

Industrial RO Systems For The Energy Industry - AMPAC USA

Summary:

The energy industry has been seeing positive growth in the past few years and is set to grow in the coming years. Seawater desalination is a very important part of the energy industry as a popular option for sustainable electricity generation. Reverse osmosis has helped innovate the operation of seawater desalination. However, in the past 10 to 15 years of such plants coming up on the coasts of Israel, Australia, and the US, only a few reports have investigated its potential threat to the marine ecosystem. The flora and fauna living below the sea level, especially at close proximity to the plants are the most susceptible to brine poisoning, the rejected concentrated water. This article by AMPAC USA explores the aspects of the energy industry that require water and how Industrial RO systems assist in better waste disposal for the facility.

Description:

The energy industry is growing at a very fast rate and includes both renewable and non-renewable sources. The global energy demand spiked in 2018 by 2.3%. In the U.S., generated electricity in 2014 came from coal, natural gas, nuclear, hydropower and non-hydro renewables with remaining coming from the collection of smaller sources. All of the operations at these plants require a good amount of water to keep running smoothly. The process of [reverse osmosis](#) in the energy industry is being extensively used today for a number of reasons. It is used to treat boiler makeup water, cooling towers makeup water, and perform condensate polishing for re-use. This is because the available water has unwanted contaminants which affect the performance of the machinery in use.

“Additionally, it offers the choice of treating the wastewater created in the process for meeting the standards of waste disposal,” says Sammy Farag, CEO of AMPAC USA. The company has been working in the water treatment industry for 30 years and has developed expertise in reverse osmosis and seawater desalination. *“Use of RO in treatment has made the impossible task of unlimited industrial feed supply possible. It was only a matter of time before it reaches one of the biggest industries in the world.”*

But the use of water or its treatment in the energy industry is not new.

Water For The Industry

Like every other facility, water is needed to run the day to day operations of a manufacturing facility and in this case, energy. Every power plant requires different amounts of water and this is decided by the needs of its cooling system. Usually, it is used for the purposes of generating electricity or cooling off the equipment in the plant. Majorly, all the conventional plants use something called a once-through system or a cooling tower.

The once-through system pulls water directly from natural sources like rivers, lakes or streams, runs through the facility and helps the plant generate electricity. After this, it is released back into the environment. On the opposite, a tower recirculates the water many times through the facility which may end up evaporating in the process, as a result, it ends up using 30-70% more water than a once-through setup.

Concerns Regarding Wastewater Generation

Waste generated by different power plants contains different constituents. One of the major sources of industrial water waste is coal plants that run on fossil fuels. The waste discharge from these plants has significant levels of lead, mercury, and chromium which are very harmful in concentrated amounts, especially in a mixture. If the energy facility runs on nuclear power, the waste is even more harmful as it remains radioactive and hence a threat to the health for a long time after its disposal.

Farag adds, *“The one major concern that gives many scientists sleepless nights is whether wastewater disposal has a negative impact on the environment. When the reject of an industry as big as energy is released into the [oceans](#) or lakes, rivers and streams, it is a concentrated form of input feed supply. This implies increased pollution of water bodies with chromium, lead, arsenic, selenium, and mercury.”*

This can result in a drastic impact on flora, fauna and human health if at all the pollutants come into contact with the water supply system. This is where treatment systems come into play and Farag explains how.

Water Treatment

The energy industry generates a massive amount of wastewater which in no way can be released into the environment unsupervised. Treatment systems are a great solution to all of the challenges the facility faces with respect to water. [Industrial RO](#) is designed exclusively for the specific purposes of the industry. In this case, it can be used for two major purposes.

- Feedwater treatment involves treating the incoming feed water for chemicals, TDS, suspended solids, any organic and inorganic matter that can be a hindrance in the way of smooth functioning.
- Wastewater treatment involves treating the water for all the intense metal composition that has lead, mercury, arsenic, selenium, and chromium. This is majorly for meeting the local and state waste disposal standards.

“Both these systems have to be heavy-weight equipment for optimum results. The machinery needs to be easy to use, should require minimum supervision and should work smoothly for a longer period of time without frequent maintenance or breakdowns,” said Farag. *“The need for this machinery is to make the job of the facility easier which is why they have more features than most of the Commercial RO systems.”*

The features Farag says that are most important to the working of such a system are:

1. A PLC controller with every information on the water present. TDS, salinity, temperature. The controller also helps in monitoring the various aspects like slow and high-pressure switches, tank levels and pre-treatment equipment. Other functions include relay outputs for the high-pressure pump, inlet valve, optional relays for remote alarm, membrane flush process, etc.
2. Multimedia Carbon Pre-Filter made from the best materials and is able to handle the harshest of contaminants. It is responsible for chlorine removal, pH adjustment and elimination of excess bacteria. Spin Down Pre-Filter for corrosion resistance and particulate removal. Sediment filter assists in higher flow rates by dirt, sand and sediment removal at high capacity.
3. On-demand feed supply pump supplies the system seawater stored in the settling tank in the required pressure and flow. It is, therefore, necessary for it to be highly reliable and durable. High-pressure plunger pumps are needed to boost pressure up to 1200 psi for better desalination.
4. Other important parts of these systems are the membrane elements, pH neutralizer, ceramic post-filter, and UV filter is optional depending on the purpose of the industrial RO.

“These specifications are the system requirements but additionally, there are many other features that make it a sound industrial RO,” said Farag.

Noise reduction, monitors for stainless steel glycerine filled pressure gauges for sensing changes in pressure, flow, salinity, temperature, etc., safety features especially explosion-proof make it an all-round [good system to employ](#) at a power plant.

About The Author:

[AMPAC USA](#) is a manufacturer of water treatment systems used around the globe for quality drinking water. The company has an experience of over 30 years, uses the latest technology to provide a standard, reliable products and works with experts to give the best possible service.