



Conference on

# Flue Gas Desulphurisation Systems

Requirements & Challenges: Strategies & Solutions

December 18, 2017

Shangri-La's - Eros Hotel, New Delhi

3rd Annual Conference on

# O&M of Coal-based Power Plants

Emerging Requirements, Promising Technologies  
& Best Practices

December 19, 2017

Shangri-La's - Eros Hotel, New Delhi

Organisers:

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# FLUE GAS DESULPHURISATION SYSTEMS

## Mission

- To meet the COP21 commitment, new norms to restrict emissions from India's heavily polluting thermal power plants were put in place at the end of 2015. One of the key technologies that were selected for meeting these norms has been flue gas desulphurisation (FGD).
- Both existing and under-construction plants would be retrofitted or installed with FGD for controlling sulphur dioxide (SO<sub>2</sub>) emissions. Though popular worldwide, the adoption of FGD technology has been relatively low in India.
- However, the uptake of FGD is expected to increase significantly in the next few years. As per the Central Electricity Authority's (CEA) projections, half of the installed capacity in India, largely installed post 2008, would require FGD systems.
- The CEA, along with the regional power committees, has prepared region-wise implementation plans to install FGD systems in 122 GW of coal-based plants. The country-wide installation is expected to be completed by December 2023. At the same time, the CEA has identified 72 GW of plants that do not have space to install FGD systems and hence would be phased out.
- The equipment market has started witnessing a flurry of activity since the preparation of the phase-in plan. Major gencos such as NTPC have taken the lead by issuing bulk tenders for FGD. State utilities are expected to follow suit. Suppliers are also gearing up to meet future demand by offering customised solutions, technological tie-ups with global technology players, etc.
- That said, FGD systems are also one of the most expensive retrofits for pollution control. As per the CEA's estimates, the installation cost of wet limestone-based FGD is estimated at Rs 5 million per MW.
- The additional costs are expected to impact tariffs. Further, according to developers, the cost implications could be higher considering the losses on account of plant shutdown. Therefore, gencos require regulatory clarity on the recoverability of such costs from the discoms.
- Given the limited experience of the technology in the country, there is a need for greater clarity on the type of FGD (wet, dry, seawater) most suited for power plants in the country. While wet FGDs are known for their high efficiency, low operating costs and low auxiliary power consumption, factors such as project location, sulphur content in coal, and the availability and cost of reagent would also need to be examined.
- Another area of concern is the limited availability of high purity limestone, which is a key raw material for FGD. Further, there are concerns regarding the disposal of gypsum, a by-product of FGD systems, which is even more difficult than disposing fly ash due to the scarcity of land.
- The other big issue is with regard to land availability. FGD systems have significant space requirements. In power projects that were installed after 2005, there is a provision for the installation of FGDs. For the others, the technical feasibility needs to be examined.
- **The mission of this conference is to provide a platform to discuss the key requirements, issues and challenges associated with the installation of FGD technology in power plants in light of the new environmental norms. It will also showcase the latest innovations and the 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.

## AGENDA/STRUCTURE

### KEY TRENDS AND OUTLOOK

- ❖ What has been the growth of India's installed coal-based capacity?
- ❖ What is the current level of emissions from coal-based plants?
- ❖ What are the segment's key issues and concerns? What is the outlook?

### NEW ENVIRONMENT NORMS

- ❖ What would be the impacted capacity as a result of the new norms?
- ❖ What is the current compliance level with the SOx emission norms?
- ❖ What are the challenges in meeting the new norms?

### GOVERNMENT PERSPECTIVE

- ❖ What are the plans with regard to phased installation of FGD systems at existing and new units?
- ❖ What is the capacity identified for FGD installation? What are the timelines proposed?
- ❖ What has been the progress so far? What are the key issues and concerns?
- ❖ What are the next steps in this regard?

### GENCOS' PERSPECTIVE

- ❖ What is the current status of FGD installation by gencos? What are the future plans?
- ❖ What would be the capital costs and shutdown period required for FGD installation ?
- ❖ What are the expectations from suppliers?
- ❖ What are the biggest issues and concerns?

