

Consulting Services

ETD

Consulting

Plant Integrity &
Life Assessment
Worldwide

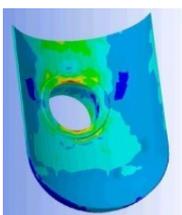
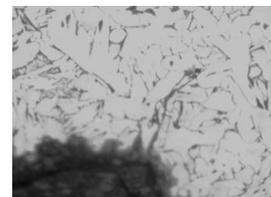
Power & Process Plant • Plant Integrity • Plant Services • Training • R&D

ETD Consulting is highly accomplished in several different areas of work. The services that we offer include:

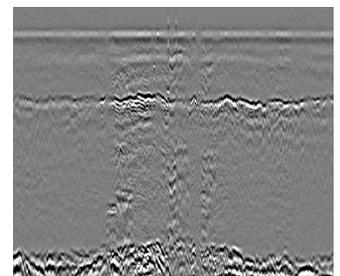
- **Advanced Materials (P91, P92, P23 & P24 Steels)** - ETD Consulting offers a comprehensive CSEF asset management program to optimize service life and minimise any future problems.
- **Boiler Tube Assessment** - ETD Consulting offer Boiler tubing assessments that characterise tube conditions and predict future serviceability - the cornerstone of a successful boiler tube failure reduction program. ETD has formulated it's own guidelines in collaboration with international industries.

Combined Cycle / HRSG Consulting & Engineering - Combined-cycle/heat recovery steam generator (HRSG) units lead a life complicated by rapid starts, thermal transients, cycle chemistry issues, and improperly designed attemperator systems. ETD Consulting can help clients deal with the resulting tube failures, flow-accelerated corrosion, piping expansion damage, weld cracks, and other consequences as well as training to improve the plant performance.

- **Defect Assessment** - ETD Consulting is internationally recognised in the field of defect/crack assessment both at ambient and elevated temperatures. Indeed ETD's scientists and engineers had, some years ago, led the European team of researchers to develop the well known HIDA procedure (High-temperature Defect Assessment) which was aimed at harmonising and bringing together British, German and French defect assessment procedures.
- **Failure Analysis** - ETD Consulting offers a comprehensive failure analysis service aimed at the identification of the damage and failure mechanisms (creep, fatigue, corrosion, metal dusting etc.), diagnosis of the root cause of failure, and making recommendations that will minimise the risk of repeat failures.



- **Finite Element & Stress Analysis** - ETD Consulting offers in-house finite element (FE) modelling of plant components. FE modelling can help in a number of circumstances - at the design phase, when looking for stress concentrations and deciding the placement of welds.
- **Fitness for Service** - ETD Consulting assesses the fitness for service of plant components and material under operating conditions, which can confirm that a material or component is safe to use, give advanced warning of in-service failures and resolve disputes between suppliers and operators.
- **On-Line Monitoring** - ETD Consulting's On-line monitoring represents an economic means of practically assessing the true condition of plant or equipment in-service.



ToFD image showing indication

For more information about ETD's Consulting Services, Please turn over.

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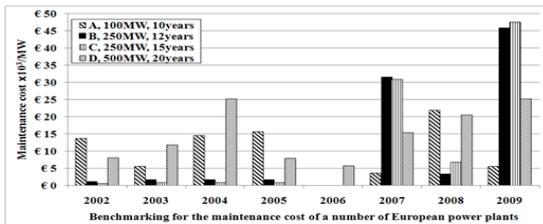
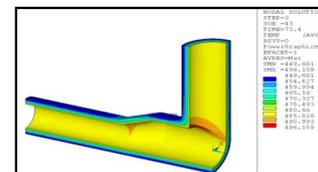
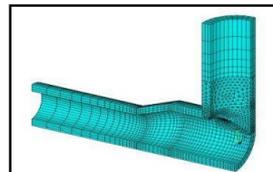
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Plant Integrity & Life Assessment Worldwide

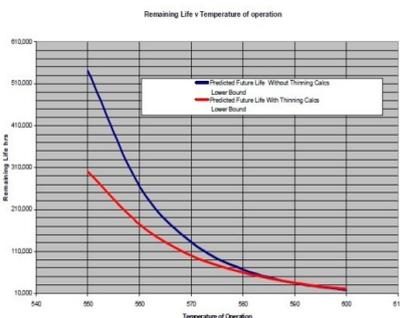
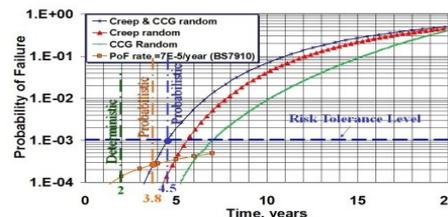
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- **Plant / Asset Integrity** - ETD Consulting's Asset Integrity Services assist clients in making informed decisions on the operation and maintenance of their plant and to manage the risks their operations place upon the assets they own or operate.

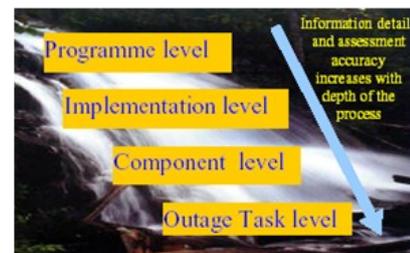


- **Plant Benchmarking** - ETD Consulting has developed flexible procedures, tools and techniques for measuring plant performance, so we can compare the performance of our clients' units to that of others and identify "top of the class" performance standards for their peer groups.

- **Stress Analysis** - ETD Consulting has extensive experience in the field of performing remaining life assessment of steam pipelines at power, petrochemical and refinery plants.
- **Probabilistic Life Assessment** - ETD Consulting provide realistic estimates of component remaining life. Our probabilistic life assessment methodologies provide more accurate results than the more commonly used deterministic life assessments.



- **Life Assessment & Extension** - ETD Consulting has Established expertise in the life assessment of components from petrochemical and power plants operating in the creep regime.



- **Risk Based Maintenance** - ETD Consulting developed, initially in collaboration with its North American partners, a Risk Based Maintenance (RBM) procedure known as 'Riskfit'. The main objective of 'Riskfit' is to allow a framework to identify and measure the risk areas and thereby allow the optimised focusing of available resources.
- **Vendor Qualification** - Our Vendor Qualification service helps our clients focus on the complete elimination of any deficiencies in either design, manufacturing or processing, so that when equipment begins service plant owners and operators can have confidence that the material will perform as intended by the design.
- **Other Specialist Services** - ETD Consulting has experience with many other aspects of high temperature plant design, operation and maintenance such as water chemistry and weld repair. ETD also provides training courses and organises international conferences on all high temperature plant subjects.

For more information on our consulting services, please visit www.etd-consulting.com/consulting-services

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