

20Sep 07

'Two Shifting' Conference

International Conference on:

Cyclic Operation of Power Plant

Maintenance, Operation, Materials and Cost Issues
(Conventional Steam Plants & CCGTs)

Note: The Conference will be preceded by a 1 or 2 day Course (25-26 September - with the option of attending for 1 or 2 days) on 'Maintenance, Inspection and Monitoring of Power Plant Boilers'. For details please see: www.etc1.co.uk

Venue: Institute of Materials (IOM3), London
www.iom3.org

Dates: 27 - 28 September 2007

Final Programme
+ Registration Form

ORGANISER



European Technology Development (ETD), UK

Cyclic Operation of Power Plant (Two Shifting) Conference

OBJECTIVES

Because of changes in demand and competition within the power generation market, fossil fuel fired plants in many countries are now subject to unscheduled cyclic operation, two shifting or load following. Even state-of-the art natural gas fired combined cycle plants are now in a scenario where two shifting is a threat to profitability. The aim of the Conference is to identify the basic causes of equipment and component problems in two shift operation, and to begin to identify procedures which will minimise operating and maintenance costs.

The intention is to provide an international forum for the exchange of knowledge, information and experience. Hence plant owners and operators will be the prime audience in this seminar. It is also envisaged that researchers, plant manufacturers and inspection bodies will benefit from this experience/ information exchange. The underlying aim will be 'how to reduce costs associated with plant cycling'. Key aspects will be engineering design and materials R&D, cost analysis and plant management.

TECHNOLOGY BACKGROUND

The severe conditions of cyclic operation can, at worst, result in an increase in unscheduled outage rates due to an increase in the frequency of failures of key items of equipment, such as boiler plant, steam and gas turbines, and alternators. Clearly such events could have a dramatic effect on costs.

Even normal two shift operation will have an untoward effect on profitability, primarily due to increased wear and tear of components, this impacting on operating, overhaul and maintenance costs. However two shifting will often imply an increased NDT budget, extra training for plant operating personnel, replacement of critical components and automation of the plant to ensure faster safer start ups and shutdowns. The nature of the creep-fatigue interaction is such that ageing plant which have seen a good deal of operating life under base load conditions could show dramatic drop in component safe operating life when subjected to cyclic operation.

Specific objectives of the seminar will therefore be to discuss and identify:

- Key equipment design, materials and corrosion aspects
- Operational constraints
- Manpower, management and automation issues
- Component replacement, maintenance and operating costs
- Strategies for optimising cyclic operation.

The organisers of this seminar on Cyclic Operation of Power Plant, namely ETD are involved in detailed review of the technical and cost issues of plant cycling. Their experience and studies include plant from Europe, North America and Australasia. The Seminar is an extension of this study and an opportunity to exchange information on experience worldwide.

CONFERENCE SCOPE & INVITATION FOR PAPERS

The Conference will cover technical matters and will include plant experience and research issues. It will further include manpower, plant automation and cost issues. In the case of CCGTs both turbines and heat recovery plant issues will be covered.

Submission of full Papers will be required by 6th September 2007.

Conventional Steam Plant

- thermal fatigue on HP, LP turbines, steam chests, boiler headers, air heaters, steam lines.
- stress corrosion and corrosion fatigue on cracking of LP turbines, generator end rings, boiler parts, superheater, and reheater pipework and hanger supports.
- oxide scale spalling and enhanced erosion corrosion of plant internals, particularly due to reheater pipework operating in excess of normal temperatures.
- fireside corrosion and erosion
- reliability, maintenance, slagging and fouling corrosion and erosion of back end components
- over-heating on pipework and generator system components.
- low cycle fatigue on electrical generator components.
- enhanced materials degradation on FGD systems
- water treatment plant issues
- need for additional instrumentation
- requirements for automation of plant
- development of inspection strategy, plant condition monitoring and outage /repair strategies
- costs associated with cyclic operation (fuel, manpower, engineering costs, repairs etc)
- improvements to plant and operating procedures to optimise cost effectiveness.

Combined Cycle Gas Turbines

- Experience with plant cycling and component response
- Creep-fatigue of turbine blades
- Cracking and degradation of combustor cans
- Effect of cyclic operation on thermal barrier coatings
- Thermal fatigue of heat recovery steam generators
- Stress corrosion cracking when using air cooled alternators

Oral presentations will be as follows:

- Keynote Papers = 27 minutes + 3 minutes for discussion.
- Other Papers = 22 minutes + 3 minutes for discussion.

