



2nd Annual Conference on

# Flue Gas Desulphurisation Systems

November 27, 2018

Le-Meridien, New Delhi

4th Annual Conference on

# O&M of Coal-based Power Plants

November 28, 2018

Le-Meridien, New Delhi

Co-sponsors:



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# FLUE GAS DESULPHURISATION SYSTEMS

## Mission

- Cleaning up India's coal-based power generation fleet has been an important part of the policy agenda, driven by India's national commitments to reduce its carbon emissions.
- One of the concrete measures in this direction in the recent past has been the issuance of stringent emission standards for thermal power plants to limit major pollutants such as sulphur dioxides. According to the government's estimates, of India's huge coal-based capacity, nearly 161 GW is currently non-compliant with SO<sub>x</sub> emission norms. The installation of FGD technology that captures SO<sub>x</sub> emissions has thus become a key imperative for such plants.
- A number of enabling measures have been taken to ensure that power plants are able to realistically implement the new norms. A phased plan for FGD technology installation has been prepared by the government, wherein 414 units have been earmarked for FGD installation starting 2018 up till 2022. So far, while FGDs have been commissioned for three units, tenders have been issued/awarded for a significant number of projects across the central, state and private sectors. As per the plan, about 350 units are expected to complete the installation by 2021 and 2022.
- More recently, in a major relief to thermal power stations, the government notified that investments in the installation of emission control technologies such as FGD would be considered for a pass-through in tariffs. Clarity on the pass-through of such additional costs has been a positive development as the resolution of the issue of cost recovery had been dragging on for long.
- That said, a major challenge for plant owners is the choice of FGD technology, given various considerations such as technical factors, the required shutdown periods, coal quality and its sulphur content, O&M costs, and water usage.
- By far, the most mature technology is wet scrubbers. These have demonstrated high SO<sub>x</sub> removal efficiency and relatively low auxiliary consumption, even though their water requirement and capital costs are higher. Based on plant location, seawater FGD systems have also been deployed in select coastal power stations in India.
- Circulating-dry scrubbers or dry scrubbers are an alternative FGD technology that significantly lowers water usage and has significantly lower capital costs. Besides, its space requirement is much lower and it can thus be considered for older plants and units with lower ratings. However, dry scrubbers are disadvantaged by higher power consumption and higher maintenance costs. The limited use of by-products (gypsum) generated by a dry FGD system is another constraint, as opposed to a wet FGD system where the by-product is of a saleable grade.
- Apart from water consumption requirements, FGD wastewater is another aspect that plant owners need to look into. Wastewater from FGD systems typically requires treatment for disposal. Strict environment regulations often call for zero liquid discharge, which is complicated and costly.
- **The mission of this conference is to provide a platform to discuss the needs, benefits and drivers as well as the issues and challenges associated with FGD technology for power plants. It will also showcase the latest innovations and most promising and relevant technologies.**

## Target Audience

- The event is expected to draw participation from executives, managers and decision-makers from:
  - Power plants
  - State gencos
  - Other industrial plants
  - Pollution control boards
  - Government and regulatory agencies
  - Research and development organisations
  - FGD Technology providers
  - Consultancy organisations
  - Environmental firms, etc.

## Organisers

The conferences on Flue Gas Desulphurisation Systems and O&M of Coal-based Power Plants are being organised by **India Infrastructure Publishing**, the leading provider of information on the infrastructure sectors through magazines, newsletters, reports and conferences. The company publishes **Power Line** (India's premier power magazine), **Smart Utilities**, **Indian Infrastructure** and **Renewable Watch** magazines. It also publishes a series of reports on the energy sector, including **Coal in India**, **Coal-based Power Generation**, **Indian Power Sector and Equipment Market Outlook**, and **Captive Power in India**. It also publishes the **Power Line Directory** and **Yearbook**.

## AGENDA/STRUCTURE

### KEY TRENDS AND OUTLOOK

- ❖ What is the current SO<sub>x</sub>-compliant and non-compliant coal-based capacity?
- ❖ What are the timelines proposed for implementing the emission norms?
- ❖ What have been the recent policy and industry developments? What are the major issues and concerns?

### EMISSION NORMS UPDATE

- ❖ What is the status of compliance with SO<sub>x</sub> norms?
- ❖ What is the expected impact of the pass-through of costs incurred on emission control equipment?
- ❖ What are the realistic timelines for enabling plants to meet the revised norms?

