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Flow-accelerated Fossil and Combined

Details at www.facfossilhrsgconference.com

Although the mechanism of flow-accelerated corrosion (FAC) in fossil plants has been mostly understood for nearly 40 years, it remains one of the major safety issues for plant management and personnel. It can occur across the feedwater system, from the condensate pump to the economizer inlet, with the heater drains systems being particularly prone. It is equally dangerous in both single- and two-phase flow regions.

In combined cycle/HRSG plants, FAC is the leading cause of availability loss in the HRSG and also occurs in both the single- and two-phase varieties. FAC also is the major damage mechanism in air-cooled condensers.

In all of these systems, cycle chemistry influences, and in some cases, controls FAC. It has become clear that FAC should not just be considered as a failure mechanism but also as a major cause of corrosion in the cycle leading to higher levels of transported corrosion products. These corrosion products act as the centers for many other failure and damage mechanisms.

Thus recognition, control, and alleviation of FAC should be one of the most important management-supported aspects of running a power plant in today's world. Most often, however, this is not the case and staff are directed to address a plethora of other activities until once again a serious FAC incident occurs somewhere in the world.

This international conference is being called to provide the fossil and combined cycle industries with broad and expert experience in all aspects of FAC. The major conference themes are to review, document, and transfer technology on the most recent developments in understanding the mechanisms, root causes of FAC, the management tools and approaches, the predictive processes, the cycle chemistry, the NDE techniques and assessment technologies, and the application of permanent solutions.

Who should attend, and why Plant, Asset, and Technical Services Managers will gain insight as to the prevalence of FAC across the industry.

Piping Engineers and FAC Program Managers will learn about available technologies for FAC inspection and methods to select locations susceptible to FAC.

Operations Managers will learn how plant operating practices can impact single- and two-phase FAC damage.

Maintenance Managers will gain a better perspective on how visual assessments can identify FAC damage in a number of fossil plant components.

Chemists/Chemical Engineers will gain better understanding of how feedwater chemistry should be selected and optimized to reduce single-phase FAC damage rates by several orders of magnitude.

Metallurgical and Materials Specialists will be advised of the features which confirm FAC during metallurgical examination.

Tuesday, June 29

PLENARY SESSION

- **Although Understood, FAC Remains an Enigma**, B. Dooley, Structural Integrity
- **Reflections on FAC Mechanisms**, D. Lister, University of New Brunswick, Fredericton, Canada, and S. Uchida, Institute of Applied Energy, Japan
- **The NDE Options for FAC**, S. Walker, EPRI, Charlotte, NC

SESSION 2: FAC Experiences and Programs #1

- **Tarong Power Station. A Life with FAC and the Learning Curve to Now**, D. McInnes, Tarong Energy, Australia
- **Ameren UE FAC Inspection Program**, G. Rogles and W. Mueller, Ameren, St. Louis, MO
- **Ensuring Safe and Reliable Operation of High Energy Piping for FAC**, P. Waldrop, PacifiCorp, Salt Lake City, UT
- **Ten Year Retrospective Look at HRSG FAC Assessment and Incidence**, P. Jackson and D. Moelling, Tetra Engineering, Weatogue, CT

SESSION 3: FAC in Air-cooled Condensers

- **FAC of Air-cooled Condenser in China Yushe Plant**, L. Zhigang, TPRI, Xian, China

- **Capital Power ACC FAC Study**, W. Stroman, Capital Power, San Diego, CA

SESSION 4: Proactive FAC Programs

- **FAC Experiences**, F. Gabrielli, Alstom, Windsor, CT
- **The Development and Optimization of a FAC Program for a Pre-Operational HRSG**, M. Daycock and A. Olszewski, Constellation Energy, Baltimore, MD

SESSION 5: FAC Experiences and Programs #2

- **CS Energy's FAC Experience**, R. Bianchi, G. Joy, B. Kerr and I. Richardson, CS Energy, Brisbane, Australia
- **Lessons Learned from Fossil Plant FAC Assessments**, B. Dooley, K. Shields and S. Shulder, Structural Integrity

Wednesday, June 30

SESSION 6: FAC in Combined Cycle/HRSG Plants

- **HRSG Designs and Their Effect on FAC Risk**, A. Sieben and L. Stanley, HRST, Wayzata, MN
- **NEM's Approach to FAC**, P. Honcoop, NEM, Leiden, The Netherlands
- **FAC in HRSGs**, B. Dooley, Structural Integrity, and R. Anderson, Competitive Power Resources, Palmetto, FL
- **HRSG Design-Related Influences on FAC**, J. Schroeder, Nooter/Eriksen, Fenton, MO