### INDUSTRY PERSPECTIVE

- ❖ What is the estimated market size for FGD over the new few years?
- ❖ What is the domestic manufacturing capacity available to cater to the FGD requirements?
- ❖ What are the plans of suppliers to meet future demand?
- ❖ What are their key issues and concerns?

### FGD ECONOMICS

- ❖ What are the costs and investments required for FGD installation?
- ❖ What would be the impact on tariffs? What are the current regulations regarding the pass-through of FGD costs?
- ❖ What are the key issues and concerns? What is the way forward?

### FOCUS ON WET FGD TECHNOLOGY

- ❖ What are the features of wet FGD systems? What are the advantages of wet FGD technology as compared to other options?
- ❖ What has been the experience of deploying such systems in India and globally? What are the cost and time requirements?
- ❖ What are the key issues and concerns of such technologies? What is the outlook?

### DRY FGD SYSTEMS

- ❖ What are the features, efficiencies achievable and costs associated with dry FGD systems?
- ❖ What has been the experience of deploying such systems in India and overseas?
- ❖ What are the key issues and concerns with respect to such systems? What is the outlook?

### REQUIREMENTS FOR COASTAL POWER PLANTS

- ❖ What are the FGD systems required for coastal plants? What are the features and performance levels of seawater FGDs?
- ❖ What has been the global experience of deploying such technologies?
- ❖ What are the key issues and concerns associated with such systems?

### DESIGN AND ENGINEERING

- ❖ What are the most promising FGD solutions for Indian thermal power plants? What are their technical aspects?
- ❖ What are the associated costs? What are the space and time requirements for FGD implementation?
- ❖ What are the industry best practices? What are some of the successful global benchmarks for the technology?

### FOCUS ON RAW MATERIALS

- ❖ What are the various raw material requirements for FGD systems?
- ❖ What is the projected availability for upcoming FGD systems?
- ❖ What are the key issues and concerns? What are the challenges involved in disposal of by-products?

## Organisers

The conferences on **O&M of Coal-based Power Plants** and **Flue Gas Desulphurisation System** are being organised by **India Infrastructure Publishing**, the leading provider of information on 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**.

# O&M OF COAL-BASED POWER PLANTS

## Mission

- Coal continues to be the primary source of electricity in India, with 58 per cent share in the total installed capacity and 80 per cent share in total generation. Focused operations and maintenance (O&M) practices play a key role in achieving high efficiency levels, ensuring the good health of the equipment and minimising plant outages.
- Most of the existing coal-based plants have been designed to operate at full or base load in order to achieve maximum efficiency. The increasing share of intermittent renewable energy in the grid calls for flexible operation of these plants with more frequent start-ups and shutdowns. This can lead to increased component failure and unplanned outages. Necessary modifications and measures can minimise the cost of flexible operations.
- Boilers and turbines are the key equipment, which determine the overall performance of a power plant. Apart from meeting the flexibility requirements through retrofitting, it is extremely important to undertake preventive and condition-based maintenance of boilers and turbines to improve their efficiency and reduce the number of outages.
- Optimal utilisation of coal is another important parameter that determines the efficiency of a power plant. Appropriate strategies for coal blending, coal washing and coal handling can help maintain the design standards of equipment and reduce the specific coal consumption of the plant.
- With the notification of environmental norms, there is an increased focus on ash handling, water management and emission control. With the deadline for meeting the norms coming closer, there is an urgent need to monitor and control these parameters in power plants.
- Further, thermal power plants are among the designated consumers (DCs) under the perform, achieve and trade (PAT) mechanism (Cycle I and II) for enhancing energy efficiency. While the thermal power sector underachieved its targets under PAT Cycle-I, it is now working towards achieving the targets under PAT Cycle-II, which covers a higher number of DCs with even more stringent norms.
- **The mission of this conference is to provide a platform for identifying the emerging O&M requirements of coal-based power plants with the changing power scenario in the country. The conference will focus on technologies and strategies being adopted and enable sharing of best practices.**

## 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.

## SNAPSHOTS FROM PREVIOUS YEARS



## AGENDA/STRUCTURE

### KEY TRENDS IN COAL-BASED POWER GENERATION

- ❖ What have been the key trends in coal-based power generation?
- ❖ What are the recent developments?
- ❖ What is the outlook for the segment?

