PowerPlant Chemistry® The Journal of All Power Plant Chemistry Areas

ISSN 1438-5325

International Edition April Volume 6 (2004), No. 4

Abstracts

Flow Restrictions in Water-Cooled Generator Stator Coils – Prevention, Diagnosis and Removal

Robert Svoboda, Christoph Liehr, and Hans-Günter Seipp
Part 4: Chemical Cleaning of Water-Cooled Generator Stator Coils by the Cuproplex® Method

The Cuproplex process for removing copper oxides from generator cooling systems is characterized by the coordinated use of complexants, oxidants and auxiliary chemicals. The process can be performed off-line, as well as on-line with the generator in operation.

Off-line cleaning is usually done by injecting the dilute chemicals into the running pure-water system, sequentially over several cycles. On-line cleaning employs the continuous injection of chemicals at a sufficiently dilute concentration to keep conductivity below maximum allowed limits. On-line cleaning does not interfere with generator availability and provides real-time monitoring of the cleaning effects. However, on-line cleaning takes longer. The reagent and the dissolved copper are absorbed in the ion exchanger that is part of the system and disposed of as solid waste. The process thus offers the possibility of zero-liquid discharge.

Hugh P. Fallon
A Performance-Based Approach to Cooling Water Chemistry Control

Cooling water treatment programs traditionally rely on the application of chemical products to design-based residuals, with the use of external – typically reactive – analysis and monitoring techniques to maintain system performance. Such programs can be inherently inefficient, using too much or too little chemical at the wrong times. Decision-making is often based on how the system was behaving in the past, not how it is performing currently, or how it may perform in days or weeks to come.

The Otahuhu B Power Station is a modern 380 MW single-shaft combined cycle facility, incorporating a low-cycle, estuarine water, evaporative hybrid cooling tower. A comprehensive control and instrumentation project is underway to modernise the cooling water treatment program. The ultimate goal of this project is to move from a passive control system with very little monitoring to one based around real-time, on-line, semi-predictive performance monitoring techniques that proactively manage the application of varying residuals according to actual system requirements. Control programs are being designed to assess the known system parameters and the plant performance, and to dose chemical on the basis of that performance according to rules-based logic. Work to date has already resulted in a more efficient dosing regime, significantly reducing chemical treatment costs, while simultaneously improving the overall plant monitoring and helping to minimise the environmental impact of discharged effluent.

Geoff Spowart
Implementing the Power Station Cooling Water Standard AS 5059-2003

The new Australian standard "Power Station Cooling Tower Systems – Management of Legionnaires' Disease Health Risk" (AS 5059-2003) was released in September 2003 following several years of work by a large number of chemists in the power industry. The standard uses a risk based methodology to allow power stations to develop plans to minimise *Legionella* levels in cooling water systems.

This paper addresses the issues that stations are likely to encounter in meeting the requirements of the standard. The paper discusses the impacts of the:

- cooling system design,
- operating and maintenance philosophies,
- characteristics of the makeup water,
- biocide treatment program,
- alternative treatment program,
- monitoring requirements and
- reporting requirements.

Abdolreza Zaltash, Andrei Petrov, D. Tom Rizy, Rick Langley, and Eric Hubbard
Emissions Levels of Various Gas Microturbines

The variety of new distributed generation (DG) technologies, such as gas microturbine generators, as well as of integrated energy systems (IESs) has increased markedly over the last several years. Oak Ridge National Laboratory and EPRI PEAC have worked collaboratively to test various DG machines, including 30 to 80 kW microturbine generators (MTGs). Environmental issues are among the most important aspects of operating these DG systems. This paper addresses the emissions from MTGs of various makes and sizes. The two basic emissions components – carbon monoxide (CO) and nitrogen oxides (NO_x) – were given close attention. For each MTG, emissions at steady-state operation were measured at different power output levels. For transient tests the emissions were measured as the MTG power output varied during startup, shutdown and during power dispatch (as the power varied from one setting to another). Evaluation of the various emissions levels for the different MTGs was performed as well as of compliance with existing environmental regulations (U.S. and Europe) and manufacturer's data.

Down Under – The ESAA's Conference "Power Station Chemistry 2004"

In April 2004, the Energy Supply Association of Australia Limited (ESAA) in conjunction with Connell Wagner PPI held its "Power Station Chemistry 2004" conference in New South Wales, Australia. In this paper, the ESAA and the conference venue are briefly introduced and some details illustrating the flair of the conference are presented. The conference organizers succeeded in making possible an extended exchange of experience in a nice and informal atmosphere with more than thirty high-level technical papers.

Please send me copies of the following articles published in your April 2004 journal issue (US$10 per copy, minimum order US$15) as PDF files by E-mail (E-mail address required):

Flow Restrictions in Water-Cooled Generator Stator Coils – Prevention, Diagnosis and Removal **Robert Svoboda, Christoph Liehr, and Hans-Günter Seipp** **Part 4: Chemical Cleaning of Water-Cooled Generator Stator Coils by the Cuproplex® Method**	☐
Hugh P. Fallon **A Performance-Based Approach to Cooling Water Chemistry Control**	☐
Geoff Spowart **Implementing the Power Station Cooling Water Standard AS 5059-2003s**	☐
Abdolreza Zaltash, Andrei Petrov, D. Tom Rizy, Rick Langley, and Eric Hubbard **Emissions Levels of Various Gas Microturbines**	☐
Down Under – The ESAA's Conference "Power Station Chemistry 2004"	☐
Kurzfassungen der englischen Beiträge	☐
Please send me the April 2004 issue of your journal (US$15 per copy) by surface mail	☐
Please send me the April 2004 issue of your journal (US$20 per copy) by air mail	☐

Total: US$.....

Name: .....

Company: .....

Company address: .....

City: .....

Postal/ZIP code: .....

Country:

VAT Id. No. (EC countries only):

E-mail address: .....

Charge my credit card:

Master/Eurocard ☐ **VISA** ☐

Amex ☐ **Card Holder's Address (City)** .....

Credit Card Number: ..... **Expiration Date (MM/YY):** .....

Name of Cardholder as Printed on the Card: .....

Signature: ..... **Date:** .....

Mail this form to: **PowerPlant Chemistry GmbH**
P.O. Box 169
68806 Neulussheim, Germany

Fax this form to: **+49-6205-37883**