NTPC LIMITED

CORPORATE OPERATION SERVICES

ENGINEERING OFFICE COMPLEX
A-8A, SEC-24, NOIDA, U.P.201301
PH: 0120-2410333, FAX:0120-2410272

TRANSMITTAL FOR DOCUMENTS

FROM : AGM(OS-BLR)

REF. : OS/Blr/Simhadri/ST-II/PG-SG/

DATE : 29.12.11

TO :
1) AGM-EEMG - Simhadri
2) AGM (O&M) - Simhadri
3) GM – Simhadri
4) Task Force Incharge-EOC Noida
5) M/s. BHEL
6) RED (SR) – for kind inf. Pl.
7) Office Copy

SUB. : Approved PG Test Procedure for Milling System for Simhadri STPP Stage-II(2X500MW)

Please find enclosed document on the above subject for necessary action at your end as indicated in purpose code.

Sl. No.	Document No.	Rev. No.	Document Title	No. of copies	Purpose Code	Remarks
01.	COS/Blr/Simhadri/ ST-II/PG-SG/	01	PG Test Procedure for Milling System.	01	01	

Transmittal Purpose Code

1. For implementation

Choudhary

(VINOD CHOUDHARY)
OPERATION SERVICES

NTPC LIMITED
CORPORATE OPERATION SERVICES

29.12.2011

SUBJECT : APPROVAL FOR Milling System PG TEST PROCEDURE

REF. NO. : OS/BLR/Simhadri/ST- II/ PG-SG /

STATION : SIMHADRI ST-II(2X500MW)

PACKAGE : STEAM GENERATOR AND AUXILIARIES

VENDOR : M/s. BHEL

REFERNCE : PROCEDURE FOR Milling System Performance Guarantee Test
REF. - OS/BLR/ Simhadri/ST- II/ PG-SG / NO. OF PAGES-14

REVIEWED BY	**DGM (OS-BLR.)**	**SIGNATURE**
VERIFIED BY	**AGM(OS-BLR.)**	**SIGNATURE**
APPROVED BY	**ED (OS)**	**SIGNATURE** **DATE** 29/12/11 **SEAL** G. J. DESHPANDE Executive Director (OS)

NTPC LTD
SIMHADRI STPP STAGE II (2X500 MW) # 3 & 4

1003 XRP BOWL MILL

MILLING SYSTEM
PERFORMANCE GUARANTEE TEST
PROCEDURE

BHARAT HEAVY ELECTRICALS LIMITED
HYDERABAD-502 032

DOC.NO. BHEL-H/PGTP-BM/SIIMHADRI/2011

Date: 23rd MAY.2011

NTPC- SIMHADRI STAGE II (2X500MW)

MILL PERFORMANCE TEST PROCEDURE

1.0 The procedure is mainly in two parts i e. for the mill capacity test & for grinding clement wear life assessment. The procedure is generally in line with ASME PTC 4.2 code.

2.0 Mill capacity test.

2.1 Objective:

The procedure envisages capacity tests at two stages as follows:

A) The objective of the test is to establish the mill rated capacity of 65 t/hr for the guaranteed coal (design coal) condition. The above capacity will be maintained and demonstrated with originally installed grinding elements in new condition in one mill of each steam generator.

B) The objective of the test is to establish the mill capacity of 57.83 t/hr for the guarantee coal (design coal) condition for four nos. of coal pulverisers per steam generator. The above capacity will be maintained and demonstrated with originally installed grinding elements in nearly worn out condition or guaranteed wear life whichever occurs first

Guarantee coal conditions are as follows:

A)	Total Moisture %	: 14
B)	HGI	: 55
C)	Fineness	: 70% through 200 mesh
		: 99% through 50 mesh

Other Mill Parameters

D)	Mill outlet temperature °C	: not less than 78°C
E)	Mill air flow T/hr	: 102
F)	Differential Pressure	: Not Exceeding 300 mmWC

2.2 Procedure:

A. Check the quantum of hot air flow through mill by measuring the DP across the hot PA flow duct venturi & air temperature (local) and verify the DP transmitter reading & the mill inlet temperature in control room to confirm the control room air flow quantity meter matches with measured air flow through the duct.(using venturi graph)

B. Ensure Callibration of Raw coal Feeder before test.

C. Check pulverized fuel fineness and adjusts the mill to get the desired fineness (as close as possible). No adjustment that requires a shut down of the mill shall be allowed.