### O&M BEST PRACTICES

- ❖ What are the O&M requirements of coal-based plants in the current scenario?
- ❖ What are the best practices to enhance and maintain plant availability?
- ❖ What are the new strategies being deployed for O&M by power plant owners?

### FLEXIBILISATION REQUIREMENTS

- ❖ What is the impact of flexible load operations on the equipment of coal-based plants?
- ❖ What are the requirements and challenges being faced with respect to flexibilisation?
- ❖ What flexibilisation measures are being adopted? What are the associated costs?

### FOCUS ON BOILER EFFICIENCY

- ❖ What are the key issues and concerns in boiler operations?
- ❖ What are the new and emerging O&M-related requirements?
- ❖ What are the new and promising solutions available to address these? What are the best industry practices?

### FOCUS ON STEAM TURBINES

- ❖ What are the key O&M-related challenges for steam turbines?
- ❖ What are the best industry O&M practices for turbines?
- ❖ What are the new and promising solutions to cater to the emerging requirements?

### COAL HANDLING SYSTEMS

- ❖ What are the new coal handling requirements of power plant operators?
- ❖ What are the technologies and solutions for optimising coal handling?
- ❖ What are the key issues and challenges?

### FOCUS ON 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?

### FLY ASH MANAGEMENT

- ❖ What are the key O&M requirements of ash handling systems?
- ❖ What are the issues and challenges in this regard?
- ❖ What are the best practices?

### WATER AND WASTEWATER MANAGEMENT

- ❖ What has been the trend in water consumption and challenges being faced in water availability?
- ❖ What are the new technologies available for water and wastewater management?
- ❖ What has been the industry experience in the uptake of various solutions?

### ROLE OF TECHNOLOGY/AUTOMATION

- ❖ What are the key application areas for automation in coal-based plant operations?
- ❖ What are the features and benefits associated with various technology options?
- ❖ What are some of the advanced and emerging technologies and solutions available in this area?

### ENERGY EFFICIENCY

- ❖ What has been the experience under the first cycle of the PAT scheme? What are the targets for future?
- ❖ What have been the best practices and technologies deployed for achieving energy efficiency targets?
- ❖ What is the way forward for ensuring greater compliance and enforcement?

### Previous participants

The participants in our previous conference include Accenture, Adani Mining, Aries Power Systems, Bevcon 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 Private, 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 (December 18, 2017, Shangri-La’s - Eros Hotel, New Delhi)
- I would like to register for the “O&M OF COAL-BASED POWER PLANTS” conference (December 19, 2017, Shangri-La’s - Eros Hotel, 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	Discounted fee (before November 28, 2017)				Fee without discount (after November 28, 2017)			
	INR	GST @18%	Total INR	Total USD	INR	GST @18%	Total INR	Total USD
One delegate	12,800	2,304	15,104	252	16,000	2,880	18,880	315
Two delegates	22,400	4,032	26,432	441	28,000	5,040	33,040	551
Three delegates	32,000	5,760	37,760	629	40,000	7,200	47,200	787

### BOTH CONFERENCES

Delegates	Discounted fee (before November 28, 2017)				Fee without discount (after November 28, 2017)			
	INR	GST @18%	Total INR	Total USD	INR	GST @18%	Total INR	Total USD
One delegate	20,000	3,600	23,600	393	25,000	4,500	29,500	492
Two delegates	32,000	5,760	37,760	629	40,000	7,200	47,200	787
Three delegates	44,000	7,920	51,920	865	55,000	9,900	64,900	1,082

**Terms and Conditions:**

- There is a 20 per cent “early bird” discount for those registering before November 28, 2017.
- 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.
- Conference fees cannot be substituted for any other product or service being extended by India Infrastructure Publishing Pvt. Ltd.

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