _____ / _____
 Course Location: _____ Course Fee: _____

PLEASE ENROLL THE FOLLOWING INDIVIDUAL(S) LISTED BELOW:

Student #1: _____ E-mail: _____
 Student #2: _____ E-mail: _____
 Taking advantage of HPC's 3-4-2 Policy: Send 3, Pay for 2 when paying in advance.
 Student #3: _____ E-mail: _____
 Enrolled by: _____ E-mail: _____
 Date: _____

METHOD OF PAYMENT

Check to Follow: _____
 Check Enclosed #: _____
 MC/Visa/AMEX #: _____
 Expiration Date: _____ CV Code: _____
 Purchase Order #: _____

PLEASE ADVISE HOW YOU INITIALLY FOUND OUT ABOUT THIS COURSE:

Website Search Familiar with HPC
 Fax Advertisement HPC Newsletter
 Magazine Advertisement Other: _____