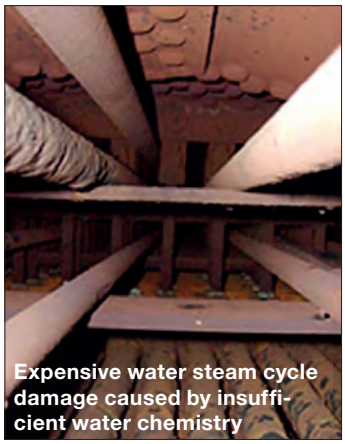
Online Sodium Monitoring in the Water Steam Cycle – An Essential Parameter for Condensate, Feedwater and Steam Quality Assurance

1. In the **Condensate Pump Discharge (CPD)** of water-cooled plants
2. At the **Condensate Polisher Outlet (CPO)**
3. In **Saturated Steam, Superheated** and **Reheated Steam**

1. Sodium Analyzer for Sensible and Fast Condenser Leakage Detection (at CPD)
Continuous monitoring of sodium is crucial in water cooled condenser plants (mandatory for seawater cooled plants), especially in systems with high risk of condenser leakages and no condensate polishing. Sodium measurement offers a very high sensitivity to detect leakage into the condenser. Already small leakages can have a critical impact and contaminate the pure water side of the water steam cycle. Subsequently, corrosion may occur.

2. Sodium Analyzer to Monitor the Condensate Polisher (CP)
Measuring sodium at the CP outlet is more sensitive than conductivity to cation breakthrough and will alert the operator earlier about the need for resin regeneration, respectively for eventual undesired sodium leakage. In plants with an air-cooled condenser (ACC) the CP often is operated in the so-called ammonium cycle. The risk of sodium slippage is very high with this type of operation. Consequently, supplemental sodium monitoring at the CP outlet can already detect smallest traces and give an early warning to avoid dangerous contamination of feedwater and steam (spray attemperation!).

3. Sodium Analyzer to Detect Carryover and Contaminants in Steam
Monitoring of sodium (in combination with CACE) in the saturated, superheated and reheated steam provides information about contaminants in steam, e.g. caused by mechanical carryover from the boiler and contaminants of spray-water into the steam (steam attemperator). Plants with drum boilers always have a risk of mechanical carry over. Hence, routine checks for mechanical carry over by means of online measurement is highly recommended.



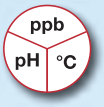
Expensive water steam cycle damage caused by insufficient water chemistry

See also IAPWS TGD1-08: http://iapws.org/techguide/Carryover.pdf

For more information on recommended instrumentation in water steam cycles: IAPWS TGD2-09(2015): http://www.iapws.org/techguide/Instrumentation-2015.pdf

Common Features

Easy two-/three- point calibration with direct standard injection and storage of calibration history



Complete display of current measured values, sample conditions and alarm status

Clear flow chamber block: flow monitoring and easy electrode installation/service

AMI Sodium A

AMI Sodium P

AMI Soditrace

Swan Online Sodium Analyzers have a simple automatic temperature compensation and perform a two-point calibration with storage of their calibration history. Easy to use, integrated grab sample capability included.

AMI Sodium A: Analyzer for the continuous determination of dissolved sodium for samples with pH ≥ 2. pH controlled alkalization reagent addition for diisopropylamine with maintenance-free air pump.

AMI Sodium P: Continuous measurement of dissolved sodium for samples with pH ≥ 7. Reliable alkalization reagent addition system for diisopropylamine or ammonia with continuous pH monitoring.

AMI Soditrace: Monitoring of sodium trace amounts with fully automatic three-point known addition calibration in ppb range. Programmable automatic regeneration of the sodium electrode and pH controlled alkalization reagent addition for diisopropylamine with maintenance-free air pump.

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