### GOVERNMENT PERSPECTIVE

- ❖ What is the government's perspective on the emission norms?
- ❖ What has been the progress in the implementation of the FGD roadmap so far?
- ❖ What are the proposed next steps to expedite compliance?

### GENCO PERSPECTIVE

- ❖ What has been the progress in FGD implementation so far?
- ❖ What are the genco's plans and targets for FGD installation?
- ❖ What are the key issues and concerns? What are the genco's policy and industry expectations?

### INDUSTRY PERSPECTIVE

- ❖ What has been the trend in FGD orders booked so far?
- ❖ What is the expected market volume for FGD orders in the short to medium term?
- ❖ What are the key issues, concerns and challenges for vendors and solution providers?

### FGD TECHNOLOGY OPTIONS

- ❖ What are the various technology options for SO<sub>x</sub> emission control?
- ❖ What is the efficiency level of various options (wet, dry, seawater, etc.)?
- ❖ What are the new and emerging technologies and solutions?

### DESIGN AND ENGINEERING

- ❖ What are the design and operating considerations for FGD systems?
- ❖ What are the civil and mechanical works associated with a typical FGD system installation?
- ❖ What are the space, auxiliary system and shutdown period requirements associated with FGD?

### RAW MATERIAL AND BY-PRODUCTS

- ❖ What are the raw materials required for FGD systems and their suitability for domestic coal-based plants?
- ❖ What are the costs associated with the transport, storage and handling of feedstock?
- ❖ What are the key areas of concern associated with the procurement of raw materials and disposal of by-products?

### FGD WASTEWATER

- ❖ What is the typical quantity and quality of wastewater generated by power plants?
- ❖ What are the requirements and challenges of wastewater treatment for FGD plants?
- ❖ What are the technology options and solutions to address the issues?

### COST ECONOMICS AND FINANCING

- ❖ What are the capex estimates of FGD plants based on various technologies?
- ❖ What is the break-up of O&M costs associated with various packages?
- ❖ What are the financing-related challenges in the backdrop of financially stressed thermal projects?

### Previous participants

The participants in our previous conference include Aditya Birla Management Corporation, Aerzen Machines India, Amines & Plasticizers, Arudra Engineers, Beijing SPC Environment, Bharat Heavy Electricals, BTL EPC, Bygging India, Center for Fly Ash Research & Management, Central Electricity Authority, Chemical Process Piping, Chhattisgarh State Power Generation Co., Chhattisgarh State Power Generation Company, Coastal Gujarat Power, Cottagon S.A., Damodar Valley Corporation, DB Power, Demech Chemical Products, EagleBurgmann India, Edelweiss Asset Reconstruction Company, Forbes Marshall, Furnace Fabrica (India), GSECL, H2L-Vedanta, Haryana Power Generation Corporation, HEG, Hindustan Petroleum Corporation, Hindustan Zinc, ICRA, J.K. White Cement Works Division, Jaiprakash Associates, Jay Pee Power Projects (Jai Prakash Power Ventures), Jindal Power, JK Cement, KSB Pumps, Maco Corporation (India), Maharashtra State Power Generation Co. Ltd, Maithon Power, MEG, Ministry of Power, MSEB Holding Company, National Fertilizers, NLC India Limited, NTPC, Odisha Electricity Regulatory Commission, Organo Corporation, Outokumpu India Private, Paramount, PTPS, HPGCL, RRWNL, Rudis LLC Trbovje, Simona India, SKI Carbon Black (India) Private, SPC Environment Protection Tech, SRF, Stalwart Advisors, Sulzer Pumps India, Tata Consulting Engineers, Technical Drying Services (Asia), The Tata Power Company, Weir Minerals India, West Bengal Power Development Corporation, Yantra Harvest, etc.

