

# Course Topics

## Lubricant Analysis For Condition Monitoring

- Evolution of maintenance operation
- Effect of proper maintenance operations
- Cost of maintenance
- Integrated technologies
- Balancing monitoring programs, economically

## Friction & Lubrication

- Fundamentals of friction and wear
- Fundamentals of lubrication
- Review of lubrication regimes
- Methods of lubrication

## The 12 Mechanisms of Wear

- What are they and what causes them
- How to recognize them in failed components
- How to recognize them
- How eliminate them

## Additives and Their Functions

- Mineral and synthetic lubricants
- Physical & chemical additives
- Where they're used and why
- Where they're not used and why
- Gelling agents and grease

## Machine and Lubricant Combination

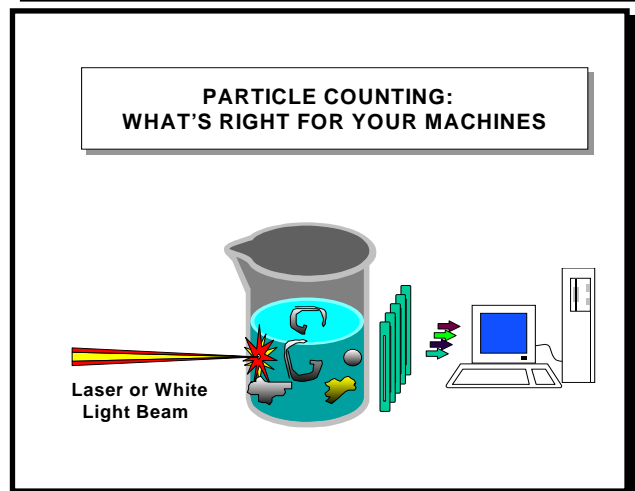
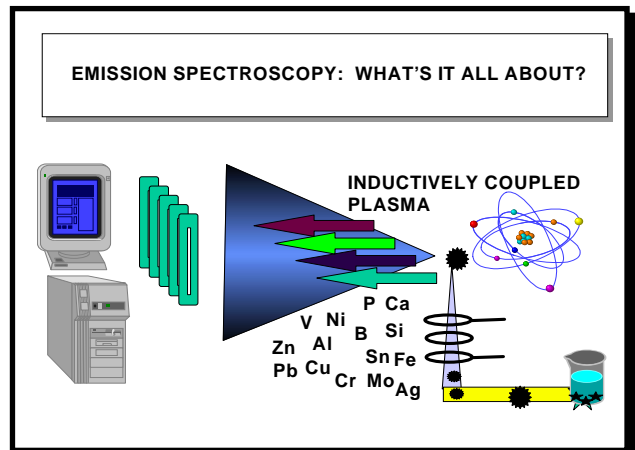
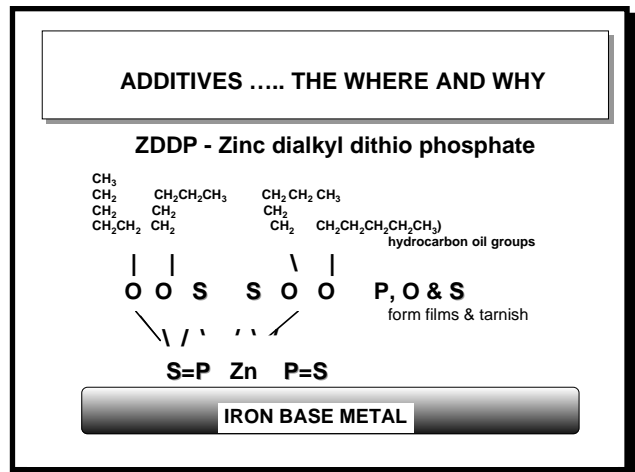
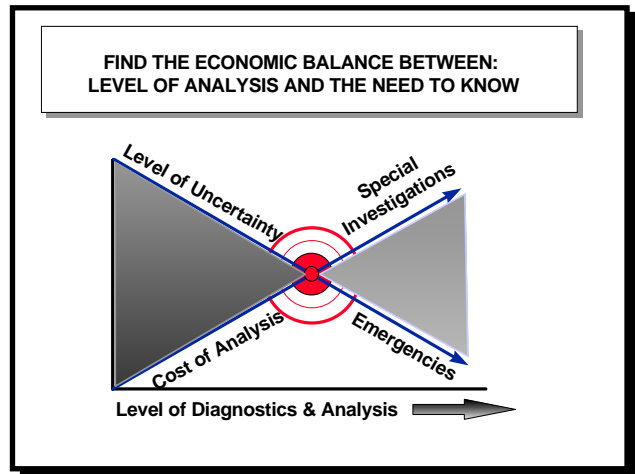
- Viscosity Specifications
- Turbines
- Pumps
- Compressors
- Gears
- Hydraulics
- Reciprocating engines
- Rolling element bearings

