

**Abstracts****Condenser Tube Fouling and Failures: Cause and Mitigation**

Andrew G. Howell and George E. Saxon, Jr.

The two most common condenser tube problems faced by chemists are internal tube fouling and tube failure. Fouling can have a major impact on power station generating efficiency and/or capacity, and tube leaks can seriously impact unit availability and reliability. Fundamental understanding of the root cause(s) of these issues and their mitigation is essential to resolving these problems and/or preventing their occurrence.

PowerPlant Chemistry 2005, 7 (12)

**Process Monitoring: What Really Matters**

Ruedi Germann

This paper focuses on an increasingly important topic: problems with bidding procedures for process monitoring instrumentation. The recent calls for bids are exclusively focussed on prices and do not take into account the kind of application and the specific requirements with respect to instrument maintenance and quality assurance. As a rule, the cheapest instrument selected does not in the majority of cases represent the best solution, in particular for cycle chemistry monitoring in power plants.

PowerPlant Chemistry 2005, 7 (12)

**Measurement of Organics in Power Plant Makeup Water Treatment**

David M. Gray

Most efforts at producing pure water have focused on removing minerals, with processes that do not necessarily remove organic compounds. There is increasing awareness of the problems that organics can cause in the power plant cycle and this can drive changes in water treatment methods. A key to confirming and trouble-shooting organics removal processes is a reliable TOC (total organic carbon) measurement. Presented here is a particularly applicable and economical instrumentation approach for rapidly detecting organic contamination in various stages of pure water treatment systems. The instrument platform uses a separate TOC sensor and transmitter which enable simultaneous measurements of conductivity, pH, dissolved oxygen and flowrate, in addition to TOC, on the same transmitter.

PowerPlant Chemistry 2005, 7 (12)

**Operational Experience with Organics in Industrial Steam Generation**

Jo Savelkoul and Roy van Lier

Radiolytic hydrogen generation on gamma irradiation of turbid solutions containing metal turbidities such as titanium, nickel, iron, chromium, copper, indium, and aluminium was studied. It is suggested that the chemical reactivity of the metal in the turbid solution with radicals produced by radiolysis of water interferes with the recombination reactions which destroy hydrogen and hydrogen peroxide, thus leading to higher yield of hydrogen. The rate of generation of hydrogen and the radiolytic yield of hydrogen is related to the reactivity of the metal ion/hydroxylated species with the free radicals.

PowerPlant Chemistry 2005, 7 (12)

**Ion Exchange Resin Fouling by Organic Amines in Secondary Systems at U.S. Nuclear Power Plants**

Dennis P. Raught, Gary L. Foutch, and Allen Apblett

Organic amines added to power plant feedwater to control iron concentrations have an impact on ion exchange resin performance. Several theories attempt to explain the cause. One such theory is that cation resin reacts with the amine, cleaving fragments, which then deposit on the anion resin. The deposition blocks pores or permanently utilizes exchange capacity on the anion resin, resulting in reduced exchange of impurities. Nuclear industry operators have recognized this phenomenon and are working with researchers to apply laboratory experience to improving plant performance.

PowerPlant Chemistry 2005, 7 (12)

**Studies on the Issue of Fine Dust Based on the Example of Grosskraftwerk Mannheim AG**

Matthias Meierer

Recently, the issue of fine dust has come to the fore in the public interest because of repeated incidents where the maximum permissible levels for ambient pollution (immissions) were violated significantly. A recent EU directive has defined new limit values, which have already been integrated into German law through an ordinance under the Federal Immission Control Act. The new limit values came into effect in January 2005. This report provides some background information regarding the sources and mechanisms of fine dust formation, as well as the transfer and the separation of fine dust. Specific measuring and analytical methods are capable of identifying the concentration of both fine dust emissions and immissions (ambient pollution levels).

Over the past decades, effective technical measures have helped to significantly reduce dust emissions from power plants and industrial facilities in Germany. The current situation of ambient pollution in Germany is characterized by great regional differences. In particular, traffic has a share in limit value violations. The report describes other types of emission sources as well. The share of fine dust pollution specifically attributable to fossil-fired power plants is very low in Germany. This has been confirmed for the local pollution scenario in the Mannheim area by an examination of the dust ratios emitted from the Grosskraftwerk Mannheim AG plant using propagation calculations.

PowerPlant Chemistry 2005, 7 (12)