SESSION 7: NDE and Material Analysis for FAC

- **Applications of Pulsed Eddy Current for FAC in Fossil Plants**, L. Volkman, RTD, Bloomington, MN
- **EdF Plant Experience in Chromium Measurement to Improve FAC Rate Calculations with BRT-Cicero**, S. Trevin, P. Guillot, H. Adghar and T. Knook, EdF, Grenoble, France
- **Demonstration of Guided Wave Ultrasonic Testing for FAC Damage**, C. Chaney, Structural Integrity and S. Walker, EPRI, Charlotte, NC
- **Use of Handheld Xray Fluorescence (XRF) in the FAC Protocol**, J. Walker, Thermo Fisher Scientific, Billerica, MA

- **Relating Five Decades of Fossil Cycle**

Corrosion (FAC) in Cycle/HRSG Plants

An International Conference

June 29-July 1, 2010 • Westin Arlington (Va) Gateway Hotel

Conference Chairmen



Barry Dooley



Kevin Shields

Structural Integrity Associates

International Advisory Committee

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Participating Organizations

Structural Integrity Associates

Electric Power Research Institute (EPRI)

CEATI International

PowerPlant Chemistry

Combined Cycle Journal

Chemistry with FAC Control, A. Bursik, PowerPlant Chemistry, Neulussheim, Germany

○ **The Use of ORP in Controlling FAC**, D. Cicero, Nalco, Naperville, IL

SESSION 9: Fossil Plant FAC Experiences and Programs #3

○ **An Overview of Eskom's FAC Programme in Fossil Plants**, K. Northcott, Eskom, South Africa

○ **AEP's Approach to FAC**, D. Hubbard and J. Anderson, AEP, Columbus, OH

○ **Flow-accelerated Corrosion of Fossil Plant Equipment: Issues and Solutions**

Exhibition, sponsorships

There will be a special vendor exhibition throughout the conference for organizations associated with every aspect of FAC. Sponsorships also are available. Contact: Molly Hawkins, Special D Events, 248-336-8605, molly.hawkins@specialdevents.com.

(Russian Experience), T. Petrova, L. Seleznev and I. Burakov, Moscow Power Institute, Moscow

○ **FAC Program at Constellation Energy**, A. Olszewski, Constellation Energy, Baltimore, MD

Thursday, July 1

SESSION 10: FAC Predictive Codes and Modeling

○ **FAC Mitigation at Le Havre Units 2 and 4 with BRT-Cicero**, S. Trevin, M. Persoz, S. Friol and H. Hanifi, EdF, Grenoble, France

○ **Numerical Modeling of Local FAC of Metal using RAMEK**, G. Tomarov and A. Shipkov, Geotherm, Moscow

○ **FAC Analysis with the Software Tool COMSY**, H. Nopper, Areva, Erlangen, Germany

○ **Mathematical Modeling at Cycle Chemistry Monitoring System to Evaluate FAC**, V. N. Voronov, P. M. Gotovtsev, and D.S. Smetanin, Moscow

Power Institute, Moscow

SESSION 11: FAC Flow Modeling

○ **FAC: Numerical Simulations of the Flow Field and Mass Transport in Fittings**, A. Herszage and D. Zinemanas, Israel Electric

○ **Identification and Control of Factors Influencing Flow-Accelerated Corrosion in HRSG Units using CFD Modeling, Full Scale Air Flow Testing, and Risk Analysis**, R. Pietrowski and B. Manzano, ConEd, New York

○ **Computed Radiography – A Useful Tool for Detecting FAC**, C. May, Virtual Media Integration, Pensacola, FL

SESSION 12: Fossil Plant FAC Experiences and Programs #4

○ **Tri-State G&T's FAC Monitoring and Repair Program**, E. McArthur Jr. and T. Gilchrist, Tri-State G&T, Denver, CO

○ **Japanese Experience with FAC in Fossil Plants**, J. Ohta and H. Hirano, CRIEPI, Japan

○ **The Experiences of the New Zealand Fossil Power Industry with the Challenges of FAC – Issues and Solutions**, D. Addison, Thermal Chemistry; S. Addison and K. Hopkins, Genesis Energy; K. Baker and M. Young, Contact Energy, all New Zealand

SESSION 13: FAC Mechanism

○ **FAC – Chemical, Metallurgical and Operational Considerations for Its Prevention**, M. Rziha, Siemens, Erlangen, Germany

○ **Carbon Steel Corrosion in the Low Pressure Turbine Exhaust Environment**, A. Howell, Xcel Energy, Golden, CO

○ **Evaluation of Wall Thinning Rates due to FAC with the Coupled Model of Static Electrochemical Analysis and Dynamic Double Oxide Layer Analysis**, S. Uchida, M. Naitoh, and M. Okada, Institute of Applied Energy, Japan, and S. Koshizuko, Univ of Tokyo, and D. Lister, Univ of New Brunswick, Canada

Friday, July 2

FAC Experts Panel and Roundtable Discussion

○ **Discussion on Topics Covered and "Not" Covered**

○ **Questions and Answers**