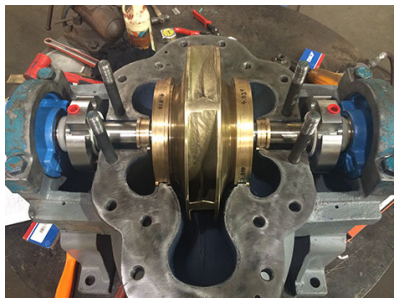
Centrifugal Pumps — Advanced Repair and Rebuilding

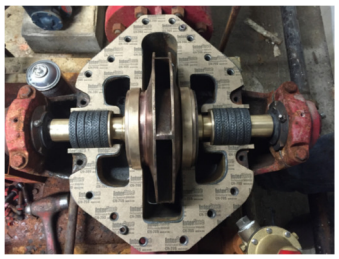
CPS-302

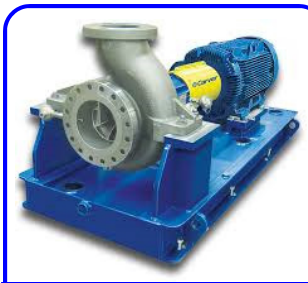
Description: The advanced rebuilding of split case pumps (impeller between the bearings) and API (American Petroleum Institute) are complex and too time consuming to cover in our regular pump rebuilding course. This training class is unique because it has 90% hands-on activities. Attendees are trained using applicable video and component construction models and then break into groups to rebuild the pumps. Each pump takes about 8 hours to rebuild. Each attendee gets to work on both types of pumps. Correct impeller setting, installation of mechanical seals, cutting and fitting packing, bearing change out, and proper impeller placement are covered. The attendee walks out of the course with a much better knowledge about how to determine the failure mechanisms for both pumps and learns to make proper repairs to produce a factory rebuild ready to be used. API pumps are built to more exacting standards than run of the mill ANSI pumps and require additional measurement and proper torqueing to facilitate proper repair. Spilt-case pumps are more difficult to rebuild because almost all the work must be done with the pump in place and piped up. The attendee should leave the course with the ability to rebuild pumps in a manner to get long life and proper hydraulic performance.

SPLIT CASE PUMPS

- Component identification and usage
  - o Upper and lower housing
  - o Gasketing and packing
    - Use of factory rebuilding set
    - Making gaskets and packing
  - o Shaft construction
    Making a shaft sketch
  - o Bearings housings and placement
  - o Coupling half—sliding and sweat fits
  - o Impeller—construction and placement
  - o Wear rings
- Disassembly and Inspection
  - o Use of witness marking
  - o Impeller placement
  - o Impeller inspection
    - For cavitation
    - For unbalance
    - For erosion and corrosion
  - o Shaft Inspection
    - Bearing seat area
    - Shaft straightness
    - Shaft run out
  - o Housing inspection
    - Bearing bore area
    - For corrosion and erosion
    - Evidence of impeller hitting
  - o Wear rings
    - Measurement and fit
  - o Packing or mechanical seal placement
  - o Other observations
- Impeller balancing
  - o Introduction to the balancing machine
  - o Single plane rotor balancing
  - o Adding or removing weight
- Re-assembly and Rebuilding
  - o Assembly of the rotating element
    - Bearings
    - Impeller
  - o Assembly of seals and packing
  - o Check for flatness and stoning
- Torqueing bolts and proper tightening sequence.
- End play and spin test

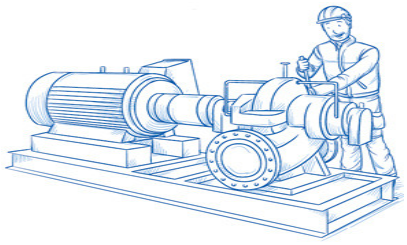






API PUMPS

- Component identification and usage
  - o Back pull out assembly
  - o Mechanical components
  - o Shaft construction
    - Making a shaft sketch
  - o Bearings housings and placement
  - o Impeller—construction and placement
  - o Wear rings
- Disassembly and Inspection
  - o Use of witness marking
  - o Impeller inspection
    - For cavitation
    - For unbalance
    - For erosion and corrosion
  - o Shaft Inspection
    - Bearing seat area
    - Shaft straightness
    - Shaft run out
  - o Housing inspection
    - Bearing bore area
    - For corrosion and erosion
    - Evidence of impeller hitting
  - o Wear rings
    - Measurement and fit
  - o Mechanical seal assembly
  - o Other observations
- Re-assembly and Rebuilding
  - o Assembly of the rotating element
    - Bearings
    - Impeller
    - Wear rings
  - o Assembly of seals and packing
  - o Torqueing and tightening



HANDS-ON ACTIVITIES

More than 90% of the course will be "hands-on" and each student will receive work books and supervised instruction as well as individual one-on-one assistance to make sure they can accomplish the tasks assigned. It is expected that an attendee will leave the class with the basic knowledge and skill to handle any API or split case pump rebuild. Class books can be used on the job site in the future to assist with troubleshooting steps and refresh the tasks that need to be done.

DURATION AND ATTENDANCE

Two day duration (7-1/2 hours each day) and up to 6 students may attend. Minimum of 6 students