Technical enquiries to:

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PUBLICATION: Proceedings in the form of CDs containing full Papers or Presentations and prints of Abstracts will be provided at the Conference.

DAY 1 – PLANT EXPERIENCE AND DESIGN ISSUES

0930 – 1015 - Registration

1015 – 1020: Introduction and Welcome to the Seminar

Session I: Plant Operation and Design Issues 1020 – 1500 hrs

1020 – 1050: *Keynote Paper*: **Two Shifting Operation of Power Plants and the Future Energy Needs of Europe**

Fred Starr, Senior Consultant, European Commission, JRC Petten, Europe

1050 – 1115: **Start Up Optimization**

Frank de Vos, Material, Environmental & Chemical Consulting (MEC) Technical & Operational Services (TOS), KEMA, The Netherlands

1115 – 1140: **Lifetime Management - Lifetime Analysis of Highly Stressed Steam Turbine Components and Turbine Flexibility Enhancement**

Michael Siegel, Norbert Henkel, Edwin Gobrecht, Hans Rauschenbach, Siemens Power Generation, Muelheim/Ruhr, Germany

1140 – 1205: **Modifications Applied to Bring Back 6 x 200 MW Non Reheat Steam Turbine Generators to Two Shifting Service After a 15 Year Period of Mothballing**

Hugo De Koningh, Turbine Consultant, Pangaea, c/o Elephant Road & Steenbok Avenue, Pretoria, South Africa

1205 – 1230: **Impact of Transients in Stress and Environments on Environment Assisted Cracking of Steam Turbine Steels**

S Zhou and A Turnbull, National Physical Laboratory, Teddington, UK

1230 – 1330

LUNCH BREAK

+ Showing of the Maintenance Advisor Software (MAS)

(Session1: Continued)

1330 – 1400: *Keynote Paper:* **Impact assessment of two-shifting operating mode on boiler components**

Célia Domecq, Patrick Le-Delliou, Marie-Agnès Garnero, Véronique Verrier, EDF R&D/Industrial Risk Management Department, Chatou Cedex, France
Kevin Pepper, EDF Energy/ Energy Branch, London, UK

1400 – 1425: **Getting Reliable Turbine Bypass System Performance in Cycling Power Plant**

Ron Adams, Ulrich Kaegi, Sanjay Sherikar, Control Components Inc., California, USA

1425 – 1500: **Five-minute contributions by the delegates with regards to their plant experience**

Delegates in this conference represent utilities, plant manufacturers, consulting companies and other organisations from 20 countries and five continents. This time slot has been reserved to give you an opportunity to make a short informal presentation with or without slides



1500 – 1530: Coffee Break

Session 2: Materials and Remaining Life Issues

1530–1740 hrs

1530 - 1600: Keynote Paper: Damage and Remaining Life Estimation in High Temperature Plant With Variable Operating Conditions (a P91 Case Study)

H C Furtado, CEPEL, Rio de Janeiro, Brazil

L H de Almeida, COPPE, Universidade Federal do Rio de Janeiro, Brazil

I Le May, Universidade Federal do Rio de Janeiro, Brazil and Metallurgical Consulting Services, Saskatoon, Canada

1600 - 1625: The TMF Stress-Strain Characteristics of Creep-Resistant (P91, P92) Steels

J Okrajni, A Marek, G Junak, Department of Mechanics of Materials, Silesian University of Technology, ul. Krasińskiego 8, 41-403 Katowice, Poland

1625 – 1650: Effect of the Temperature and Oxidant Atmosphere on the Inconel 600 Behaviour Under 4-Point Bending Sollicitation

A. Haouam, G. Moulin*, J. Favergeon*, B. Merzoug***

** Laboratoire ROBERVAL, FRE CNRS 2833, Centre de Recherches de Royallieu, Université de Technologie de Compiègne, BP 20529, F-60205 Compiègne, France*

*** Département de Génie Mécanique, Université d'Annaba, BP 12, Annaba - Algeria*

1650 – 1720: Evaluation of the Integrity of Power Plant Equipment Based on Inspection, Monitoring and Computational Diagnosis

H C Furtado, R. O. Rocha, M A C Michalski, CEPEL, Rio de Janeiro, Brazil

I Le May, Metallurgical Consulting Services, Canada

1720 – 1740:

