

**Abstracts****Sodium Monitoring in the Water and Steam Cycle of Power Plants**

Philippe Dudouit, Pierre Guillou, and Eva L'Hostis

Today sodium concentration has become one of the most important indexes for quality control of water and steam at power plants; however, measurement of this parameter can be difficult in practice. The use of ion selective electrodes means that analyzers are sensitive to pH shifts, and constant exposure to very low concentrations of sodium ions in ultrapure water conditions can lead to electrode desensitization. In addition, there is a need to address drift through regular calibration. This paper discusses the technical challenges in low level sodium analysis and the required features for a practical and accurate analyzer to provide trouble free, sub  $\mu\text{g} \cdot \text{kg}^{-1}$  (sub ppb) measurement.

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**Advances in Ion Chromatography for Power Plant Operations**

Beverly J. Newton and Detlef Jensen

Ion chromatography is used in the power industry to monitor and minimize corrosive ions in the steam generator, turbines, steam and feedwater piping, and protect against cooling water impurity ingress. This paper includes a review of the recent advances in the science of ion chromatography which are aimed at improving trace analysis of corrosive ions in power plant waters and chemicals. An overview of hardware and column advances for these applications is presented. Included are details on lowering detection limits through the use of automated eluent generation and specialty columns. The emphasis is on advances in the science which will help extend the operating life of steam generators, secondary systems and turbines. Examples of the use of ion chromatography for troubleshooting corrosion problems in power plants are given.

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**Cation Conductivity: Facts and Fiction**

Heini Maurer

Cation exchangers are of paramount importance to reliable conductivity readings. They come in all shapes and sizes and each and every type has its advocates. The purpose of the paper is to separate facts from fiction and shed light on such issues as rinse down, temperature effects and response time.

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**Dutch Approach to *Legionella* Control in Cooling Water Systems: History and Perspectives**

Frank I. H. M. Oesterholt, Jo Savelkoul, Antoine I. van Hoorn, Lambèr L. M. J. Paping, and Johan W. G. van Mourik

Cooling systems with recirculating open cooling towers represent a considerable *Legionella* risk. The Dutch Policy Rule 4.87 forces employers to carry out a risk assessment and establish a control plan for their cooling towers. This legislation only gives general descriptions and no standards. However, to provide employers with more detailed information on how to control and maintain their system, the Information Report AI-32 was written as a Dutch Code of Practice. The biggest problem for cooling tower owners is obtaining accurate data on *Legionella* concentrations in their cooling systems. The results of different methods in use to quantify *Legionella* differ to such an extent that it is very difficult to make a realistic estimate of the risk of *Legionella* infection to employees and the environment, and to adequately decide on corrective actions to be taken. More and more industries and laboratories are affected by the same lack of a reproducible analytical technique. It has become clear that the existing methods were developed primarily for relatively clean water systems with a limited lifetime, like potable waters, and not for industrial cooling systems. Especially for these industrial waters, which are re-used many times, the same analytical method cannot consistently deliver the necessary degree of reproducibility. Two cases at Corus and Dow in their industrial water systems demonstrate that there are differences in accuracy between laboratories using the same analytical method as well as between analytical methods themselves. Future work should result primarily in a new analytical method which is faster, more reliable and better reproducible compared to the current methods. Secondly there is a need for a protocol on the method for obtaining a representative sample from a complex cooling system.

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**Some Questions and Answers on All-Volatile Treatment**

Albert Bursik

PowerPlant Chemistry has received a multitude of questions regarding currently used feedwater and boiler water treatments. This contribution addresses many of the inquiries about all-volatile treatment, giving general information on the subject and providing references where the questioners and readers of this paper can find more detailed information on the topics discussed.

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**Online Coal Analyzers Bring Benefits to the Utility Industry****Richard Woodward**

Online coal analyzers have been in commercial use for more than two decades now, with coal producers accounting for most of the units purchased. In the past three years or so, coal-fired power plants have shown an increasing share of the analyzers bought. This article explains the most common applications of analyzers at power plants, ranging from boiler optimization to compliance with emission regulations. The article also provides a brief overview of different analyzer types, their principles of operation, and typical performance achieved.

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