# O&M OF COAL-BASED POWER PLANTS

## Mission

- Power plant owners and managers are gearing up to meet new challenges in a rapidly changing market and taking a relook at their traditional O&M practices.
- While modern, more efficient coal-based power plants are being built, the existing but less efficient older thermal power plants still constitute the bulk of the baseload. Thus, improving the capacity utilisation, reliability, flexibility and efficiency of the existing fleet while ensuring competitiveness are becoming priority areas in O&M strategies.
- Greater renewables influx is driving a number of thermal power plants (TPPs) to become more flexible in order to ensure reliable and quality power supply as well as their commercial viability. Cyclic operations due to flexibilisation however pose greater O&M challenges such as reduced efficiency, higher maintenance, lower equipment lifetime, and need to be managed effectively.
- Besides addressing dynamic demand requirements, for BTG equipment, there is an emphasis on improving combustion efficiencies, increasing the planned service life and minimising equipment stress and shutdowns. Online software, IoT, data and analytics, remote monitoring solutions and modern C&I systems are being deployed to guide operators on plant parameters and their adherence to design values.
- Much of the investments and initiatives in energy efficiency improvements for TPPs are being prioritised by the industry under the multi-cycle PAT scheme, wherein more than 150 plants have been given specific heat rate reduction targets, depending upon the level of deviation from their design heat rates.
- Meanwhile, with coal quality issues still persisting and gencos looking at greater amounts of coal imports for blending in the short term, systems and practices need to be strengthened for coal handling, blending and beneficiation. Improper blending or failure of coal handling plant (CHP) equipment may lead to unplanned outages and loss of revenue for plant operators.
- Stricter regulations also call for enhancing ash utilisation levels by TPPs. Plant managers need to deploy effective O&M strategies considering the design and choice of ash handling systems that can enhance their efficiency. There is also an emphasis on reducing the water footprint and ensuring proper wastewater treatment to reduce vulnerability to future water scarcity.
- With increasingly complex operations, the enhancement of power plant safety is another area being addressed, not just in the design phase, but increasingly in the O&M phase as well. Preventive and predictive solutions and programmes are being increasingly leveraged to minimise faults and risks in assets.
- **The mission of this conference is to discuss and highlight new and promising O&M strategies for power plants. It will analyse new trends and emerging requirements for thermal power plants, flexibilisation needs and impact, focus on key equipment such as BTG, coal and ash handling systems and cooling towers, and highlight best practices in O&M. It will also provide a platform to showcase the most relevant technologies and solutions for O&M of power plants.**

## Target Audience

- The event is expected to draw participation from executives, managers and decision-makers from:
  - Coal-based power plants
  - Coal/ash handling equipment providers
  - Regulatory agencies
  - Captive power plants
  - Boiler manufacturers
  - Research and development organisations
  - Other power generators
  - Coal quality analysts
  - Environmental firms
  - SEBs and gencos
  - Technology providers
  - Energy efficiency consultants
  - Power plant O&M providers
  - Consultancy organisations
  - Certification and inspection companies, etc.



## AGENDA/STRUCTURE

### KEY TRENDS AND OUTLOOK FOR COAL-BASED POWER

- ❖ What has been the growth in installed coal-based power capacity?
- ❖ How has thermal power plant performance been?
- ❖ What have been the recent developments? What is the segment outlook?

### FOCUS ON FLEXIBILISATION

- ❖ What are the emerging O&M requirements for flexibilised plants?
- ❖ What is the impact of cycling operations on power plant performance?
- ❖ What are the new and emerging technologies and solutions?

### FOCUS ON BTG

- ❖ What are the O&M needs and requirements for BTG equipment?
- ❖ What are the key O&M-related challenges for BTG equipment?
- ❖ What are the new and emerging solutions available to cater to the new requirements?

### COAL QUALITY

- ❖ What are the key concerns with regard to coal quality?
- ❖ What are the cost benefits of using washed coal? What is the upcoming coal washing capacity in India?
- ❖ What are the key challenges in this regard?

### COAL HANDLING SYSTEMS

- ❖ What are the key O&M requirements for coal handling systems?
- ❖ What are the new and promising technologies and solutions?
- ❖ What has been the uptake by gencos? What are the issues and concerns?

### O&M BEST PRACTICES

- ❖ What are the current gaps in O&M practices of power plants?
- ❖ What are the best practices being adopted in India and globally?
- ❖ What has been the experience so far and the impact on power plant performance?

### ASH HANDLING AND MANAGEMENT

- ❖ What are the key O&M requirements for ash handling and management?
- ❖ What are the new and promising technologies and solutions?
- ❖ What has been the level of uptake by gencos? What are the issues and concerns?

### FOCUS ON TECHNOLOGY AND AUTOMATION

- ❖ What are the new technologies and solutions being offered by the industry for O&M?
- ❖ What are the outcomes achievable with these solutions?
- ❖ What has been the level of uptake of these solutions by gencos?

### WATER AND WASTEWATER MANAGEMENT

- ❖ What are the key issues and concerns with regard to water and wastewater management for TPPs?
- ❖ What are the O&M interventions required to optimise water consumption?
- ❖ What are the best practices being followed for wastewater management?