## Laboratory Methods for Measuring Wear Metals and Inorganics

- Emission spectroscopy
- Wear particle concentration
- Wear particle analysis
- Limitation of methods

## Laboratory Methods for Measuring Contamination

- Gaseous contaminants
- Fluid contaminants
- Solids contaminants
- Semi-solids contaminants
- Limitations of methods



# Course Topics

## Laboratory Methods for Measuring Remaining Useful life

- Rotating Bomb (RBOT)
- Differential Scanning Calorimetry (DSC)
- Fourier Transform Infrared (FT-IR)
- Remaining Useful Life Evaluation Routine (RULER)

## On-Site Evaluations and Instruments

- Simple on-site screening techniques
- How to set up a laboratory on-site for less than \$1,000
- Easy ways to control information
- On-site instruments, the good and bad

## Lube Oil and Grease Sampling Methods

- Where to sample and why
- How to sample different machines
- Sampling devices are not all the same
- Special situations, when you want to know more
- Sample containers and identification
- Sampling requirements for particle counts
- Grease: the forgotten sample

## Filtration Systems

- Filtration options: choose the right one
- Filter rating: do they really mean anything
- How did the debris get there in the first place
- Systems and their sensitivity to particles

## Sample Frequencies / Analysis Packages

- How to select equipment for condition monitoring
- How to select monitoring intervals
- Selecting specific analyses based on your machines
- Cycle analysis can get you more bang for your buck
- New product dedication and acceptance

