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ABSTRACTS

Smart Cycle Chemistry Alarms: Intelligent, Actionable Alarms

Mike Caravaggio and Brad Burns

Fossil and combined cycle power plant operations continue to evolve and introduce new challenges to the management of the cycle chemistry program. Two of the main drivers have been cost reduction and increased flexible operation. This has led to a reduction in cycle chemistry expertise at plants, while there has been a simultaneous increase in the complexity of managing the chemistry program. The development of smart cycle chemistry alarms is a methodology to respond to these challenges and improve corrosion and deposition control at power plants. The concept is simple: use independent signals to diagnose and confirm excursions and chemistry events as they occur in the power plant so that non-expert personnel can respond appropriately. This paper discusses the philosophy for developing smart alarms. It builds on cycle chemistry validation work presented at previous Electric Power Research Institute (EPRI) International Cycle Chemistry conferences and will include some application examples of the EPRI approach to smart cycle chemistry alarms.

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Dispersant Injection Strategy Optimization at South Texas Project

Iain Duncanson, Dan Sicking, Keith Fruzzetti, Michael Garner, Charles Clinton, and Chancey Pence

The use of dispersants in pressurized water reactors has been extensively qualified by the Electric Power Research Institute (EPRI) as a viable and effective technology for significantly reducing the fouling rate of steam generators and has contributed to improvements in steam generator thermal performance. Several specific strategies for the application of dispersants are qualified for use at utilities including continuous online injection, steam generator wet layup and long-path recirculation (start-up).

The South Texas Project has been at the forefront of the industry dispersant implementation program and is the first nuclear utility to implement dispersant injection with the use of full flow, deep bed condensate polishing. The South Texas Project dispersant injection program was implemented as a continuous, online strategy for optimizing steam generator thermal performance and managing steam generator deposit inventories. Operating experience has shown that an online batch-type dispersant injection strategy may provide similar benefits to those realized from an online continuous injection strategy whilst providing cost saving benefits and minimizing exposure of condensate polisher resin to dispersant. This paper summarizes South Texas Project dispersant experiences and provides rationale for transitioning to a batch-type injection strategy.

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Corrosion and Deposits in Water-Cooled Generator Stator Windings: Overview of Water Cooling of Generators

Robert Svoboda and Wolf-Dietrich Blecken

The most common and severe problem related to corrosion and deposits that has arisen with generator water cooling throughout its more than 50 years of history is plugging of copper hollow conductors. This article gives an introduction to a series of four additional articles to appear in this journal on these issues, in particular problems with copper hollow conductors. The main goal of this series is to give a detailed update on the mechanism, prevention, diagnosis, and removal of flow restrictions in water-cooled generator windings.

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Corrosion and Deposits in Water-Cooled Generator Stator Windings: Part 1: Behaviour of Copper

Robert Svoboda

The most common and severe problem that has arisen with generator water cooling throughout its more than 50 years of history is plugging of copper hollow conductors. A 4-step model of the occurrence of this plugging was developed to indicate the influencing parameters. The steps are oxidation of the copper surface, release of the oxidized copper, migration of the released copper, and re-deposition of the migrating copper. It is observed that these steps are influenced by water chemistry as well as by system and component design. From the operating side, adherence to a suitable water chemistry regime as well as proper lay-up practice help to avoid or mitigate flow restrictions.

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