International Training Course: Two Back-to-Back stand-alone but related courses

**Power Plant - Boilers & Steam Turbines**

**Remaining Life Assessment**

**23rd May 2016 - Boiler Remaining Life Assessment Course**

**24th May 2016 - Steam Turbine Remaining Life Assessment Course**

**Venue:** Campanile Hotel, Wrocław – POLAND

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**Speaker’s Profile**

- **Prof Fujimitsu Masuyama**, Professor in Kyushu Institute of Technology, Japan
- **Dr David Robertson**, Lead Metallurgist, ETD Consulting, UK
- **Mr. Alexandros Antonatos**, ETD Consultant
- **Dr Ahmed Shilbi**, Managing Director, ETD Consulting
- **Dr Sc. (Eng.) Jerzy Pasternak**, QA/AC Director of Mazur Energy
The objective is to provide an international forum for the exchange of knowledge, information and experience. Hence plant designers, manufacturers, owners and operators will be the prime audience in this training course. It is also envisaged that researchers, materials producers and inspection bodies will benefit from this experience/information exchange. New plants using relatively new steels such as P91, P92, etc. and A-USC plants planning to use yet newer and more advanced materials require a better understanding of their behavior in cycling power plants and new database for their creep-fatigue interaction behavior.

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

- **Boiler Life Assessment**
- **Turbine Life Assessment**
- **Materials and Damage Mechanisms**
- **Inspection and Life Assessment Issues**

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**Exhibition Opportunities**

This international Training Course is expected to be attended by plant operators, manufacturers, researchers, steel producers and service providers. That will be a great opportunity for the exhibition of your products/services.

For information and costs involved please contact: **Mrs. Elżbieta Wiśniewska**

e-mail: elzbieta.wisniewska@mazurenergy.pl; phone: +48 516 282 014
European Technology Development (ETD) is a UK based engineering advisory, consulting and R&D company specializing in high temperature plant life assessment/extension, maintenance, materials and engineering issues in all type of power generating and petrochemical/process plant. Consulting is the core business of ETD. ETD has been organizing for nearly two decades various international workshops/courses/conferences in Europe, USA and Asia mainly on the issues such as: industrial plant life assessment/extension, high temperature plant materials, plant component safety and durability, performance of in-service welds, power plant cycling, risk based maintenance (RBM), probabilistic assessment, weld repairs etc. The company has been leading and coordinating a number of large leading edge international industry initiatives (supported by the industry from North America, Japan, Europe and elsewhere or by government organizations such as the European Commission) on issues related to the assessment and improvement of high temperature plant performance, materials and design, maintenance and inspection strategies. Further information about ETD, its projects, life assessment courses offered and other activities can be seen at: www.etdconsulting.com In the past ETD has organized a number of conferences, seminars and Training Courses in London, Germany, Portugal, France, Poland, USA, Japan, Middle East, Africa and South East Asia on P91, P92, P23 and P24 issues. ETD has furthermore published a number of guidelines and review reports on these issues for its international industry sponsors.
08:30 – 08:45 Registration, Welcome and Presentation of organizer

Presentation of Mazur Energy: Selected properties of new creep resistance material for A-USC Power Plants 30 min 08:45 – 09:15

Dr Sc. (Eng.) Jerzy Pasternak
QA/QC Director of Mazur Energy

Stage 1: Life Assessment

Dr David Robertson, ETD Consulting, UK 2 hrs 40 min 09:15 – 12:15 (with 20 minutes break)

Specific topics will include:
• Reviewing plant records.
• Deciding critical damage mechanisms.
• Basic Stress calculations.
• Analytical assessment methods; parametric models, damage fraction rules.
• Developing Future Actions.

Coffee Break 11:00 – 11:20

Stage 2: Life Assessment

Mr. Alexandros Antonatos, ETD Consultant 1 hr 45 min 12:15 – 15:00 (with 1 hr lunch break)

Specific topics will include
• Standard inspection techniques (MT/PT, UT, etc).
• Metallographic replication and strain measurement methods.
• Case Studies.

Lunch 13:00 – 14:00
Stage 3: Life Assessment

Dr David Robertson, ETD Consulting, UK 2 hrs 10 min 15:00 – 17:30 (with 20 minutes break)

Specific topics will include:

- In-depth inspection (material sampling, boroscopy).
- Plant monitoring.
- Mechanical Testing.
- Cost effective management strategies.
- Case Studies.

Coffee Break 16:00 – 16:20

Dinner 18:00 – 19:00

TRAINING COURSE DAY TWO

Tuesday, 24th May 2016

Steam Turbine Remaining Life Assessment

09:00 Beginning of Module 1

Module 1: Materials and Damage Mechanisms

Dr David Robertson, ETD Consulting, UK 2 hrs 10min 09:00 – 11:30 (with 20 minutes break)

Specific topics will include:

- Material selection and advancement for steam turbine components.
- Steam turbine component damage/failure mechanisms and implications for key components.
- Problems arising from thermal cycling, low load operation.