PANEL DISCUSSION -

PLANT CYCLIC OPERATION AND INTEGRITY ISSUES

Conference Dinner: 1930 - 2230 hrs

DAY 2 - Cyclic Operation of CCGTs/ HRSGs

Session 3: Hot Section Gas Turbine and HRSG Issues 0900 – 1530 hours

0900 – 0930: *Keynote Paper*: **HRSG Optimisation for Cycling Duty Based on Euro Norm EN 12952-3**

Pascal Fontaine, Jean-François Galopin, CMI Energy, Belgium

0930 – 0955: **Operational Flexibility Enhancements of Combined Cycle Power Plants**

Norbert Henkel, Erich Schmid, Edwin Gobrecht, Siemens Power Generation, Germany

0955 – 1020: **Implications for the Cyclic Operation of HRSGs Using of 9-12Cr Martensitic Steels**

Ahmed Shibli, European Technology Development, Leatherhead, Surrey, UK

1020 – 1045: **HRSG Operation, Maintenance and Materials Issues and the Role of the USA HRSG User's Group**

R Anderson, Chairman HRSG Users Group, USA



New Title

1045 – 1115: Coffee Break

1115 – 1145: *Keynote Paper*: **Life Consumption, Assessment and Monitoring of HRSGs**

A Pasha, Vogt Power, USA



New Paper

1145 – 1210: **Determining the Effect of Cycling on EB-PVD Ceramic Thermal Barrier Coatings of V94.3A2 First Stage Blades by the Use of Non-Destructive PLPS (Photoluminescence Spectroscopy) Technique**

C Rinaldi, L De Maria, CESI RICERCA, Milan, Italy

1210 – 1235: **HRSG Maintenance, Monitoring and Lifing Issues and the Effect of Cyclic Operation**

D Robertson, European Technology Development, Leatherhead, Surrey, UK

1240 – 1345: LUNCH BREAK

1345 – 1410: Development of Inspection and Test Techniques to Evaluate Damage Mechanisms Occurring in Power Plants after Many Years of Cyclic Operation

R D Lant, R Day, RWEnpower, UK

1410– 1435: Effect of Operating Regime on Equipment Risk

Ian Partridge, Chris Ablitt, Brian Cane, TWI Ltd., UK

1435 – 1500: Aspects of Common Creep-Fatigue Action in Thermo-Resistance Steels Used for Welded Structures

Horia Stefan MATEIU, Traian FLESER, Alin MURARIU, Nicolae FARBAS

National R-D Institute for Welding and Material Testing – ISIM Timisoara, Romania



Panel Discussion: 1500 – 1530 hrs

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Registration Form

(Please copy and post/ fax/ e mail)

Registration Fee (amount payable is that shown in the 'Fee + VAT' column). This is being charged as follows (all figures are in pound sterling):

	Until 6 September 2007		From 7 September 2007	
	Fee	Fee + VAT @ 17.5% (amount payable)		Fee + VAT @ 17.5% (amount payable)
Delegate	£290	340.75	£340	399.50
Speaker	£240	282.00	£290	340.75

The Fee covers the Conference Proceedings, coffee, lunches, and the Conference dinner.

Payment of Fee can be paid by the following methods:

- a) By sending a **UK bank cheque** made payable to 'ETD Ltd'.
- b) **Bank-to-bank transfer** (ETD bank account details will be sent on request).
- c) **Credit Card**. Payment can be made using Visa, Mastercard, American Express, Switch, JCB etc. (except Diners Club). For security reasons please provide the following information (only by *fax or post*):

Name of account holder:

Credit card number:

Card expiry date:

Amount to be paid (in UK pounds):

Signatures:

Information on **hotel reservation** will be provided on request. As London hotels are busy during summer this information should be asked for as soon as possible.

Information required for the delegate badge

Your title and full name:

Company:

Position (optional):

Address:

Phone:

Fax:

E-mail:

Please put x in the relevant box below:

I will attend as a delegate.

I will attend as a presenter.

Brief Title of your Paper:

I will like to receive information about hotel accommodation.

Proof of payment of my Registration Fee is attached.

Please post/ fax/ e-mail this Form to:

Address for Registration: European Technology Development Ltd., 6 Axis Centre, Cleeve Road, Leatherhead, Surrey KT22 7ND, UK registration@etd1.co.uk
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