

ABSTRACTS

The Impact of Feedwater and Condensate Return Excursions on Boiler System Component Failures

Mel J. Esmacher and Anthony Rossi

During boiler operation, the transport of contaminants in boiler feedwater or condensate return via hardness excursions or transport of metal oxides due to corrosion can cause fouling and subsequent tube failure due to under-deposit corrosion or overheating. Case histories are reviewed and suitable corrective actions discussed.

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Measurement of Biofilm Thickness: An Effective Legionella Risk Assessment Tool

Christophe Foret, Nicole Merlet, Guérolé Chaussec, Sergueï Martemianov, Bernard Tribollet, and Wolfgang Hater

The best way to prevent the risk of bacterial growth in water systems is to monitor and control the microorganisms (biofilm) attached to pipe walls. Three years of laboratory research led two Centre National de Recherche Scientifique (French National Center for Scientific Research) teams (UMR 6008 and UPR 15) to develop a tool designed to determine the average biofilm thickness. The average biofilm thickness measurements carried out on pilot plants fed with natural water were sufficiently accurate and sensitive to monitor the formation and development of biofilm in a water system and to determine the efficiency of the applied treatments. The implementation of appropriate treatments (type and dose of the treatment product) leads to a significant reduction in or even complete removal of the porous layer on the material surface. A reduction of the attached biomass, measured by the sensor, is connected to a decrease in the density of the bacterial attached to the material (viable flora in the plate count agar environment).

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Discussion

The PowerPlant Chemistry® editor has received an e-mail with comments and questions on the article
András Balogh and Zoltán Szabó: The Heller System: The Economical Substitute for Wet Cooling,
PowerPlant Chemistry **2009**, 10(11), 642–656

This e-mail and the reply from the first author are presented.

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Laboratory Evaluation of a Pd-based Catalyst for Deoxygenation of Stator Cooling Water

Shelton Dias and Andreas Rudolph

The water-cooled stator windings in turbine generators suffer from various forms of corrosion induced by the presence of dissolved oxygen. In the current study, various laboratory experiments were conducted to identify a suitable catalyst for the deoxygenation of stator cooling water (SCW) systems and to qualify the material to be used in a field trial in order to confirm its deoxygenation performance. The work focused on evaluating the Lanxess (formerly Bayer) Lewatit K 7333 catalyst with respect to its physical, chemical, and oxidation stability through accelerated ageing tests as well as its performance under extreme dissolved oxygen and hydrogen concentrations. Potential effects of any water extractable leachables from the catalyst on the materials of construction of the SCW system were also studied. The catalyst was effective in removing dissolved oxygen in the presence of dissolved hydrogen and should be able to meet or exceed the dissolved oxygen specifications ($\leq 20 \mu\text{g} \cdot \text{kg}^{-1}$) for SCW stations that operate under low-oxygen mode.

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Evaluating On-Line High Purity Water Oxidizing-Reducing Potential Analysis for Boiler Feedwater Quality

Vickie G. Olson

Conditioned boiler feedwater was analyzed with a unique flowing-junction oxidizing-reducing potential (ORP) analyzer in comparison with dissolved oxygen and other parameters. Two different fossil plant boiler chemistries were utilized in the evaluation. Correlations were drawn between ORP, dissolved oxygen, and hydrazine levels to determine the usefulness of this ORP analysis for corrosion control.

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2009's Scientific and Technical Contributions – Part 2

The abstracts of all articles published in this journal in the previous year appear usually in the January issue. This year, due to space limitations, we were only able to include half of the 2009 abstracts in January; the second part of this listing has been released only in this issue.

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PPChem 101 – Boiler and HRSG Tube Failures**Lesson 4: Hydrogen Damage**

R. Barry Dooley and Albert Bursik

University 101 courses are typically designed to help incoming first-year undergraduate students to adjust to the university, develop a better understanding of the college environment, and acquire essential academic success skills. Why are we offering a special *Boiler and HRSG Tube Failures PPChem 101*? The answer is simple, yet very conclusive:

- There is a lack of knowledge on the identification of tube failure mechanisms and for the implementation of adequate counteractions in many power plants, particularly at industrial power and steam generators.
- There is a lack of knowledge to prevent repeat tube failures.

The vast majority of BTF/HTF have been, and continue to be, repeat failures. It is hoped that the information about the failure mechanisms of BTF supplied in this course will help to put plant engineers and chemists on the right track. The major goal of this course is the avoidance of repeat BTF. This fourth lesson is focused on hydrogen damage of water-touched tubes in conventional boilers and in the high-pressure evaporators of heat recovery steam generators.

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