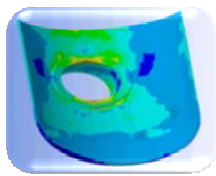




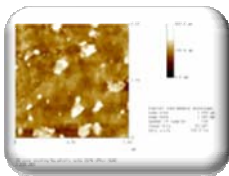
## ETD Newsletter , June 2010 (Issue 5)

*"Highly innovative engineering and consulting company engaged in providing services to the power plant, petrochemical, refining and other industrial sectors - backed up with state-of-the-art collaborative R&D and product development"*

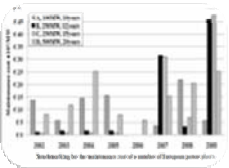
### Sections



1. Plant Integrity



2. Plant Services



3. Collaborative R&D / Technology Development



4. Training & technology Transfer

## Welcome to the June edition of ETD's newsletter

ETD continues to provide dynamic consultancy and industry leading projects through 2010. We are pleased to announce the release of our compendium of Lifting Procedures for steam power plant & HRSGs called 'e-Lifting'. The compendium and associated software took a dedicated team of ETD staff and international consultants / experts from Europe and Japan over two years to complete, and based on the feedback from the original industrial sponsors we are proud to see our efforts so well received.

Along with our ongoing projects, we are also pleased to highlight our new on-site services, including an industry first which can be read on page 3.

Kind Regards

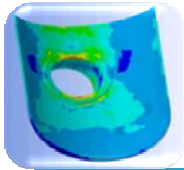
ETD team

### **Product Spotlight: e-Lifting**

*'Life assessment procedure and software for power plants'*

The development of this international industry sponsored deterministic and probabilistic state-of-the-art 1300 pages long procedure and the associated interactive software (with life calculation facilities etc.) dealing both with the conventional power plants and the HRSG has now been completed and is available for purchase

For further information: [www.etc1.co.uk](http://www.etc1.co.uk)  
Or contact Sean Hampson at [shampson@etc1.co.uk](mailto:shampson@etc1.co.uk)



## 1. Plant Integrity- Remaining Life Assessment Focus

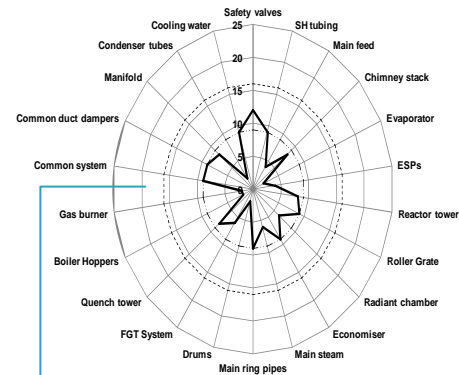
### Consultancy during 2010 includes the following:

Advice and guidance on *Plant Cycling, 2-Shifting and Load Following Operation* or improvement in the design and maintenance for such an operation and *cost modelling* related to the damage caused by such an operation.

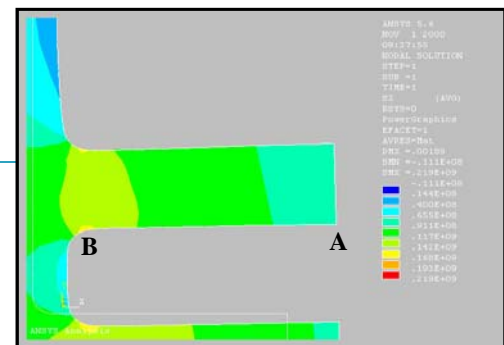
- *Risk-Based Maintenance* is becoming a popular topic with many of our clients. As ETD has developed its own Procedure & Software '*Riskfit*' with templates for all plant components (boilers, turbines, electricals etc.) this means that many clients world over can now benefit from this support which is fast, very effective and affordable. The unique feature of Riskfit is that it does not only cover the technical aspects but can also deal with human resource development, training, social and cultural aspects of plant.
- Our consultancy also includes services such as *inspection* and *outage planning*.
- *Benchmarking* is another area where ETD expertise is now well established and during 2009 we have carried out this work for about 90 European and North American plants. This was in addition to a multi-client Group Sponsored Project (see later) on this topic that ETD has started recently and which is studying about 100 plants from many countries.

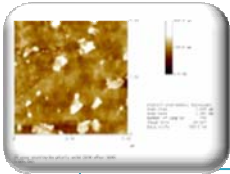
### The other specialist areas for ETD consultancy are:

- *Crack Assessment* both at low and high temperature using ETD's own procedure and software '*Crackfit*'.
- *Fitness-for-Service* both for petrochemical and plant power.
- *Failure analysis* of industrial components.
- *HRSG design* and operational issues.
- *Probabilistic Assessment* of Catalytic Reformer Process Lines for a UK refinery was carried out recently. ETD has developed this as one of its specialist areas saving money to both petrochemical and power industry.



Risk Based Maintenance: Implementation Programme Risk Assessment of Boilers and their attributes





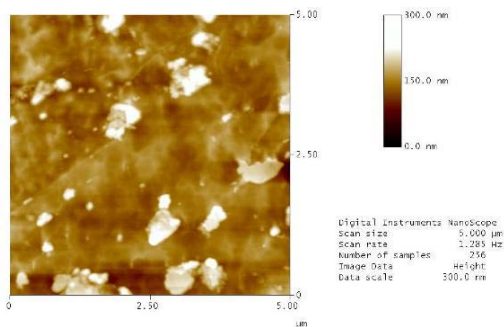
## 2. Plant Services Focus

At the start of the year ETD announced its **on-site life assessment capabilities** including replication, hardness testing and metallography. This service is complimentary to our *plant integrity and life assessment services* in general and our other capabilities and utilises the extensive knowledge and experience of ETD's in-house and international technical experts. ETD specialists have the expertise to analyse the component condition by means of replication and hardness values. Combining NDE with other remaining life assessment techniques (both deterministic and probabilistic) to provide the client with most reliable assessment of component life.

