This course can be adapted to virtual classroom mode

Lubrication & Technology of Industrial Equipment

5 days **LUBEI-EN-A**

Overview

LEVEL

Knowledge

PURPOSE

This course provides a deeper knowledge on the material and equipment to the non-mechanical people for a better understanding of the role of the lubricant. It presents the essential properties of lubricants depending on the equipment and their operating conditions.

LEARNING OBJECTIVES

Upon completion of the course, participants will be able to:

describe the different mechanical organs and machines used in the industry,

explain the role and the importance of the standardization in the field of lubrication and lubricants,

explain the mode of action of the lubricants and the properties required for a given application,

recommend a lubricant according the equipment and its operating conditions,

detect the origin of the equipment failures,

select a lubricant for a given equipment,

analyze lubricants in use.

WAYS AND MEANS

Interactive exercises with the teacher will be conducted to determine the lubricant to be used based on the technical data of the equipment and its operating conditions.

Interactive exercises of questions-answers between the participants using sets of play cards to synthetize the essential points of the lectures.

Agenda

GENERALITIES ON EQUIPMENT & REFRESHER ON LUBRICANT — 0.5 d

Description of the different basic mechanical organs; functional properties of lubricants; ISO standards of classification and specifications; physico-chemical characterization of products; chemical composition of lubricants.

LUBRICATION OF HYDRAULIC CIRCUITS — 0.75 d

Description of the different types of pumps, distribution and regulation (flow and pressure) organs. Hydraulic circuits. Functional properties of hydraulic fluids. Classifications and specifications of hydraulic fluids. How to recommend a hydraulic fluid. Hydraulic fluids in use (maintenance, filtration, follow-up). Pump failures: identification and remedies.

LUBRICATION OF MACHINE TOOLS — 0.25 d

Description of the different types of slide-ways and of their different lubrication requirements. Functional properties, classifications and specifications. Lubrication plans of machine tools. Possible problems in service.

LUBRICATION OF INDUSTRIAL GEARS

0.75 d

Description and functioning of the different types of gears (spur, helical, bevel, worm gears). Refresher on EHD lubrication. Functional properties, classifications and specifications, mechanical testing of industrial gear oils. Application modes of lubricants. Recommending a lubricant for a given gear set. Gear failures in service: identification and remedies.

LUBRICATION OF JOURNAL & ANTIFRICTION BEARINGS

0.75 d

Technology of journal and antifriction bearings. Refresher on the lubrication regimes (hydrodynamic, hydrostatic, boundary, mixed). Mode of application of the lubricants. Functional properties, classifications and specifications. Exercises for the selection of an oil for bearings. Failures of journal bearings and antifriction bearings in service.

LUBRICATION OF TURBINES & DYNAMIC COMPRESSORS

0.75 d

Description and functioning of steam, gas, combined cycle and hydraulic turbines, of axial and radial compressors. Lubrication circuits. Functional properties, classifications and specifications according to type of equipment. Follow-up in service and possible problems.

LUBRICATION OF VOLUMETRIC & REFRIGERATING COMPRESSORS

0.75 d

Description and functioning of reciprocating, rotary and refrigerating compressors. Refrigerating fluids (CFC, HCFC, HFC); replacement of CFC and HCFC. Functional properties, classifications and specifications, according to the type of compressed gas (air, industrial gas, refrigerating fluids). Exercise of selection of a refrigerating oil for a refrigerating compressor. Possible problems in service.

FOLLOW UP OF LUBRICANTS IN SERVICE

0.5 d

Interest. The different types of maintenance (preventive, conditional, healing). Ageing of the components, follow up of lubricants and machines. Management of analysis and analytical methods used. Analysis menus following the lubricants, periodicity of sampling. Interpretation of the analysis results.