

Treatment of Oil Drilling Platform Wastewater

An oil and gas waste management company had been awarded a contract to manage the onshore treatment and disposal of wastewater from a number of drilling platforms. The wastewater included acetic acid arising from platform cleaning and well stimulation, which was a principal cause of the COD (chemical oxygen demand) of the water. Acetic acid cannot be removed by oxidation or chemical precipitation. However, the company did not have the space to install conventional wastewater treatment plant, including a biological treatment with an activated sludge bed to remove the acetic acid, which it would have needed to meet the requirements of its discharge permit.

Global Advantech supplied a two-stage electrocoagulation system to remove solids, heavy metal and emulsified/dissolved hydrocarbons from the wastewater, dissolved gas flotation/sedimentation tanks after each electrocoagulation cell. A membrane filtration system was included to remove the acetic acid from the water after electrocoagulation in order to meet discharge limits.

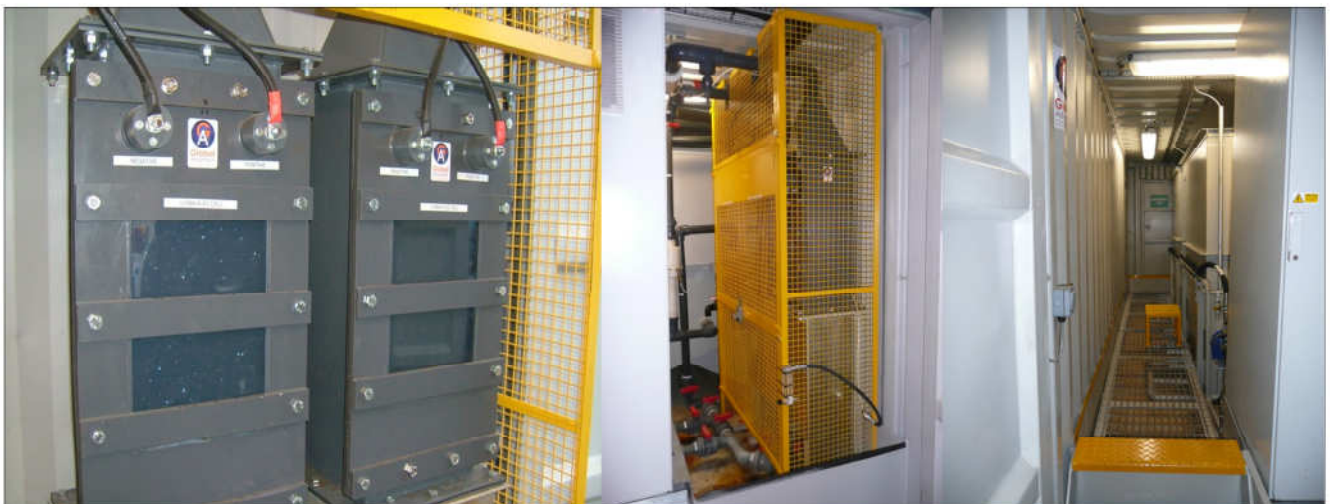
The wastewater contained a high level of suspended solids, which were completely removed, as shown by the samples taken at, before and after each electrocoagulation cell (photograph above right, 0 = original water and 4 = final result). The COD was reduced to 5,200 mg/Kg by electrocoagulation and analysis confirmed that 95% of this was caused by acetic acid. After the processing through the membrane filtration system, the COD was reduced to 1,250 mg/Kg and well under the COD limit for discharge.



Global Advantech's electrocoagulation systems contain a number of innovative design features and benefits for effective and continuous operation:

- Cells use optimised low voltage, high current electrochemistry.
- The cells have a hydrodynamic design, which ensures that flow is through the whole cell volume and electrodes are evenly consumed.
- Cells use upward water flow to sweep out all hydrogen and oxygen bubbles produced during the process and air is injected after the cells to enhance flocculation/sedimentation.
- Systems are PLC controlled: programmed to prevent electrode passivation.
- Instrumentation options include computerised electrode-wear monitoring and remote telemetry.
- Advanced electrochemical oxidation cells available to mineralise many soluble organic compounds to carbon dioxide water and simple salts, and oxidise sulphides and ammoniacal compounds).

For more information on electrocoagulation, please see Technical Data Sheet TDS801.



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