

CACE measurement OPEX comparison: resin replacement vs. automatic EDI resin regeneration

CACE (Conductivity After Cation Exchange or also Cation or Acid Conductivity) online analysis is the most required parameter to monitor and control the quality of the water steam cycle of any thermal power plant and process steam in industrial plants.

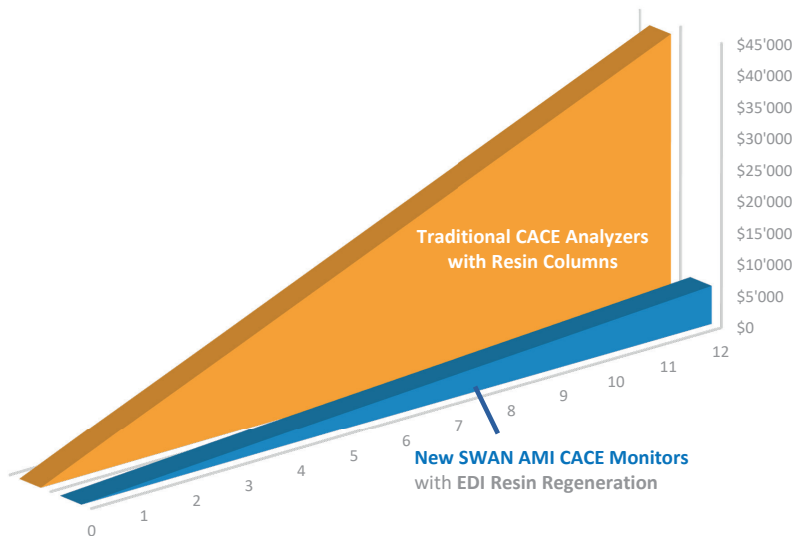
Typical conductivity measurement points in water steam cycles per IAPWS include Condensate, Feedwater, Boiler, Steam and Make-up water.

It has been standard practice to use resin-based cation exchangers for CACE analysis, which however are consumed depending on sample flow, sample pH and resin column design. Thus, frequent and regular human manipulation is required. This is against the philosophy of online analytics which are intended to operate as independently as possible.

Depending on plant setup and arrangement, in a modern Combined Cycle Power Plant (CCPP) with 2 blocks in 2-2-1 configuration (2 gas turbines feeding 2 HRSG units supplying one common steam turbine) a total of around 24 CACE analyzers are required, not considering auxiliary equipment.

In CCPPs on AVT with a pH of around 9.7 after 8 weeks at a sample flow rate of 8 liters per hour the typical resin volume of 1 liter per analyzer is consumed. However, this is a theoretical value. Practice shows that due to start-up or load-changing run of plants, impurities in the cycle cause faster resin consumption, so that 4-6 weeks appear to be a more realistic consumption rate. Nuclear power plants running on a higher pH have an increased consumption of resin and need more frequent replacement or regeneration.

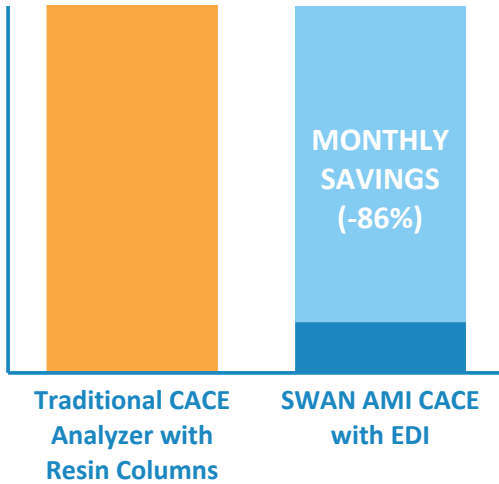
Case Study: CACE Analyzer OPEX Comparison per Year
(2x 2-2-1 CCPP: 24 Analyzers, pH 9.7, Flow Rate: 8l/h)



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Save Money **Every Month**
(pH 9.7, flow rate: 8l/h)



Annual savings of more than USD 37'000 in above example plant strongly suggest considering CACE analyzer refurbishment.

Pay-back time by OPEX savings replacing conventional CACE analyzers is achieved within 1-2 years.

SWAN AMI CACE

Conductivity before and after cation exchange with an EDI module for automatic, continuous resin regeneration.

Save operating costs and measure more safely for constantly dependable data. Automatic calculation and display of alkalizing agent concentration and pH (VGB-directive 450L).

Continuous monitoring of

- Specific Conductivity
- Acid Conductivity
- pH Value or Alkalizing agent

No Costly Resin Columns Required:
No Resin Exchange. No Maintenance. No Chemicals.



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