Coffee Break 10:30 – 10:50
Module 2: Inspection and Life Assessment Issues

Prof F Masuyama,
Kyushu Institute of Technology (EX-MHI),
Japan

**2.5 hrs:** 11:30 – 15:00 (with 1 hr lunch break)

Mr Alexandros Antonatos,
ETD Consultant

**Specific topics will include:**

- Steam turbine maintenance issues.
- Accessibility for established and new inspection techniques.
- Best engineering strategies/solutions to minimise problems arising from thermal cycling.
- Condition monitoring and outage/repair strategies, including weld repair procedures.
- Equipment modifications and improvements required for plant cyclic operation.
- Material properties: toughness, creep/stress rupture, crack growth, metallurgy
- Life assessment techniques for turbine components

**Lunch 13:00 – 14:00**

Module 3: Life Assessment of Steam Turbines – Examples

Prof F Masuyama,
Kyushu Institute of Technology (EX-MHI),
Japan

**1 hr 40 min:** 15:00 – 17:00 (with 20 minutes break)

**Specific topics will include:**

- Life Assessment of Rotors.
- Life Assessment of Casings.

**Coffee Break 16:00 – 16:20**
**Speaker’s Profile**

**Professor Masuyama** has been teaching and conducting research in Kyushu Institute of Technology, Japan, in Mechanical retiring from Mitsubishi Heavy Industries. He has about 40-year experience in materials science, mechanical/physical metallurgy, corrosion science, joining, and boiler and pressure vessel technology. His experience and expertise traverse both materials technology and fabrication technology for non-nuclear and nuclear heat exchanger and pressure vessel.

Prof Masuyama is the inventor of Grades 23, 122, HCM9M, and HCM12, and has been instrumental in the commercial application of Grades P91, P92 and under-developing P93 in the ultra-super critical power plants.

**Education:** Fujimitsu Masuyama received PhD from Osaka University, Japan.

**Dr Robertson** gained his qualifications in metallurgy and materials at Imperial College, London. He has over twenty years experience of materials used in the 2004, Dr. Robertson has been working for ETD Consulting on projects related to high-temperature plant integrity and life assessment, materials and welding issues, and root cause failure analysis. Through his work, Dr. Robertson has gained extensive experience of the materials used and damage/failure mechanisms in high-temperature plants.

Dr Robertson also has considerable experience in examination and interpretation of metallographic replicas in order to assess metallurgical damage and degradation (creep cavitation, spherodisation, etc.). He has been coordinating the ‘International P91 Users Group’ since it was formed by ETD in 2006 to better inform international industry about the issues related to use of grade 91 steel and its life assessment. Dr Robertson was also leader of the team that developed ETD’s now well known ‘e-Lifting’ procedure for the life assessment of all parts of conventional power plants and HRSGs.

**Mr. Alexandros Antonatos** has over 20 years work experience ranging from Laboratory Testing (Metallography and Failure Analysis) to on site Project Management in the field of Inspections. He has worked mostly in Fossil Fired Power Plants, HRSG’s and CCGT’s dealing with the implementation of NDT and Replication Programs and applying repair solutions to welds. He has field experience in P91 and dissimilar welding issues and excellent exposure to creep assessment for various high alloy steels (X20, 10Cr, etc.). He is Metallurgy and Mining Engineer and holds MBA. He is member of AWS, ASM, TWI (SenMWeldI) and CEng.
REGISTRATION

You can register yourself or your colleague via sending this form to Mrs. Elżbieta Wiśniewska: elzbieta.wisniewska@mazurenergy.pl; phone: +48 516 282 014

Courses remain open until such time as all places have been filled!

REGISTRATION FEE

| Power Plant – Boilers & Steam Turbines Remaining Life Assessment (23 – 24th of May) | *720 euro |

*Registration fee includes room with breakfast (1night: 23-24 May), coffee breaks, lunch, one dinner (23.05.), training course materials. *To above registration fee please add 23% Tax (VAT): Payment to 13th of May: 885,60 EUR gross

DELEGATES DETAILS

First Name: .................................................. Surname..................................................
Email: ........................................................... Telephone:.............................................
Company: ..................................................... Address:...................................................
City: ............................................................. Country:..................................................
Tax Identification Number of Company: ..............................................................................

• Please pay to this account in EUR before the date of Training Course (20.05.16):
  PL34 1030 0019 0109 7806 0105 7934 (CITI HANDLOWY WARSAW)
  SWIFT: CITIPLPX

• Please send the completed filled registration form to the e-mail address: elzbieta.wisniewska@mazurenergy.pl or by post office at the following address: Mazur Energy Sp. z o.o., ul. Ks. N. Bończyka 11-13, 51-138 Wrocław, Poland

We authorize Mazur Energy Sp. z o.o. to issue the invoice without the recipient’s signature. The submission of this data is voluntary, but necessary in order to enter you on the list of conference participants.

Date: .......................................................... Director / Financial Controller