### **\*Industry First\*** **On-site powerful microscopy**

As a part of its excellence in innovation, ETD has now introduced an industry first- its on-site Scanning or Atomic Force Microscopy services which gives instant results of a component's level of damage in terms of, for example, creep cavitation 'area' or 'volume' and detect *nano* level creep, fatigue, corrosion etc. damage and precipitates, thus enabling us to detect and quantify damage, for example, in P91, P92 components and predict their life at a much earlier stage than has been possible so far.

For further details please contact us.



30 secs etching by picric acid (SAFM after SEM)  
3-151-002

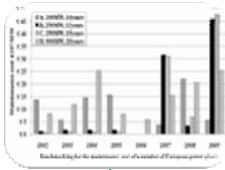


Preparation for on-site replication

### **Plant Life Assessment/ Extension**

We carry out complete plant life assessment for power, petrochemical, refining, fertiliser and other such plants using Level 1, Level 2, Level 3 type approach. We can use the local NDE teams or organise a UK/ European NDE inspection team using more sophisticated methods such as advanced ultrasonic techniques, boroscopy etc., if needed. We carry out stress analysis, FE analysis, Fitness-for-Service, and both deterministic and less conservative or more realistic probabilistic life assessment of more critical components. We can advise on suitable plant monitoring techniques, plant repair methodologies and component replacement strategy if required.

**In brief, we offer a one-stop shop for plant integrity and life assessment of ageing plant**



## 3. Collaborative R&D / Technology Development

### Group Sponsored Projects

These are the most popular and economical projects for industry involvement.- each project sponsor only pays a fraction of the total project cost but benefits from the full results. And yet the responsibility for the deliverables lies with one organisation (ETD) This is why many of our clients are repeat customers. These are usually plant owners/ operators, manufacturers or service providers. The projects can be joined at any stage of their execution although those who join early have more opportunities for making sure that the project deliverables are more relevant to their needs.

#### \*NEW\* - Weld Repair Review and Guidelines

This now on-going project considers all type of weld repairs (such as cold or hot weld repairs) and their behaviour and endurance in high temperature plant. Materials included in the study are: 2.25Cr1Mo, 0.5CrMoV, 316SS, P91, 1CrMo forged for rotors and 1CrMo cast for turbine casings.

#### \*NEW\* - Benchmarking project

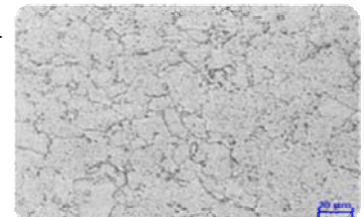
Over 100 power plants from SA, far east, North America, & Europe will be analysed in terms of power plant characteristics, operation, company staff, breakdowns/overhauls, maintenance, plant reliability & availability. In addition to the final report, for each utility (sponsor) a report on the comparison of their plant performance with those of others and with the best performing plant will be issued separately. All data is being treated in confidence and analysed and produced anonymously.

#### \*NEW\* -e-Lifing of Petrochemical, Process & Refining Plant

This project has just been started and is envisaged to be completed before the end of 2010. It will build up on a similar procedure already developed by ETD for Power Plant which has been much appreciated by its industry sponsors (see below) both as a lifing procedure and as a training tool.

#### Currently Running and still available to join:

- e-Atlas of In-Service Microstructure Degradation
- Technical and Cost Analysis of Component Replacement in Ageing Plant
- Materials & Data Review
- Riskfit - ETD's Risk based maintenance software
- P91 Welded Components: Inspection, Monitoring, Integrity and Life Assessment
- Damage to Power Plant due to Cyclic Operation and Guidelines for Best Practices - Technical & Cost Issues
- Damage to CCGT Due to Cycling- Technical, Cost Issues & Plant Performance
- O / CCGT & CHP Plants – Plant Performance including Cost Analysis



Superheater component microstructure



Risk 'waterfall' concept



## 4. Training & Technology Transfer

### CONFERENCE

3-Days 5<sup>th</sup> International HIDA Conference - HIDA-5 (23-25 June 10, UK), University of Surrey, Guildford, UK

The *HIDA series of conferences*, started in April 1998, have now become a regular event aimed at addressing plant integrity both in the defect-containing and defect-free components of high temp. plant. HIDA-5 has been expanded to cover failure analysis, fitness-for-service, preventive/ risk based maintenance and *probabilistic assessment*.

### TRAINING

2-Days LMF3 Training Course in Defect Assessment (21-22 June 10), University of Surrey- precedes the HIDA conference.

This is a popular repeat course and covers the fundamentals of damage and fracture mechanics and their application in high temperature plant for the assessment of crack initiation and growth

Details at: [www.hida5.com](http://www.hida5.com)

### TRAINING

4-days Training Course in Gas Turbine Component Failure and Lifting (October 2010), *IOM3, central London*.

This is a repeat course which has been highly appreciated by the previous attendees. During this course ETD experts from UK, Germany and Japan will cover the principles of Gas Turbine Design, Operation and CCGT Thermodynamics. Other issues to be discussed include: Materials and their selection; Component degradation, failure and root cause analysis (especially rotating parts); Integrity/ lifting of turbine blades and coatings; Hot gas path component life calculations, stress analysis, Finite Element Tools etc. including Worked Examples

### TRAINING

P91, P23 Courses and Industry Seminars in Houston, Texas (July 2010) and in Sydney, Australia (November 2010)

For information and programmes please visit ETD website [www.etc1.co.uk](http://www.etc1.co.uk)



#### Further information

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