### ENERGY EFFICIENCY

- ❖ What have been the key interventions carried out for improving energy efficiency under the PAT scheme?
- ❖ What are the targets assigned for TPPs under future PAT cycles?
- ❖ What are the key issues and challenges being faced by TPPs in meeting their targets?

### FOCUS ON COOLING TOWERS

- ❖ What are the key O&M-related challenges with cooling towers?
- ❖ What are the new and promising technologies and solutions for O&M?
- ❖ What are the key issues and challenges in implementation?

### POWER PLANT SAFETY

- ❖ What are the key safety-related concerns involved in the O&M of power plants?
- ❖ What are the best practices in this regard?
- ❖ What are the new and emerging tools and solutions for improving plant safety?

### Previous participants

The participants in our previous conference include Accenture, Adani Mining, Aries Power Systems, Bevccon Wayors, BHEL, Black & Veatch, BSBK Engineering, Bureau of Energy Efficiency, Calderys India Refractories, Central Mine Planning & Design Institute, Centre For Fly Ash Research & Management, CESC, C-FARM, Dalmia Bharat Cement, Emta Coal, Essar Power, Essel Mining & Industries, FLSmidth Private, Gujarat State Electricity Corporation, Gulbarga Power, Haryana Power Generation Corporation, Indian Metals & Ferro Alloys, Jenissi Management Consultants, Jindal Power, Jindal Steel & Power, JK Tyre & Industries, KEPCO Plant Service & Engineering, KPCL, L&T-Sargent & Lundy, Lalitpur Power Generation (Bajaj Group), Lara Global, Larsen & Toubro Power Development, M.P. Power Generating Company, Macawber Beekay, MAHAGENCO, Maharashtra State Power Generation, Mahavir Beneficiation, McNally Bharat Engineering Company, Meenakshi Energy, Metso India Private, MGM Energy, NPTI, NTPC, Orient Cement, Panalytical India, PCP International, Perma Pure, PSPCL, Rattan India Power, Schneider Electric India Private, Sesa Sterlite, SKF, Spectris Technologies, SRF, Talwandi Sabo Power, Tata Power, Tata Steel, Techmark Engineers & Consultants, Tega Industries, Tenova India, The Energy and Resources, Thermax, Thriveni Earthmovers, Timken, UJVN, Vedanta, Vicat Sagar, Virginia Mining Resources, Weir Minerals, Western Coalfields, Wipro, etc.

# REGISTRATION FORM

- I would like to register for the “FLUE GAS DESULPHURISATION SYSTEMS” conference (November 27, 2018, Le-Meridien, New Delhi)
- I would like to register for the “O&M OF COAL-BASED POWER PLANTS” conference (November 28, 2018, Le-Meridien, New Delhi)
- I would like to register for **both the conferences**

I would like to register for the conference. I am enclosing Rs \_\_\_\_\_ vide cheque/demand draft no. \_\_\_\_\_ drawn on \_\_\_\_\_ dated \_\_\_\_\_ Company GST No. \_\_\_\_\_ in favour of India Infrastructure Publishing Pvt. Ltd. payable at New Delhi.

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## REGISTRATION FEE

### FLUE GAS DESULPHURISATION SYSTEMS OR O&M OF COAL-BASED POWER PLANTS

Delegates	Fee			Total USD
	INR	GST @18%	Total INR	
One delegate	16,000	2,880	18,880	315
Two delegates	28,000	5,040	33,040	551
Three delegates	40,000	7,200	47,200	787

### BOTH CONFERENCES

Delegates	Fee			Total USD
	INR	GST @18%	Total INR	
One delegate	25,000	4,500	29,500	492
Two delegates	40,000	7,200	47,200	787
Three delegates	55,000	9,900	64,900	1,082

### Terms and Conditions:

- There is a special low fee of Rs 3,000 per participant for state owned gencos, regulatory authorities, academic institutions and government agencies (not public sector corporates). The fee will be Rs 5,000 per participant for those attending both the conferences. *GST @ 18 per cent is applicable on the registration fee.*
- To register online, please log on to <http://indiainfrastructure.com/conf.html>

### Terms and Conditions:

- The conference is a non-residential programme
- Registration will be confirmed on receipt of the payment. Full payment must be received prior to the conference.
- Conference fee includes lunch, tea/coffee and conference materials.
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