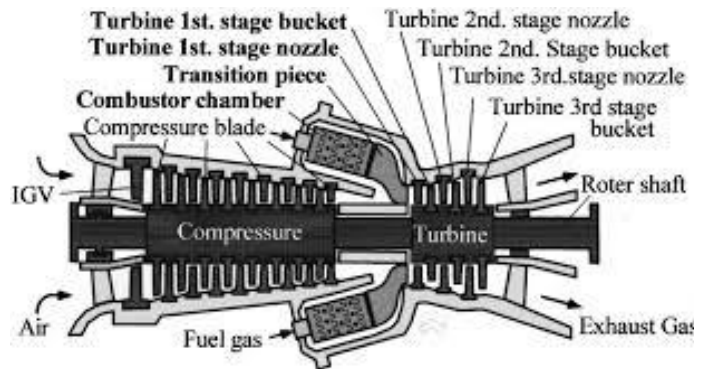
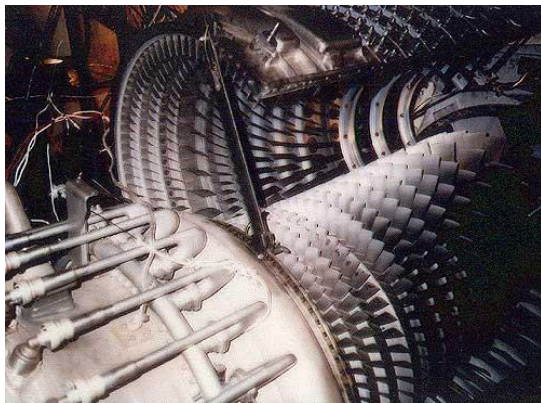


4-Days fully interactive on-line **GAS TURBINE** Training Course

Materials Selection, Design, Materials Degradation, Coatings, Repair, Operation and Life Extension

Dates: 15-18 March 2021

This is the 6th Gas Turbine Training Course being organised by ETD in the last some years. The past courses were held in London, Middle East and the USA. Delegates will be provided with electronic copies of the course presentations in advance and will have the opportunity to submit questions for discussion during the course.



Note: This year ETD has successfully organised on-line fully interactive Webinars, Training Courses and even a 2-days International Conference in October with 80 attendees and 36 presenters, all using 'Zoom'. During this difficult Covid-19 period this has become the 'new normal'. So, you can now attend these events from the comfort of your home. **Prior to the event practice runs can be organised for the attendees to ensure smooth running of the course.**

DAY- 1 (Mon. 15th)

Materials Type and Selection

0800-1130h (London time)

(Three one-hour sessions with two 15 minutes breaks after the first and the second sessions)

Prof Dr Yomei Yoshioka, Japan

Following topics will be covered:

- Typical materials for current GTs, metallurgical background, and recent developments.
- Component design requirements and material selection.
- Basic principles of superalloy and coating design and process.
- Solution and precipitation heat treatment and over-ageing.
- Polycrystal, directionally solidified and single crystal alloys.

DAY- 2 (Tues. 16th)

Prof Dr Yomei Yoshioka, Japan

Material Degradation, Life Assessment/ Extension and Repair

0800-1130h (London time)

(Three one-hour sessions with two 15 minutes breaks after the first and the second sessions)

The following topics will be covered:

- Analytical and condition-based life assessment of GT blades and metallurgical evaluation methods and applications.
- Material degradation due to creep, fatigue and oxidation.
- Microstructure analyses for components metal temperature, strength and creep life.
- Components damage and coating life aspects.
- Aspects of repair of hot gas path components.
- Life extension of GT blades.

DAY- 3 (Wed. 17th)

Gas Turbine Operation and Service Life Aspects, Case Studies

0800-1130h (London time)

(Three one-hour sessions with two 15 minutes breaks after the first and the second sessions)

Prof Dr Uwe Gampe, Germany

- Interaction of cyclic mechanical and thermal loading and its impact on service life of hot gas path components
- Effect of non-uniform gas temperature distribution at turbine inlet on service life
- Evaluation of turbine inlet temperature based on measured exhaust gas temperature
- Calculation of Equivalent Operating Hours (EOH) – case study
- Workshop with joint discussion of three case studies on damage and the approach to RCA

DAY- 4 (Thurs. 18th)

Gas Turbine Operation, Operational Safety, Case Study

0800-1130h (London time)

(Three one-hour sessions with two 15 minutes breaks after the first and the second sessions)

Prof Dr Uwe Gampe, Germany

- Power augmentation of gas turbines by high fogging (wet compression) and evaporation cooling – effect on operational behaviour and performance
- Relevance of fully functional overspeed protection – case study of an overspeed failure of an aeroderivative gas turbine
- Aspects of hydrogen co-combustion in gas turbines

