

## Resolving Increased Water-Cut in South and East Kuwait Areas through Water Knock-Out Facility Project

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**Abstract :** The Water Knock-Out (WKO) facility project is to handle the undesirable impact of the increasing water production rate in South and East Kuwait (S&EK) areas and break the emulsions and ensure sufficient separation of water at the new upstream facility, to reduce the load on the existing separation equipment in the Gathering Centers (GC). As the existing separation equipment in the Gathering Centers are not efficient to separate the emulsions, the Compact Electrostatic Coalescer (CEC) and Vessel Internal Electrostatic Coalescer (VIEC) technologies have been selected for enhancing the liquid-liquid separation by using the alternating voltage/frequency on electrical fields, to handle the increasing water-cut in S&EK. In the Compact Electrostatic Coalescer (CEC) technology method, the CEC equipment is installed downstream of the inlet separator externally, whereas in the Vessel Internal Electrostatic Coalescer (VIEC) technology method, the VIEC is built inside the treater vessel, downstream of the inlet separator with advanced internals for implementing electrocoalescence of water particles and hence enhancing liquids separation. The CEC and VIEC technologies used in the Water Knockout Facility project has the ability to resolve the increasing water cut in the S&EK area and able to enhance the liquid-liquid separation in the WKO facility separation equipment. In addition, the WKO facility is minimizing the load on the existing Gathering Center's separation equipment, by tackling the high water-cut wells, upstream of each GC. The required performances at the outlet of the WKO facility are Oil in Water 100ppmv, Water in Oil 15% volume, liquid carryover in gas 0.1 US gal/MMSCFD, for the water cut ranging from 37.5 to 75% volume. The WKO facility project is used to sustain, support and maintain Greater Burgan production at 1.7 Million Barrels of Oil Per Day (MMBOPD), by handling the increasing water production rate.

**Keywords :** emulsion, increasing water-cut, production, separation equipment

**Conference Title :** ICFMA 2018 : International Conference on Facility Management and Applications

**Conference Location :** Sydney, Australia

**Conference Dates :** December 03-04, 2018