



## Coal Fired Power Plant, India

**Q-SEP Model:** Q-SEP® 6008

**Total Q-SEP Membranes:** 56 (28 x 2 trains)

**Permeate Flow:** 100m<sup>3</sup>/hr x 2

**Application:** Cooling Tower Blowdown wastewater recycle in a Power plant

### Project Background

The client, a coal fired power plant located in a center-east state of India, had a requirement of a water treatment system to recycle the plant's cooling tower blowdown water containing high colloidal silica and turbidity. Ultrafiltration was selected as the pretreatment of choice to the Reverse Osmosis (RO) plant. UF was required in the tertiary treatment to provide consistent product water with low silt density index (SDI) to safeguard the downstream RO unit from colloidal fouling.

### QUA Solution

The OEM chose QUA's Q-SEP® hollow fiber UF membranes as the ultrafiltration solution for the project due to the higher design flux rate. With a higher flux rate of 65 l/m<sup>2</sup>/h, QUA was able to

offer lesser number of modules compared to other manufacturers, saving on capex for the client.

QUA provided exceptional pre-sales engineering support to the integrated system supplier in designing the UF system, which ensured efficient and successful installation at site and subsequent commissioning and performance. Q-SEP modules successfully met the plant's requirements because of their low fouling characteristics, uniform pore size distribution and large surface area which provided high operating efficiency and reliable operation.

The Q-SEP system comprises of two trains of 28 modules each. The system is designed to operate in the dead-end mode.

## Results

The UF system has been operational since February 2018. It has been performing uninterrupted and satisfactorily and is able to provide a consistent permeate output of 100m<sup>3</sup>/hr in each train. The Trans-membrane pressure (TMP) has been consistently below 1 bar. Chemical Enhanced Backwash (CEB) is done once a day. The output SDI is consistently below 3 since startup.

The client has gone on record to recognize Q-SEP performance and has issued a performance certificate to that effect.

## UF Permeate Water Parameters

Feed Flow: 110 m<sup>3</sup>/hr/stream  
Net Product Flow: 100m<sup>3</sup>/hr/stream  
TMP: 0.4 kg/cm<sup>2</sup>  
Product water turbidity: 0.1-0.2 NTU  
Product water SDI<sub>15</sub> : <3

## About QUA

QUA is an innovator of advanced membrane technologies that manufactures and provides filtration products to address the most demanding water challenges.

### FEDI® Electrodeionization

Q-SEP® hollow fiber UF modules contain membranes manufactured with QUA's innovative patented "Cloud Point Precipitation" method. This process ensures a high pore density along the length of the fiber and uniform pore size distribution in the membrane; 90% of the pores are of the size 0.02 micron. Q-SEP modules deliver superior performance characteristics and product water quality that surpass the quality from conventional UF modules. The uniform pore size distribution allows the membrane to produce

water with a low silt density index (SDI), which leads to less frequent and easier cleaning of downstream RO membranes. In addition, the Q-SEP membranes provide an excellent rejection of bacteria and viruses.

Q-SEP UF membranes are made of modified hydrophilic polyether sulfone (PES) material that offers high fiber strength and excellent low fouling characteristics, resulting in higher membrane productivity. These hollow fiber membranes operate under a low trans-membrane pressure in an inside-out flow configuration for superior performance. Applications of Q-SEP UF include pretreatment to RO systems (brackish and seawater applications), purification of surface and well water for potable applications, filtration of industrial water, and wastewater recycle and reuse.