COURSE PRESENTERS

Prof. Yomei Yoshioka was Chief Engineer at the Power Systems Co., Toshiba Corporation, Yokohama, Japan, and has over 40 years of experience working in the gas turbine industry. He has been investigating material deterioration and damage of actual gas turbine parts and developing evaluation technology and life extension technology through joint researches with Japanese electric power companies or an overseas gas turbine manufacturer, whereas developing superalloys through Japanese national projects. He has recently moved to academia and is currently Professor at the Tohoku University, Sendai, Japan, where he lectures on GT issues.

Prof. Yoshioka also works as a Consultant with ETD and Japanese industry on GT issues and has delivered these courses for ETD for many years in the Middle East, Europe, and North America.



Prof. Yoshioka

=====

Prof. Dr. Uwe Gampe of the Technische Universität Dresden, Germany, has 20 years of experience of working at the university on R&D and consulting projects for gas turbine industry. He is permanent guest of the Technical Group *Gas turbines and Gas Turbine Operation* of the International Association of Power Plant Operators VGB PowerTech since 15 years. His research team is member of the Rolls-Royce University Technology Centre *Lightweight Structures and Materials, Robust Design*.

Prof Gampe joined the university after many years of experience in the power plant industry and as Technical Director of an inspection, testing and engineering company.



Prof. Dr. Gampe

ABOUT THE ORGANISER

European Technology Development Ltd. (ETD), UK

ETD is a UK based engineering and consulting company specialising in life assessment/ extension, maintenance, materials and engineering issues in all types of power generating and process plant.

In addition to its *main business of technical consulting, plant inspection and their condition and life assessment*, ETD regularly organises training courses in power, petrochemical, oil, gas and other industrial sectors as a part of its programme on *technology transfer to industry worldwide*. In the recent past ETD has organised various international workshops/ courses/ conferences in the UK, a number of other European countries (Germany, France, Portugal), Middle East, Far East, South Asia, Canada and the USA. The issues involved in these courses covered GT hot gas path component lifing and failure analysis; HRSG design, maintenance and inspection; plant life assessment/ extension; high temperature plant materials behaviour; plant component safety and durability; performance of in-service welds and weld repairs; power plant cycling - technical and cost issues; boiler and turbine maintenance; petrochemical and refining plant issues; and, power plant bench marking for performance, and risk based maintenance and inspection (RBMI).

ETD's *consulting services* are backed-up by its *technology development and R&D programmes* in which ETD has been leading and co-ordinating a number of large leading edge international industry initiatives (supported by industry from North America, Japan, Europe and elsewhere, or by funding agencies such as the European Commission and the UK government). These have covered issues related to the assessment and improvement of high temperature plant performance, materials, plant design, and plant maintenance, repair, inspection and monitoring strategies. The company has also carried out or participated in leading edge projects on P91 weld repairs, crack assessment, plant integrity issues and has only recently carried out and concluded reviews of T/P23, T/P24 and P/T91 performance in power plants worldwide.

ETD has also prepared a number of guidelines and software packages for power plant boiler, HRSG and turbines operations, inspection, monitoring, assessment of cracks and component life in general.

For further information, please visit our website: www.etd-consulting.com

Or, write to: enquiries@etd-consulting.com

=====

REGISTRATION FORM (Please email)

Online LIVE GT Training Course

Materials Selection, Design, Materials Degradation, Coatings, Repair and Life Extension

GT
COURSE

Dates: 15 – 18 March 2021

Registration Fee: Covers delivery of the course & provision of presentations in pdf format (all fees shown are in GB Pounds). Please put 'x' in the relevant box and show the total payment.

| Reduced Fee (Until 15 Feb. 2021) | Full Fee (From 16 Feb. 2021) |
|---|--|
| £800 | £850 |
| Please show here (no. of attendees x £): Total Amount Payable = £ | |

How to Pay: When paying please quote reference 'GT Course' and the ETD invoice number (if this was issued):

1) By bank to bank transfer to: European Technology Development Ltd.

(ETD bank account details will be provided on request)

2) Credit Cards: Payment information will be provided on request.

When registering, please state here how you paid or intend to pay:

.....
.....

All Registration & Payment enquiries to: enquiries@etd-consulting.com

Attendee(s) Details

Your **title** and **name:**

Company:

Job Title (optional):

Address:

Phone:

E-mail:

Address for Registration:

Please email the required information/ completed form to: enquiries@etd-consulting.com

Gas Turbine Training Course