

ABSTRACTS

Achieving Zero Blowdown for Cooling Towers

Sam R. Owens and Rick H. Maxey

A new chemistry approach provides water savings in hard, alkaline cooling waters. Hardness and silica are removed as a semi-viscous fluid. This economical treatment program reclaims over 95 % of open circulation cooling tower water blowdown. Significantly reduced make-up and wastewater treatment costs often make this the preferred treatment program.

PowerPlant Chemistry 2008, 10(4)

Microbiological Problems in Turbine Oils – Detection On-Site, Anti-microbial Strategies

Edward C. Hill

Some microbes can gain access to wet turbine oil systems, and if they find the chemical and physical environment conducive, they will proliferate wherever there is free water. This infected water can be considered as the factory which produces these slimy, sticky, corrosive organisms; their surfactancy allows them to spread into the oil causing operational problems and to colonize other niches. Many will die when they are in dry or hot oil, but they still have the ability to cause fouling. A variety of anti-microbial strategies can be deployed to minimize the risk of operational problems. Considerable care must be used when implementing them, particularly the use of biocides. It is much easier to kill a few microbes than many microbes, and it is sensible to do this before operational problems occur. On-site microbiological test kits are now being used by power station chemists to monitor turbine oils and detect early growth, and to check the efficacy of any remedial measures implemented.

PowerPlant Chemistry 2008, 10(4)

Basics of Integrated Steam Cycle Metals Sampling

Andrew Howell

Corrosion and transport of metals in the high-purity steam cycles of power plants can cause very costly problems with station components. Metals sampling in these systems provides useful data for evaluating corrosion and corrosion product transport. Collection of both particulate and dissolved metals can inform the plant about the performance of chemistry treatment and monitoring programs, and the effect of program changes on corrosion and metals transport. One mode of sampling is to collect metals from a known volume of water over an extended period of time (integrated sampling), and then analyze the result to determine what is essentially an average metals transport value over that time frame. Consistent procedures and processes carried out over an extended period result in data that reasonably represents the long-term metals corrosion and transport characteristics of plant systems. This paper describes some of the basic factors involved in integrated metals sampling, and demonstrates the value of the technique with actual plant data for several situations.

PowerPlant Chemistry 2008, 10(4)

The Development of a Standard for a Power Plant Analytical Chemistry Quality Management System

Daniel E. Meils and Joseph A. Mastroianni

This paper reports on the changes that have taken place since 2004 in the development of a Standard that defines those objectives that must be met in order for a power plant laboratory to demonstrate it operates a technically competent quality management system and is capable of producing technically competent results. The Standard for a Power Plant Analytical Chemistry Quality Management System was produced by the Power Plant Chemistry QA/QC Advisory Group and includes those practices required to meet the stated objectives.

PowerPlant Chemistry 2008, 10(4)

Treatment of Wastewaters from Coal-Fired Power Plants

William A. Shaw

The largest volume of water in most power plants is used for cooling. Pulverized coal (PC) plants use water for the steam cycle, wet flue gas desulfurization plant, ash transport, demineralizer plant regeneration, and boiler cleaning. As gasification technologies advance, new integrated gasification combined cycle (IGCC) plants will use water for quenching and gas scrubbing. In all coal-fired power plants the current and future trends are water conservation and minimizing the quantity of effluents discharged from the plant.

Using examples from operating plants, this paper describes the various types of effluent streams generated in both PC and IGCC plants, typical pollutants they contain, and the treatment technologies and systems most commonly used to meet regulated discharge limits. It also describes methods of minimizing water usage and discharge, including achieving zero liquid discharge.

PowerPlant Chemistry 2008, 10(4)

PPChem 101 – Fossil Cycle Chemistry**Lesson 3:****Cycle and Component Design, Materials, Operating Mode, and Plant Cycle Chemistry**

In this lesson, it is explained that plant cycle chemistry alone is not capable of ensuring high availability, reliability, and high-efficiency operation of a power or steam producing unit. The optimum engineering solutions may exclusively be elaborated in the close collaboration of engineers (designing the units and selecting the materials), operators (responsible for the actual operating mode) and chemists. Power plant design and operation is teamwork and the plant chemist (or any other person responsible for chemistry) has to be a good team player.

PowerPlant Chemistry 2008, 10(4)