

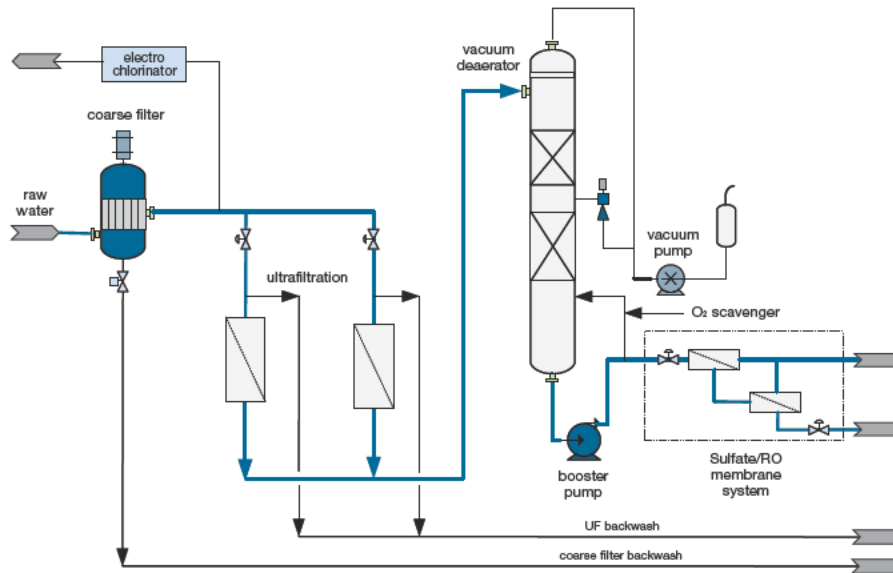
SEAWATER TREATMENT AND INJECTION SYSTEMS



Together creating pure
oil, gas and water.

ProSep offers customized water treatment equipment used in Water Injection Systems. Water injection or Water Flood refers to a method whereby water is injected into the oil reservoir, usually to increase or maintain reservoir pressure. In addition to maintaining reservoir pressure, injected water essentially sweeps or displaces oil from the reservoir, and pushes it toward the production well consequently stimulating oil recovery.

SEAWATER TREATMENT SYSTEM



TECHNOLOGY

ProSep offers customized skid packaged solutions for offshore or onshore applications. In seawater applications, raw seawater is drawn from a certain depth, typically about 100 ft, through seawater lift pumps. The raw seawater is then chlorinated using an electrochlorinator to prevent biological growth in the downstream equipment. The electrochlorinator generates sodium hypochlorite by electrolysis of seawater.

Coarse Strainers are located downstream of the seawater lift pumps. Used in seawater injection system applications, they remove large oceanic contaminants such as silt, algae and crustaceans and are typically rated for 80-100 microns. However, other micron ratings can be used depending on customer requirements. Coarse Strainers are self-cleaning, allowing uninterrupted continuous flow at full capacity during backwash.

Filtered seawater from the Coarse Strainers is then routed to either the Multimedia filters or Ultrafiltration (UF) membranes depending on the treatment process selected. ProSep offers vertical multimedia filter vessels which provide high efficiency (98%) removal of particulates greater than 2-5 microns. The ultrafiltration process provides higher quality water than multimedia filters. It is lighter and occupies less plot area

than multimedia filters making it ideal for offshore floating platforms where plot area is a premium and significant weight savings can be realized. ProSep will work with different UF membrane manufacturers to meet customer requirements.

Treated water will have to be deaerated before it can be injected. Deoxygenation or deaeration removes dissolved oxygen to control corrosion and/or aerobic bacteria activity. ProSep manufactures conventional deaeration equipment such as vacuum stripping or fuel gas stripping packed towers. Water from the deaerator tower can undergo further filtration or polishing steps by using cartridge filters to provide absolute filtration performance prior to being injected.

In addition, ProSep has in-house expertise to design and deliver a complete Seawater Injection System incorporating Sulfate Removal Membranes for reservoirs with strong presence of Barium and Strontium. Removal of Sulfate is required to control scaling in production wells. Typical specification for injected water is less than 40 ppm. ProSep can also tailor the membrane system design to a specific design water flood requiring overall low salinity and not just reduction of sulfate.

BENEFITS

ProSep provides process, mechanical, vessel, instrumentation and electrical designs for fabrication. The detailed design of the equipment considers performance, operability, reliability and safety based on experience and industry codes. ProSep designs and builds water injection systems to customer or ProSep specifications.

- Compact skid packaged design
- Easy operation and minimal maintenance
- Reduced on-site time and costs
- Ongoing support throughout the life of the equipment

APPLICATIONS

ProSep's Water Injection Systems can be deployed for any seawater, river, lake or aquifer water. Offshore Oil & Gas Platforms (Fixed Platforms, FPSO, TLPs) can benefit from ProSep's compact designs for water injection for enhanced oil recovery applications.

CONTROL SYSTEM DESIGN AND COMMISSIONING

ProSep can offer customized control systems depending on customer requirements.

The Company also offers full commissioning support and start up assistance to ensure that equipment is operated efficiently, safely and reliably.

REFERENCES

Available upon request

FOR MORE INFORMATION

Contact your nearest ProSep office.
www.prosep.com



About ProSep



ProSep is a technology-based process solutions provider for the upstream oil and gas industry.

The Company designs, develops, manufactures and commercializes technologies to separate oil, gas and water generated by oil and gas production.

ProSep's innovative offerings have been awarded three Spotlight on New Technology Awards from the annual Offshore Technology Conference in Houston in 2005 and onwards, comprising the proprietary technologies ProScav, C-Tour and ProSalt.

CANADA
+1 514 522 5550

KOREA
+82 2 521 3668

MALAYSIA
+603 2715 6680

MIDDLE EAST
+973 36 460142

NORWAY
+47 55 52 94 00

UNITED STATES
+1 281 504 2040