

## Ion Exchange and Reverse Osmosis

N.V. Electriciteits-Produktie­maatschappij Zuid-Nederland EPZ, Borssele

### Results

Combination of ion exchange and reverse osmosis from Ovivo Holland led to such an improved boiler feed water quality that the condensate polishing plant does not need replacement.

- Constant demin water quality of < 0,08 µS/cm.
- Constant low silica levels and very low TOC values due to specific design.
- Complete automatic operation incl. regeneration and C.I.P.
- Secure plant operation with remote monitoring and integrated data trending.
- BRL certified chemical storage facility.
- High quality, low maintenance and service intervals led to high customer satisfaction.



### Challenge

The water treatment plant of power company N.V. Electriciteits-Produktie­maatschappij Zuid-Nederland EPZ was reaching a respectable age (approx. 35 years) and had to be replaced.

Main issues with the existing water treatment plant were hydraulic capacity, conductivity and TOC levels which could no longer reach the improved requirements for operating high pressure steam boilers.

The goal to keep the coal and bio-mass fired energy production facility open until 2021 and upgrade the boiler feed water quality to the new standards led to an investigation of possibilities.

The technical ideas and operational philosophies of Ovivo matched those of EPZ which led to the order. Ovivo has designed, engineered and executed the complete plant as turn-key.

### Solutions

Based on the many years of experience in the field of power stations and similar high grade water customers the project was executed with the following process steps :

- Separate bed cation (SAC) and anion exchangers (WBA and SBA) with integrated CO2 degassifier
- Reverse osmosis (high retention elements) with integrated fully automatic C.I.P. unit
- Mixed bed exchanger (UP quality resin)
- Regeneration station with chemical storage for acid and caustic (BRL certified)
- Neutralization unit for regenerants
- Control unit with PLC and advanced HMI with trending

In total the plant supplies nominal 25 m3/h of high grade boiler feed water. Due to the source of the feed water (surface water from Petrus plaat) and its fouling potential, the RO unit is equipped with an integrated, fully automatic, CIP unit.

## Ion Exchange and Reverse Osmosis

N.V. Electriciteits-Produktie­maatschappij Zuid-Nederland EPZ, Borssele



### Results

The design of the plant led to the following results :

- Fully automatic operation of the complete plant (including regeneration of the ion exchangers and C.I.P. of the RO unit)
- Constant product water conductivity of  $< 0,08 \mu\text{S}/\text{cm}$
- Actual TOC value of approx. 5-10 ppb (guaranteed value  $< 50$  ppb with 3,3 ppm TOC at inlet) due to special warm water regeneration steps, high retention RO elements and UP quality polishing resin
- $\text{SiO}_2$  levels  $< 10$  ppb
- Due to historical experience fouling of the RO elements was expected but the cleaning interval is very low (approx. once a year)
- Due to the high feed water quality at the inlet of the high pressure boilers, the upstream condensate polishing (approx. same age as original water treatment plant) does not need replacement while the regeneration intervals are lengthened leading to (unpredicted but welcome) cost savings.
- The complete plant is located in a separate building on the premises of EPZ which was a result of close cooperation between the two parties. Important items like safe chemical handling etc. were part of the risk analysis and HAZOP meetings.
- The integrated data trending feature in the advanced HMI supplies all data required for remote monitoring and reporting back to the customer.
- The proper and effortless operation in combination with remote service results in a highly satisfied customer who therefore also saves costs in operation and maintenance.



[ovivowater.com](http://ovivowater.com)