

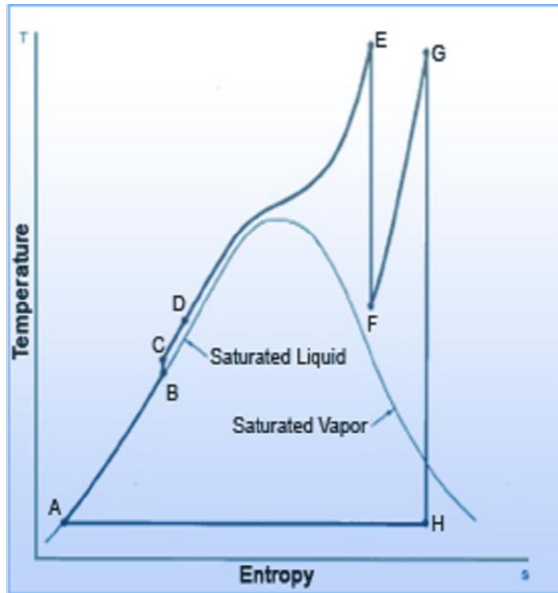


Engineering Staff College of India  
Autonomous Organ of The Institution of Engineers (India)

Old Bombay Road, Gachi Bowli, Hyderabad – 500 032. TS, India



**POWER & ENERGY DIVISION**



*Continuing Professional Development Programme on*  
**Best Practices in O&M of Super Critical Thermal Plants**

14 – 16 March, 2017



(An ISO 9001:2008 Certified, AICTE & CEA Recognized Institution)

**Centre for Promotion of Professional Excellence**

## **INTRODUCTION**

“Supercritical” is a thermodynamic expression describing the state of a substance where there is no clear a pressure above 22.1MPa. (Mega Pascal). Up to an operating pressure of around 19 MPa in the evaporator part of the boiler, the cycle is sub-critical. This means, that there is a non-homogeneous mixture of water and steam in the evaporator part of the boiler. In this case, a drum-type boiler is used because the steam needs to be separated from water in the drum of the boiler before it is superheated and led into the turbine. Above an operating pressure of 22.1 MPa in the evaporator part of the boiler, the cycle is supercritical. The cycle medium is a single-phase fluid with homogeneous properties and there is no need to separate steam from water in a drum. Once through boilers are therefore used in supercritical cycles.

Supercritical technology has evolved over the past 30 years. Advancements in metallurgy and design concepts have made supercritical technology units extremely reliable and highly efficient. Modern supercritical technology is largely available in Japan and Europe for Boilers & Turbines ranging upto 1000 MW. India is also making a dent in this field. This era is witnessing a trend in installation of 660/800 MW units in India with Supercritical technology to gain from the efficiency improvement associated with pollution abatement in energy conversion process with ultimate aim to phase out its sub-critical units in future.

Supercritical steam conditions improve the turbine cycle heat rate significantly over sub-critical steam conditions. The extent of improvement depends on the main steam and reheats steam temperature for the given supercritical pressure. A typical supercritical cycle having turbine throttle pressure of 242 bar with temperatures for main steam and reheat steam as 565<sup>0</sup>C and 593<sup>0</sup>C respectively, will improve station heat rate by more than 5%. This results in fuel savings to the extent of 5%. Overall supercritical power plant efficiency of 42% is achievable with current supercritical parameters.

As coal based power projects are expected to be main stay of Indian power sector in future. In its constant pursuit to serve as bridge between the industries and the academicians / professionals, ESCI (Hyderabad) is organizing a three day training programme on “**Best Practices in O&M of Super Critical Thermal Plants**” to sensitize power sector professional, with an in-depth knowledge in this cutting edge technology.

## **OBJECTIVE**

- To provide Awareness on the materials and technological O&M issues and challenges related to Supercritical / Ultra Supercritical (USC) / Advanced USC Power Plants
- To help participants understand the advantages and applications of this supercritical technology
- To make the participants to be aware of future scope and technological advancements required for indigenous development of this particular supercritical area including best practices

## **COURSE COVERAGE**

- Indian Power Sector Scenario – An Overall View
- Supercritical, Ultra Supercritical and Advanced USC Plants in India – The Present Scenario
- Salient Features of Supercritical Boilers & Turbines
- Boiler Water Chemistry and Chemical Cleaning Aspects
- Major Concerns with supercritical Technology

- Availability, Effective and Economy of Supercritical Units for Low Grade Coal
- SWOT Analysis of Super & Ultra Supercritical Plants
- Experience, O&M Issues and Challenges of Supercritical Technology Adaptation in India
- Best Practices
- Case Studies

### **METHODOLOGY**

The programme will be conducted in an interactive environment providing greater scope for discussions. Emphasis will be on a highly participative style of learning. The classrooms are provided with latest audio – visual teaching aids. The ambience in the campus and classrooms facilitate in effective learning by participants.

