

ABSTRACTS

The Heller System: The Economical Substitute for Wet Cooling

András Balogh and Zoltán Szabó

As a result of growing environmental awareness – at least in the form of verbal statements – there is a consensus about the importance of applying water conservation type cooling systems. In practice, however, their application is still far behind that of the water-thirsty cooling methods. This paper introduces one of the proven dry cooling systems: the advanced Heller system (an indirect dry cooling) and its dry/wet derivatives. Besides giving a basic technical and environmental review, results of some economic case studies are also presented. These show how a natural draft Heller system can extend the economic viability of water conservation type cooling systems as compared to wet cooling.

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Update on the Development of Ultra-Low Residual Resin for Condensate Polishing Applications

Peter A. Yarnell

This paper reports on the application of a strongly basic anion resin with ultra-low residual chloride content. The first resin charge installed five years ago at a pressurized water reactor nuclear power station remains in service, having produced more than 26 billion liters of condensate without any regeneration and with a current chloride leakage of significantly less than $10 \text{ ng} \cdot \text{L}^{-1}$. The development and testing of an ultra-low sulfate strongly acidic cation resin, particularly for use in condensate polishers in boiling water reactor units, is also discussed. Data from plant trials is presented.

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Use of Unique Fractional Electrodeionization in Power Plant Applications

Devesh Mittal, Venkat Jagannathan, and Narender Singh Bisht

This paper reports on the application of fractional electrodeionization (FEDI) in the production of deionized water. The advantages of this two-stage dual-voltage technology over conventional electrodeionization (EDI) are discussed, including better quality of treated water, higher feed hardness tolerance, ability to handle feedwater quality fluctuations, optimized power consumption, and on-site regeneration of media. Operating data and experience from two power plants are presented.

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Chemical Aspects of Flexible Operation

Mark Robson

This paper summarises the two sessions and discussion points of the workshop on the "Chemical Aspects of Flexible Operation" held at the recent British and Irish Association for the Properties of Water and Steam (BIAPWS) symposium. Plant design, sampling and instrumentation, and operational issues are addressed, as well as chemical control aspects, operational experience, and operator training.

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Organic Chemical Treatment of High Purity Boiler Feedwater – Advantages and Limitations

James Robinson, Robin Kluck, Anthony Rossi, and Luis Carvalho

This paper addresses the application of organic chemicals to treat high purity boiler feedwater. The advantages and limitations of organic chemicals are presented to help plant operators assess the potential value of using organic chemicals in their systems. Their proper use can provide increased corrosion protection not available through the use of inorganic chemicals alone. The authors have found no evidence that these organic treatments or their decomposition products have caused corrosion problems as long as pH is adequately maintained. Many operators avoid using organic chemical treatments because their use causes them to exceed the turbine manufacturer's steam cation conductivity limits, although meeting such limits does not assure that potentially acidic species such as chloride and sulfate are within an acceptable range. Thus it is argued that improved criteria for steam purity and plant friendly methods of monitoring those criteria are needed.

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