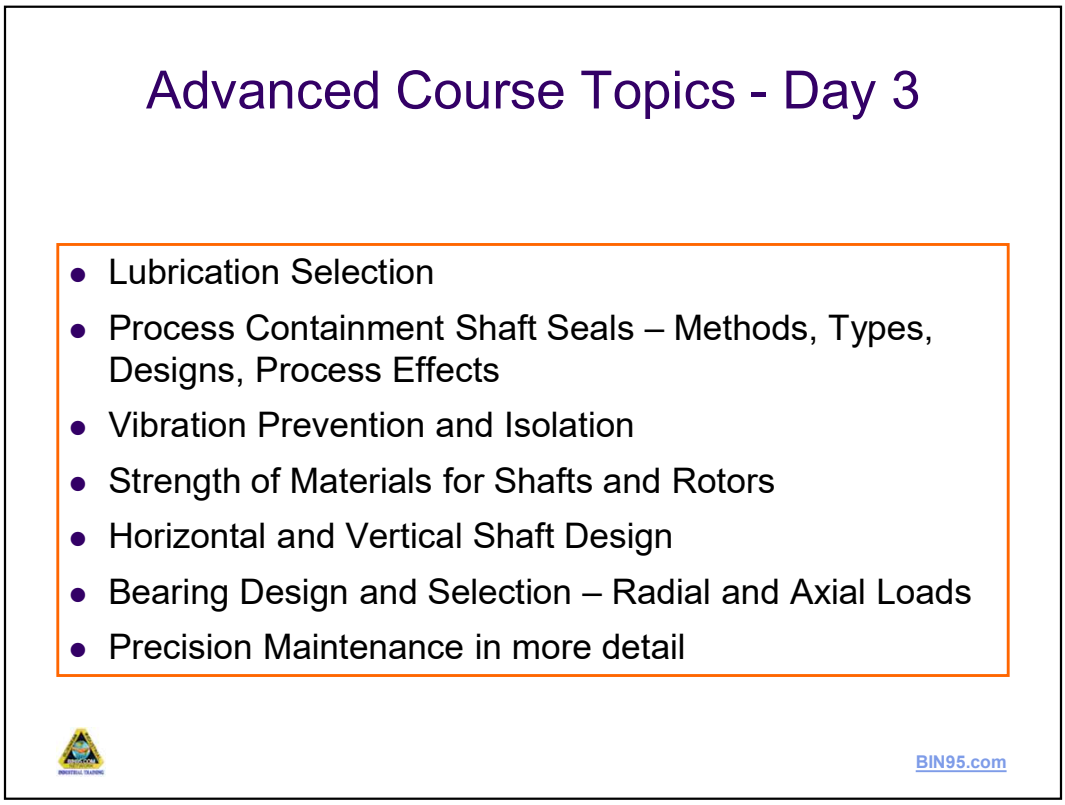
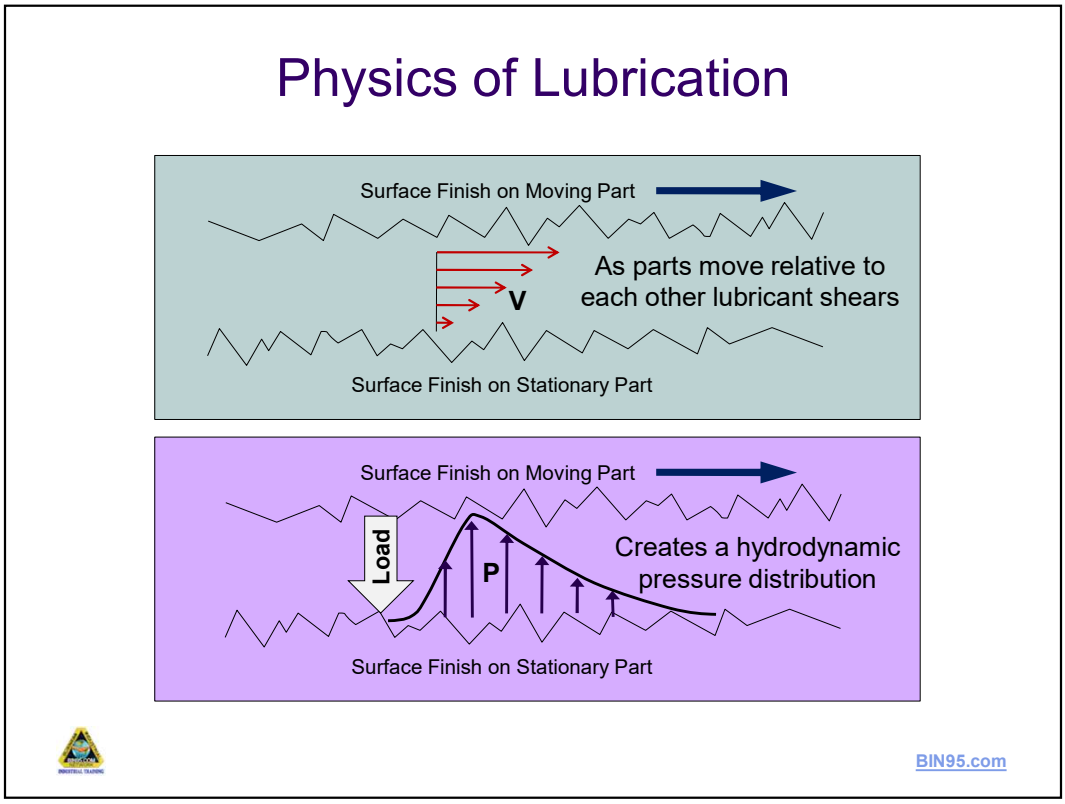


