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GOVERNMENT OF INDIA
MINISTRY OF POWER

AGENDA

KNOWLEDGE DISSEMINATION WORKSHOP ON COAL GENERATION FLEXING PRACTICES TO SUPPORT VARIABLE RENEWABLE ENERGY INTEGRATION

**UNDER GREENING THE GRID (GTG) PROGRAM
RENEWABLE INTEGRATION AND SUSTAINABLE ENERGY
(RISE) INITIATIVE,**

A JOINT INITIATIVE BY USAID AND MOP

**IN PARTNERSHIP WITH
NTPC LIMITED**

August 24-25, 2018

**Venue: Power Management Institute
NTPC Limited, Sector 16-A
Noida, India**



GREENING THE GRID/INDIA

USAID's Greening the Grid (GTG) is a five-year program implemented in partnership with the Ministry of Power (MOP) under the U.S.-India partnership to Advance Clean Energy Deployment (PACE-D). This program aims to support the Government of India's (GOI) efforts to manage large-scale integration of Renewable Energy (RE) into the grid. The program combines the following three components:

- Power system planning reforms and targeted analysis for large RE parks and RE integration pilots
- Renewable Integration and Sustainable Energy (RISE) initiative to implement innovation pilots to improve the integration of RE
- Peer-to-Peer exchanges between U.S.-India system operators and regulators

Under the GTG-RISE initiative, six grid integration pilots will be implemented aimed at testing and evaluating building blocks to improve the integration of RE in India's state and national power grids. One of the pilots focuses on introducing flexibility in the operations of conventional coal based power generation plants to address the variance and intermittency of RE generation. The pilot is being implemented in partnership with NTPC at two units at Jhajjar and Ramagundam power stations.

WORKSHOP BACKGROUND & OBJECTIVES

Workshop Background:

The two-days workshop aims to discuss flexing operational practices, infrastructure improvements and damage mitigation techniques to limit impacts caused by flexing. Traditionally, coal power plants are designed to run at constant output, and electric utilities feel that ramping and cycling may reduce efficiency, increase costs, lower equipment lifetime, and is generally ill-advised or even impossible. However, in a number of countries, such ramping and cycling has long been considered normal practice. India with high coal dependence but ambitious goals for integration of variable renewable energy, "hourly ramping" and "daily cycling" of coal power plants, that is, varying their output over a wide range during the day and on a daily basis, and even shutting them down, is becoming an increasing operational necessity.

Workshop Objectives:

The objective of this two-days workshop is to advance participants' knowledge of coal flexing generation operational improvements and mitigation techniques to confront impacts. During the workshop, delegates will discuss:

- Operational modifications to existing coal plants to increase their flexibility to allow for increased load gradients (ramping rates), reduced minimum stable outputs, faster startup (from zero output).
- Infrastructure improvements that can be made to coal generators, including control software and equipment.
- Measures to minimize operational and maintenance (O&M) impacts.
- Successful international case studies on coal based flexible power operations including cost implications.
- Key findings from studies and analysis carried out under GTG-RISE Coal flexibility pilot at NTPC Jhajjar and Ramagundam stations.

ORGANIZERS

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AGENDA (DAY I - AUGUST 24, 2018)

9:00 am **Welcome Tea & Registration**

INAUGURAL SESSION

9.30 - 9:40 am **Welcome of dignitaries & Introduction of speakers and participants**

Moderated by Mr. A K Sinha, NTPC

9.40 - 9.50 am **Welcome remarks**

Mondli Zeya Hazra, USAID

9.50 - 10.00 am **Special Address**

Director, NTPC

10.00 - 10:10 am **Inaugural address**

Shri S K Kassi, Director, MoP (TBC)

10.10 - 10:20 am **Key Note Address**

CEA (TBC)

10.20 - 10.30 am **Vote of Thanks**

Shubhranshu Patnaik, Chief of Party, GTG-RISE

10:30 - 10.50 pm Group photo followed by tea

TECHNICAL SESSIONS

10.50 - 11:20 am **Coal Based Flexible Operations- NTPC's perspective**

Speaker: Mr. A.K.Sinha, NTPC

11.20 - 1.00 pm **Coal Flexing Operational Practices: Session One**

Cycling damage and damage or life management of steam turbines in cyclic operation

Doug H/Dave R, Intertek

1.00 - 2.00 pm **Lunch**

2:00 - 3.00 pm **Coal Flexing Operational Practices: Session Two**

Introduction to Cost of Cycling

Nikhil Kumar, Intertek

3:00 - 3.45 pm **Operational Strategies for Flexing in Thermal Plants**

NTPC & GE Power

3.45 - 4.00 pm **Tea**

4.00 - 5.00 pm **ASME B31.1 and High Energy Piping**

Marv C, Intertek

5:00 pm **Adjourn**

AGENDA (DAY II- AUGUST 25, 2018)

9:00 am	Welcome Tea & Registration
9:30 - 9:40 am	Welcome of dignitaries & Introduction of speakers <i>Moderated by Mr. A K Sinha, NTPC</i>
9:40 - 11 am	USAID GTG RISE Flexible Generation Pilot – Ramagundam Report Review <i>Nikhil Kumar/Doug H, Intertek</i>
11:00 – 11:30am	Cycling damage and damage or life management of BOP equipment <i>Dave R, Intertek</i>
11:30 - 11:45 am	Tea
11:45 – 12:45 pm	HEP Industry Concerns and Walkdown Issues <i>Marv C, Intertek</i>
12:45 - 2:00 pm	Group photo and Lunch
2:00 - 2:45 pm	USAID GTG RISE Flexible Generation Pilot – Jhajjar Report Review <i>Nikhil Kumar/Doug H, Intertek</i>
2:45 - 3:30 pm	Boiler Flexible Operation (Impacts & Countermeasures) <i>Doug H, Intertek</i>
3:30 - 4:00 pm	Water Chemistry Review <i>Doug H/Nikhil Kumar, Intertek</i>
4:00 - 4:30 pm	Low Load Operation for Tangentially Fired Boilers (Web Presentation) <i>Flame Stability, Challenges and Mitigation</i> <i>Tom B, Intertek</i>
4:30 – 4:45 pm	Tea
4:45 – 5:30 pm	Report Review & Q&A
5: 30pm	Adjourn