### **FACULTY**

Apart from Core Internal Faculty, Consulting Firms, Government Organisations, Manufacturing, Academic and Research Institutions etc. will share the sessions.

### **TARGET PARTICIPANTS**

Engineers / Executives / Managers of Power Utilities – Gencos / CPPs / IPPs / SEBs' / NTPC / R&D Units etc.

### **PROGRAMME VENUE, DATES & TIMINGS**

Engineering Staff College of India (ESCI) Campus, Old Bombay Road, Gachi Bowli, Hyderabad - 500032, Telangana, India.

### **DATES**

**14 – 16 March, 2017**

### **TIMINGS**

On the first day registration will commence at 0900 Hrs. On all other days the programme timings will be from 0945 to 1715 hrs with breaks in between for tea and lunch.

### **COURSE DIRECTOR**

**A Chandra Mohana Rao**

Head I/c & Sr. Faculty - Power & Energy Division, ESCI

### **COURSE FEE**

**Residential Fee** is Rs.15,000/- per participant. Residential fee includes Course Material, Course Kit, and Twin-sharing / Single AC accommodation as per availability, Breakfast, Lunch, Dinner, Tea / Coffee and Snacks.

### **DISCOUNTS**

**Non-Residential Fee:** 10% discount on course fee is allowed for non-residential participants.

**Group Discount:** 10% discount for three or more participants if sponsored by the same organization.

**(All discounts are applicable only if fee is received at ESCI a week before the commencement of the programme)**

**Service Tax @ 15%** is to be paid extra over and above the training fee. ESCI's **Service Tax Registration No** AAATT3439QST008 (under commercial training or coaching services – clause 65(105) (ZC) of Finance act – 1994). **PAN Card No.** AAATT3439Q;

The course fee is to be paid in favour of “**IE (I) – ENGINEERING STAFF COLLEGE OF INDIA**” in the form of demand draft payable at Hyderabad.

Alternatively the payment may be made by **Electronic Fund Transfer (EFT) to ESCI – SB A/c No. 10007111201** with The SBI, PBB Rajbhavan Road Branch, Khairatabad, Hyderabad – 500 004 by **NEFT / RTGS / IFSC Code No: SBIN 0004159 – MICR No: 500002075**. While using EFT method of payment, please ensure to communicate us your company name, ESCI invoice reference and programme title.

Online registration is available on ESCI website. To register, manually please send your nominations (**10 days** prior to date of commencement of the programme) giving details of name, designation, contact address, email address, mobile number, telephone and fax number of the participant along with the details of mode of payment of fee, addressed to:

### **Head, Power & Energy Division**

Engineering Staff College of India

Gachi Bowli, Hyderabad – 500 032

Phone: 040 – 6555 3370 / 3371 / 3372; 040-2300 0465 / 0466, Fax: 040 - 23000336

Email:pe.esci@gmail.com / pe@escihyd.org; Website: www.escihyd.org

**CERTIFICATE:** A certificate of participation will be awarded to each participant on conclusion of the programme.

### **GENERAL INSTRUCTIONS**

- ESCI encourages participants to present case studies from their respective organizations.
- For the convenience of the outstation participants ESCI will facilitate pickup and drop from Airport / Railway Station / Bus Stations, if travel plans are received at least 3 days in advance along with mobile number by fax or email. The charges shall be paid by the participants directly to the cab driver.
- ESCI provides complimentary accommodation to participants a day prior to the commencement and after the conclusion of the programme. (Check in at 12:00 hrs a day prior to the commencement & check out at 12:00 hrs a day after completion of the programme)
- Overstay charges of @ Rs.990/- per day / per head including hospitality (Bed Tea / Coffee to Dinner) will be charged.
- Well developed Information Centre and Internet facilities are available to the participants free of cost.