

C206 | Rosneft | Vankor Field

Produced Water Treatment Package



Project: Vankor Field

Contractor: IMS

End User: Rosneft

Product: Produced Water Treatment

Location: Russia

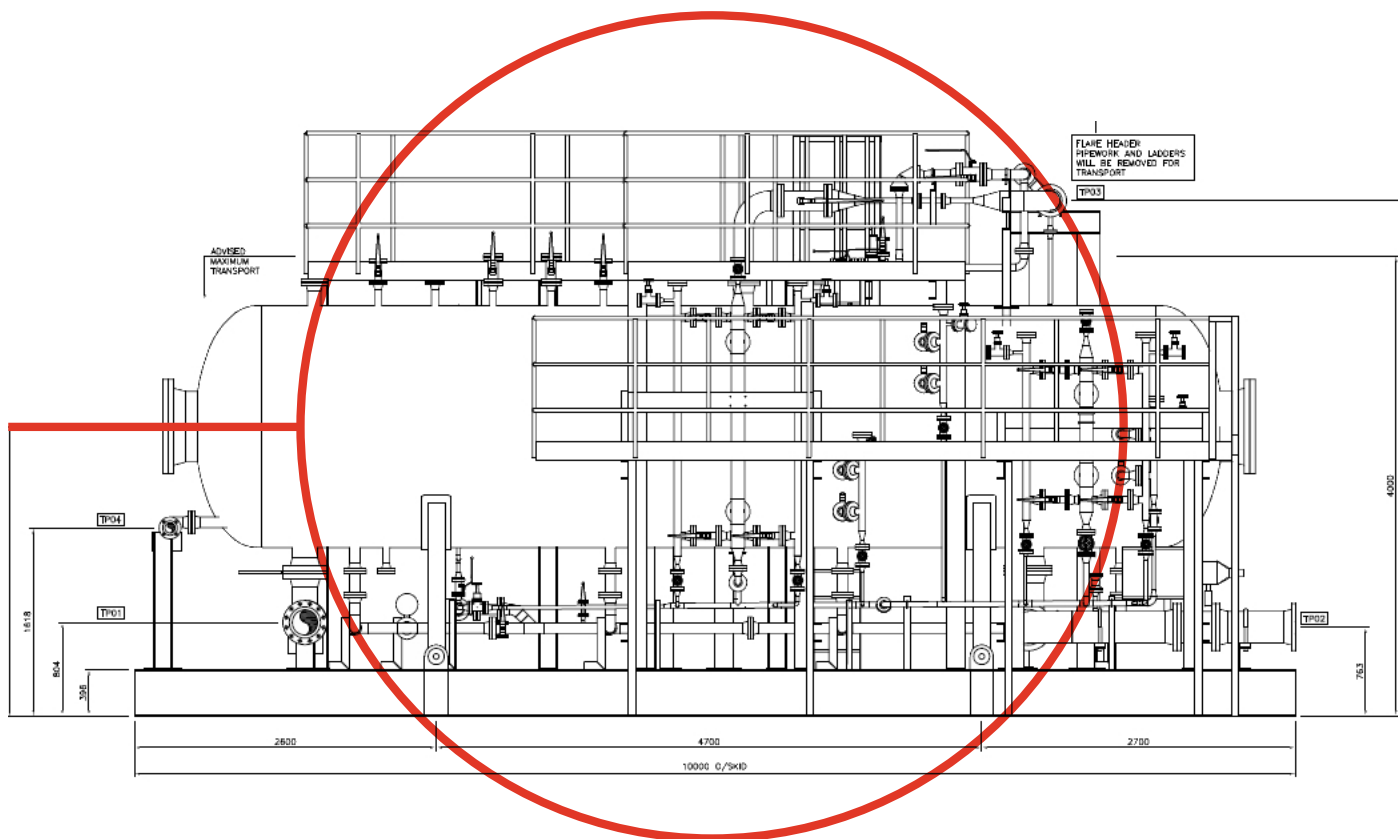
Year: 2011

Application

This contract was placed by IMS in Russia, a member of the IMS Group partnership, for a Produced Water Treatment package to be installed at the Vankor Oil Field operated by Rosneft in Russia.

- Make-Up Water Skid
- Produced Water Desander & Deoiler Skid
- Vertical Desanding Vessel and Accumulator, Sand Removal System, Deoiler Vessel
- Produced Water IGF Vessel Skid – Induced Gas Flotation (IGF) Vessel
- Produced Water Oil Recovery Pump Skid – Progressive Cavity Pumps
- PLC based Thyristor Control Panel





Description

The Make-Up Water Package is a two stage process that is designed to treat aquifer water removing solids and excess gas. The gas is both free gas generated by an upstream pressure reduction, and evolved gas from solution. The first stage of the process is a simple gas eliminator vessel to remove the bulk of the free gas at the package inlet, and most importantly to remove slugs of gas that would make it difficult for the desanding hydrocyclones to operate efficiently. The second stage is a degassing vessel that will remove this evolved gas and provide some static head for the downstream pumps. The gas eliminator, desander and degasser are operated



as a single unit. The discharged water from the degasser is designed to have less than 20mg/l of suspended solids.

Cyclone Theory

As the water enters a desanding hydrocyclone liner, the tangential inlet creates a spin within the short cylindrical inlet section. The cylindrical section helps to establish the spin prior to the fluid passing downward into the conical section where it is accelerated as it moves towards the apex. The process of separation within the liner is essentially gravity separation of the two phases liquid and solids (oil and water can be considered in the same phase as they are both significantly less dense than the sand).

Gravity separation by conventional means requires high residence times and therefore very large vessels in order to ensure that sand is removed to the specified particle cut size. The process of gravity separation within a vessel is defined by Stokes' Law, which relates the terminal settling velocity of a particular particle size to the drag created by the surrounding fluid and the density difference. Therefore the length of time

required to separate the solid can be determined and also its probability of separation may be estimated.