## Interpreting Lubricant Analysis Reports

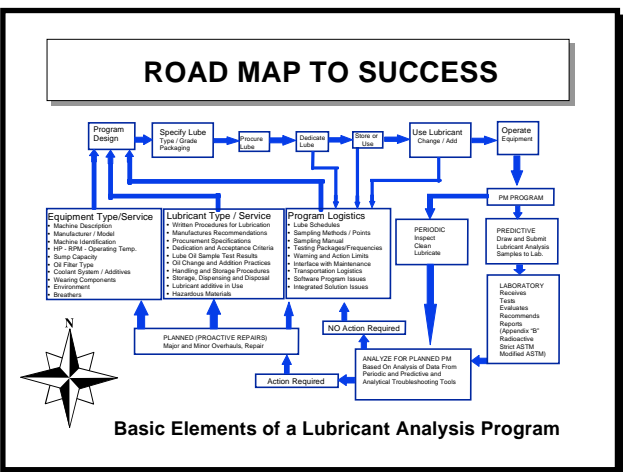
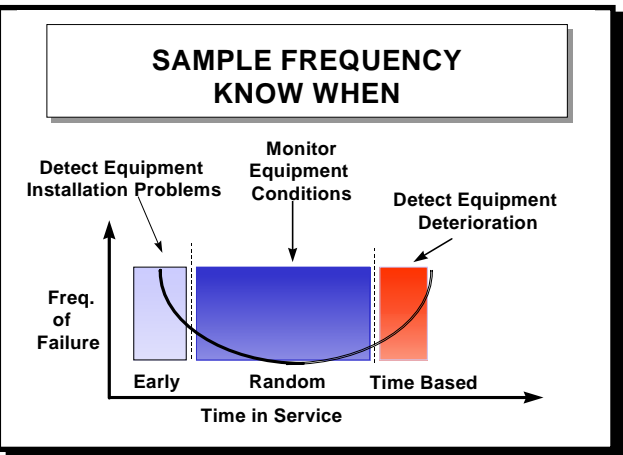
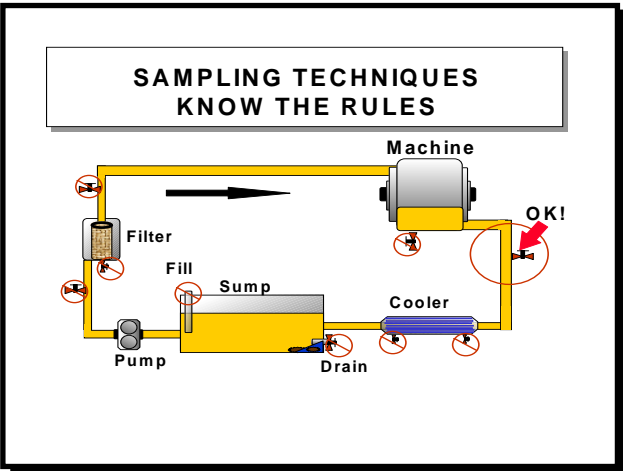
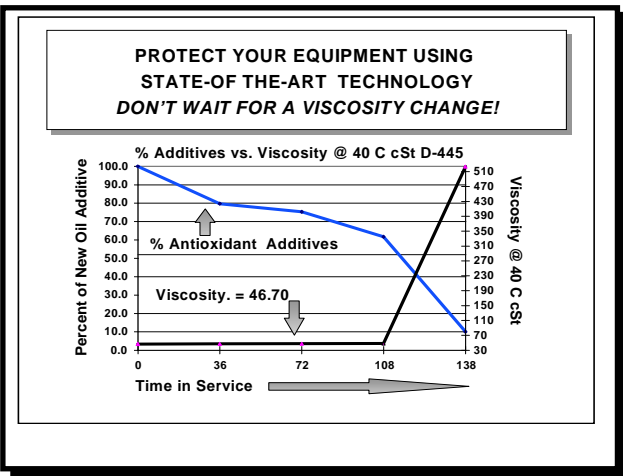
- Set Warning and Action Limits
- Class interpretation of actual sample reports
- Actions to take, making the tough decisions

## Program Planning

- Evaluating laboratories
- Plant review and situation analysis
- Procedure manuals for a successful program
- Supplies and logistics
- Software and data trending
- Implementation, training and stewardship

## Establishing a Corporate Action-Oriented Machine Condition Monitoring Program

- How to help develop a corporate philosophy
- Define "Controllable" factors
- Set short-term goals (1 year)
- Set long term goals (3 years)



## ***WHO SHOULD ATTEND?***

Maintenance, engineering, and operations personnel who are interested or responsible for planning, implementing, administering or supervising a lubricant analysis program. The course will feature a “hands-on” approach to understanding and managing lubricant analysis programs for equipment condition monitoring.

## **About the Course:**

Herguth Laboratories Inc. offers this unique condition monitoring workshop designed for operators, maintenance & management personnel of industrial plants. The course focuses on the specific machines, lubricants, and lubricant-related maintenance problems found in industrial plants.

How many times have you signed up for a “training course” only to find out it was a sales pitch, that you were paying for? This course is completely non-commercial in content, and I am so confident that you will be satisfied that I am offering my personal guarantee!

If you are not completely satisfied once you have completed the training course, I will refund 100% of your course fee .... “No Questions Asked”.

You have my personal guarantee!

William R. Herguth  
Herguth Laboratories, Inc.