



**MIDDLE EAST UNITED CO FOR MAINTENANCE OF OIL FACILITIES, WELLS, REFINERIES, AND PETROCHEMICALS  
COMPANY, KUWAIT WLL  
(MEMOC)**

**BOILER WATER TREATMENT GUIDELINES**

Boiler water treatment is a process that involves the management and control of water used in boilers to ensure their efficient and safe operation. The primary goal of boiler water treatment is to prevent scale formation, corrosion, and fouling within the boiler system, which can reduce its efficiency and lead to equipment failure. This practice involves several principles and practices that I will explain below:

**Water Quality Analysis:** The first step in boiler water treatment is to analyze the water source to determine its quality. This analysis includes measuring parameters such as alkalinity, hardness, pH, dissolved oxygen, conductivity, and total dissolved solids (TDS). Understanding the water composition helps in designing an appropriate treatment program.

**Scale and Deposit Control:** Scaling occurs when mineral deposits, such as calcium and magnesium, precipitate and accumulate on the boiler surfaces. These deposits reduce heat transfer efficiency and can lead to overheating and equipment failure. Boiler water treatment uses chemical additives called scale inhibitors or dispersants to control and prevent scale formation.

**Corrosion Control:** Corrosion is another major concern in boiler systems, as it can lead to the degradation of metal surfaces. Corrosion inhibitors are added to the water treatment program to protect the internal surfaces of the boiler from corrosion. These inhibitors form a protective film on the metal surfaces and prevent the corrosive action of dissolved gases, oxygen, and other contaminants.

**Oxygen Removal:** Dissolved oxygen in the boiler feedwater can cause severe corrosion, particularly in the presence of high temperatures. Deaeration, which involves the physical removal of dissolved oxygen, is often employed using various techniques like mechanical deaeration or chemical oxygen scavengers.

**pH Control:** Maintaining the correct pH level in the boiler water is crucial to prevent corrosion and scale formation. The pH is controlled by adding chemicals called pH adjusters or alkalinity builders, such as sodium hydroxide or sodium carbonate. The ideal pH range for boiler water is typically between 9.5 and 11.

**Blowdown:** Regular blowdown of the boiler is necessary to control the concentration of dissolved solids in the water. Blowdown removes impurities that gradually accumulate in the boiler water, helping to prevent scale formation. It is essential to balance blowdown to minimize water and heat loss while maintaining proper water quality.

**Monitoring and Testing:** Continuous monitoring and regular testing of the boiler water are essential to ensure the effectiveness of the treatment program. This involves periodic checks of various parameters like pH, conductivity, alkalinity, and dissolved oxygen. Monitoring helps in detecting



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any deviations from the desired water quality and allows adjustments to be made accordingly.

**Training and Documentation:** Proper training of boiler operators and maintenance staff is vital to ensure the correct implementation of water treatment practices. Clear documentation of procedures, dosages of chemicals, test results, and maintenance activities helps in maintaining consistency and allows for troubleshooting and analysis of any issues that may arise.

It is important to note that boiler water treatment practices may vary depending on the specific type of boiler, its operating conditions, and the quality of the feedwater. Consulting with a qualified water treatment professional or referring to boiler manufacturer guidelines is recommended for a comprehensive understanding and implementation of boiler water treatment principles and practices.