

WATER ANALYSIS & LAB SAFETY



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TRAINING TITLE

WATER ANALYSIS & LAB SAFETY

VENUE

Dubai, UAE

DURATION

5 Days

DATES

29 September – 03 October 2019

PRICE

US\$4,000 per attendee including training material/handouts, morning/afternoon coffee breaks and Lunch buffet.

TRAINING INTRODUCTION

- A petroleum industry requires the water analysis from any sources and different using technique. Starting from analysis of the associated water produced with the crude oil and/or natural gas till the water analysis for different types of processing.
- This program presents an overview of the need for analysis of water, how analytical methods are developed and quality control is applied and how the results of analysis are used. It will describe the physical, chemical and other relevant properties of water components and will also cover sampling, cleanup, extraction and derivative procedures. Older techniques that are still in use will be compared to recently developed techniques and participants will be directed to future trends. A similar strategy will be followed for discussion of detection methods. In addition, the applications of analysis of water types (potable water, tap water, wastewater, seawater and associated produced water) will be reviewed.
- Because water is an excellent solvent, it dissolves many substances. To get correct results and values, analysts have to follow sample strategies. Sampling has become a quality-determining step. If samples can't be analyzed directly they have to be stored and preserved. Physical, chemical or biological activities in a water sample can distort the chemical composition in water. Statistical treatment of data ensures the reliability of

the results. Statistical methods will also be reviewed in this course.

- The course will deal with the water characteristics (physical, chemical and biological) and their analysis methods. Physical characteristics of water, such as temperature, color, turbidity, etc., will be discussed, in addition to hardness, acidity, alkalinity, antioxidant demand and how dissolved oxygen is detected.
- Water is a living element housing a lot of organisms, wanted or unwanted, harmful or harmless. Some of these organisms produce toxic substances. The course will discuss bacteriological and algal analysis. It will give participants detailed information on most of the cited techniques, sample preparation, separation and detection methods.

TRAINING OBJECTIVES

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

- Apply an up-to-date knowledge and skills on water analysis and quality control techniques
- Select proper water samples from different sources including seawater, formation water, Multi Stage Flash unit, boiler feed water, boiler blow down water, produced steam, condensate water and drain effluent water
- Practice the latest water analysis methods and use the correct analytical equipment to achieve the required results of pH value, conductivity, P&M alkalinity, chlorides, total hardness, NH₃ content, total dissolved salts, free chlorine & combined chlorine, dissolved oxygen, biological oxygen demand (BOD), chemical oxygen demand (COD), silica
- content, iron content, phosphate, turbidity, sulfate content, copper content, nitrates & nitrites content, color scale, oils & hydrocarbons .
- Implement the various laboratory methods and technology in water analysis including qualitative/quantitative analysis, titrimetric, potentiometry, volammetry, Colorimetry, spectrophotometry, chromatography and electronic emission spectroscopy
- Calculate errors, limitation and accuracy of the various analytical methods and calibrate the analytical equipment
- Employ a proper water quality monitoring program and carry out a quality assessment of water.

TRAINING AUDIENCE

- This program is intended for laboratory technicians, Chief Chemists, regulators and water industry professionals who plan and use the results of water monitoring programs and those who are carrying out water analysis.
- It is particularly aimed at young professionals and those who want to update their knowledge of water analysis.

TRAINING OUTLINE

Day 1:

- Introduction to analytical chemistry principles
- Element – Compound – Mixture – Solution
- Atoms, atomic weight and molecular weight
- Ions –valence – equivalent weight
- Acid – base – salt – concentration expressions
- pH scale – SI unit of measurement
- Water sample and analysis
- Chemical, physical and biological properties
- Qualitative and Quantitative analysis (Full analysis of water)
- Water constituents (Anions – Cations)

Day 2:

- Water external and internal treatment (Aeration – clarification and filtration)
- Different type of filters used in water treatment
- Graphical presentation of analysis results (water patterns)
- Oil in water analysis
- Suspended solids analysis
- Water quality for different usage
- Particle size analysis and distribution
- Oil field water analysis
- Microbiological Treatment Of Water
- Microorganism found in Oil Field Water Systems
- Bacteria which cause problems (SRB)
- Reservoir Souring

Day 3:

- Water Sampling For Bacteria
- Iron Oxidizing Bacteria
- Slime-forming bacteria
- Culturing, Identifying and Counting Bacteria
- Extinction Dilution Technique
- Chemical Control of Microorganisms
- Treatment Methods
- Water Disinfection
- Disinfection Media

Day 4:

- Chlorination and de-chlorination
- Advantages and disadvantages of using chlorine for disinfection
- Ozone disinfection
- Ozone Generation
- Ultraviolet Disinfection
- UV-treated water safe to drink
- Types of UV systems
- Component of a UV system
- Maintain a UV system
- ASTM and NACE Standard Tests

Day 5:

- Water Injection Systems
- Water Sensitive Formation
- Guidelines To System Design
- Types Of Treating Systems
- System Designs
- Water Injection System
- Water Disposal Systems
- Subsurface Disposal
- Produced Water Disposal
- Surface Disposal
- Treating Chemicals Toxicity

TRAINING CERTIFICATE

MAESTRO CONSULTANTS Certificate of Completion for delegates who attend and complete the training course

METHODOLOGY

Our courses are highly interactive, typically taking a case study approach that we have found to be an effective method of fostering discussions and transferring knowledge. Participants will learn by active participation during the program through the use of individual exercises, questionnaires, team exercises, training videos and discussions of “real life” issues in their organizations. The material has been designed to enable delegates to apply all of the material with immediate effect back in the workplace.