The content for third day of the course is listed in the table

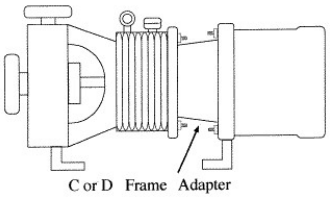


Lubrication theory explains how lubricants work. The model is based on fluid dynamics boundary layer theory. Fluid layers shear because of the different speeds each surface moves at. The shearing action combined with the imposed load carried by the lubricant produces a pressure gradient that forces the two surfaces apart and reduces friction between them.

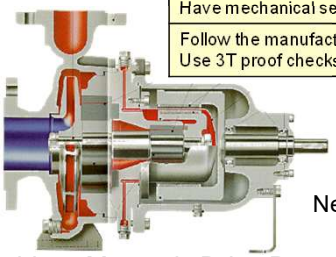
Long-life Seal Conditions

REQUIREMENTS FOR LONG MECHANICAL SEAL LIFE
a) **Achieve a healthy local environment** – clean; cool; lubricated; steady, positive process pressure
b) **Achieve precision assembly** – light frequency flatness; evenly loaded; central on shaft
c) **Achieve precision running** –alignment tolerance; balanced rotor; low vibration; central shaft rotation, negligible shaft bending

OPERATORS
Pressure hammer problems need to be found and fixed.
Keep the barrier fluid pressure slightly higher than the seal area pressure.
Run the pump at design flow and pressure. Never deadhead it.
MAINTAINERS
Ensure a clean flushing product or barrier fluid is provided to the seal faces. Make use of valves and pressure gauges to regulate the flow.
Align shafts to near perfection (within 0.05 mm, 0.002") at the operating temperature.
Have mechanical seals repaired by authorized repairers.
Follow the manufacturer's instructions during installation. Use 3T proof checks in procedures.



