

## Study of GCV Profiling and Stackyard Coal Property Change Analysis of NTPC's Power Plant at Farakka

### 1. INTRODUCTION

**Gross Calorific Value ( GCV)** of coal is a measure of available heat energy in coal that directly affects the power plant performance in terms of power generation, stoppages, and quality of power – to name a few. As a power plant receives power from various sources, the GCV is likely to be different that creates imbalance. Moreover, grade slippage due to supply of poorer grade of coal leads to higher payment on the part of Power Company to its supplier. A GCV profiling can help a power plant to adequately address the issues-bringing enhanced performance and monetary benefit to the Power company, in this case NTPC.

**Background: The details of the project have been worked out on the basis of the following detailed meetings:**

1. Mr. Ajay Singhal ,Additional General Manager ( Fuel Management),NTPC visited the Department of Mining Engineering, Indian Institute of Technology,Kharagpur on 1<sup>st</sup> August,2015 to meet and discuss with Prof. Jayanta Bhattacharya to award a project on “Coal GCV Profiling of NTPC's power plant at Farakka ”.
2. IIT Khragpur team visited NTPC Farakka for two days( 28<sup>th</sup> and 29<sup>th</sup> August,2015) and met with the officers of NTPC Farakka and they were taken around to see the actual work process and procedure. Finally they had a comprehensive meeting and discussion.

Record notes of discussion with IIT Kharagpur and NTPC at NTPC Farakka on 29.08.2015.

MEMBERS PRESENT:

NTPC FARAKKA	A K SATPATII, AGM-CHEM A CHATTERJEE, AGM-MGR
NTPC KAHALGAON	S K DAS, AGM-MGR R K DAS, DY MGR-CHEM
NTPC ERHQ-1	S K SHARMA, AGM-OS
NTPC CC	A K SAHAY, AGM-OS-CHEM H R MALICK, AGM-FM
IIT KARAGPUR	J BHATTACHARYA, PROFESSOR, DEPT OF MINING ENGG AND HEAD, SCHOOL OF ENVIRONMENTAL SCIENCE AND ENGINEERING. A MAJUMDER, PROFESSOR, DEPT OF MINING ENGG. K DAS, RESEARCH SCHOLAR, SCHOOL OF ENVIRONMENTAL SCIENCE AND ENGINEERING.

In the meeting it was discussed that it important for a power plant, here for NTPC, to find out the GCV of "As Received" Coal and that of "As fired" in the form of a profile .

## 2. SCOPE OF THE STUDY

On the basis of the above discussion the following scopes were identified for the project:

1. IIT Team will conduct a **study on GCV profiling**. IIT team has identified the following sampling locations for GCV profile mapping:
  - I. At unloading point at station end
  - II. Before crusher
  - III. After crusher (-20 mm)
  - IV. Before bunkering
  - V. From coal feeder inlet
  - VI. After pulveriser before boiler inlet
  - VII. From mill reject

For the above , IIT Kharagpur and NTPC will identify **6 separate rakes** for which the GCV profiling will be done as per the sampling locations (I-VII).

2. Upon getting the offer of the work , IIT Kharagpur will start the work on GCV profiling as soon as possible and submit the report soon after completion. Other works will also start simultaneously.
3. IIT Kharagpur has proposed to **conduct a study of change in GCV in stack yard due to stacking of coal for one year duration**. For this IIT shall identify the location and other modalities for sampling.
4. IIT will submit the detailed procedure to be adopted for carrying out the work.
5. NTPC will provide the required logistics and operational help including manpower and infrastructure for sampling and sample preparation at different locations.
6. The work will commence tentatively within 4 weeks of award of work.
7. All sample preparation, and total moisture content determination work will be carried out in the station laboratory as per IIT suggestion and methodology. **IIT Team will carry the samples to test in their laboratory.**
8. **Analysis work for GCV profiling and proximate analysis of each source will be done at IIT Kharagpur.**
9. Upon completion IIT team will submit the Final Report.

As can be seen from the above IIT Kharagpur team will conduct 2 separate studies: 1.GCV profiling, and 2. Stackyard study.

### 3. EXPECTED OUTCOME OF THIS STUDY

The work will provide the following outcome:

1. GCV profiling of coal at Farakka NTPC station.
2. Proximate analysis of the coal at the studied plants collected during GCV profiling.
3. The change of coal property at the stack yard.