Never go out of alignment



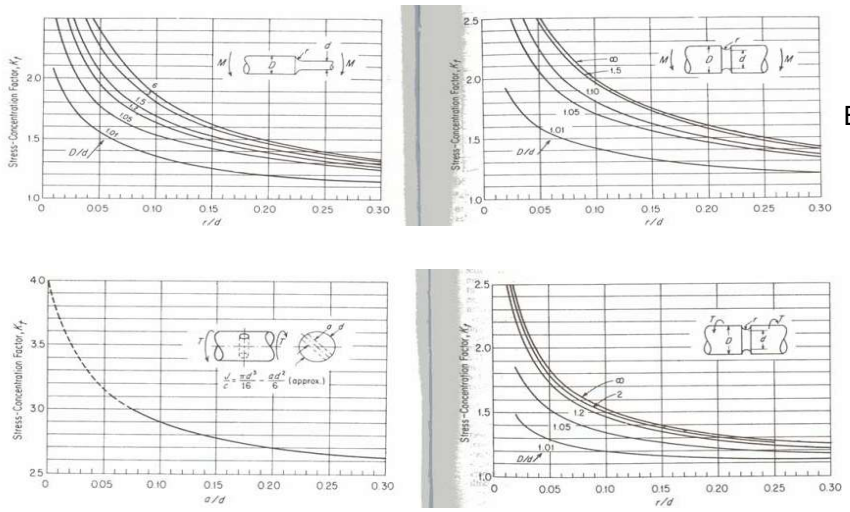
New technology for clean liquids

Seal-less Magnetic Drive Pump

BIN95.com

The two tables highlight the various requirements to have a long mechanical seal life. C and D frame adaptors are used to physically connect pumps to their drive motors so they can never go out of alignment. Magnetic drive pumps are seal-less and used for clean liquids.

Stress Concentration Effect



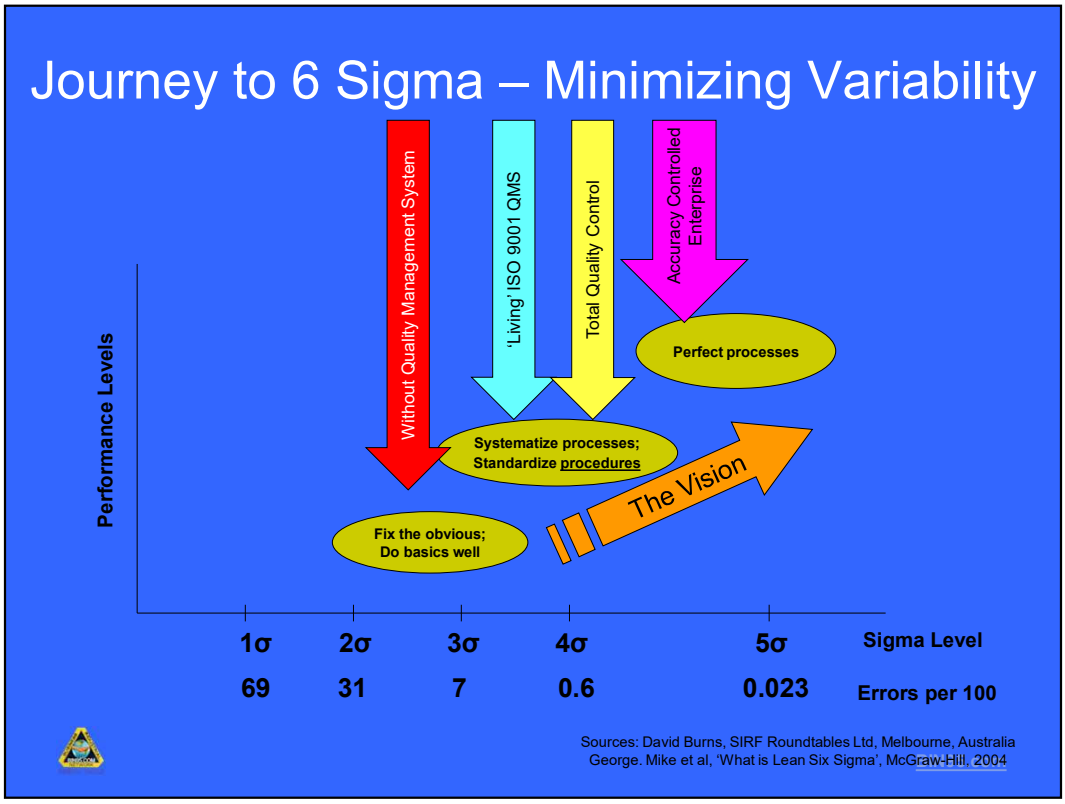
Bending

Stress factors add together when present together

Torsion

BIN95.com

Introducing changes in diameter or penetrations causes local stresses to rise. The more abrupt and sudden the change, the higher the stresses produced.



The slide explains the change in processes needed to

Developing Precision Skills

- In-house precision skills training
(coaching on-the-job; maximum skill and knowledge transfer)

- Third-party training providers *(classroom training needs to be supported with practice bench)*

- Center of Excellence *(The 'Precision Room' is a place to practice doing everything in perfection)*

BIN95.com