D) Check the Raw coal Hard groove index and total moisture from customer record. HGI range 50 – 60 would be considered for the test.

E) Load the mill to maximum possible condition with rated mill outlet temperature and Pulverized coal fineness (as mentioned above).

F) Run the mill at this condition for 2 hours (As per ASME PTC 3.5 clause) and record the following (Refer Annexure – VII): -

a) Mill outlet temperature
b) Mill inlet temperature
c) PA header pressure
d) Mill differential pressure
e) Unit load
f) Mill Air flow
g) Coal flow
h) Mill current

Readings will be recorded every second and an average of these readings for a period of two hours will be taken.

G) Coal Sampling Test

i) Pulverized coal sample shall be collected by iso-kinetic sampling method once during the test.
j) Raw coal sample once during the test for TM & HGI.
k) Collect mill rejects for one hour, weigh & record the same.

H) Analyze for fineness of pulverized coal and total moisture of raw coal at customer site / Lab as per ISO Standard. Surface Moisture to be tested on collection of the raw coal.

I) For HGI analysis collected raw coal will be made into 3 parts after coning and quartering. First part shall be for BHEL, second part for the customer and third to be sealed and kept with customer as neutral sample.

J) Correct the mill output for change in total moisture and Hard groove index of coal as per the capacity correction curves in Annexure – I & II.

2.3 Instruments required:

A) Sampling device for collecting pulverized coal.
B) Sieves of size 200, 100, & 50 mesh.
C) Manometer, thermocouple and temperature indicator.

3.0 Mill wear life assessment

3.1 Objective: -

The objective of this test is to realize the maximum wear life of grinding element as given in the technical specification.

3.2 Procedure: - Monitor Mill input and output as given below once in a day / week. (Refer Annexure – III & IV)

a. Raw coal sample at mill inlet will be collected for finding the raw coal size i.e.: % raw coal passing through 25x 25-mm mesh.
b. Raw coal sample for finding the % rock i.e.: constituents > 1.8 SP gravity.
c. Raw coal sample will be collected for finding HG1, Total moisture, Ultimate & Proximate analysis.
d. Pulverized coal sample will be collected for finding the fineness.
e. The occurrence of foreign material entry, sand accumulation, etc will be noted on a daily basis.
f. Mill rejects shall be analysed for the quantity of foreign material.
g. General operating data of the mills shall be recorded. (Annexure- IV)

3.3 Wear will be measured on the grinding rolls at three positions i.e. 120° apart at various locations with equal spacing as per the Roll wear measurement procedure (Ref. Annexure-VI) and recorded on log sheet (Ref. Annexure-VII). Three points having maximum wear will be considered for wear measurement.

3.4 Instrument and facilities required

a) 25 x 25 mm mesh
b) Roll wear-measuring gauge.
c) PF sampling device.
d) Liquid for separating particle of > 1.8 sp.gravity.

NTPC to provide lab facilities for fineness, HGI and proximate and other analysis.

CAPACITY CORRECTION CURVES

1. PURPOSE:

   The capacity correction curves are drawn for the predicted coal of HGI and moisture to evaluate the performance of the mill

2. CORRECTION METHODS:

   a) Mill output has been corrected to predicated coal HGI as per the correction curve-1. (Annexure-I)

      Correction factor is taken as ratio of % Mill capacity for predicated coal HGI and % Mill capacity for guaranteed coal HGI.

   b) Mill output has been corrected to predicated coal moisture as per the correction Curve-II. (Annexure-II)

      Correction factor is taken as ratio of % Mill capacity for predicated coal moisture and % mill capacity for guaranteed coal moisture.

   c) Total correction factor is the product of all the above two correction factors.

   d) Mill output (final) for predicted coal (corrected with guaranteed coal) is the product of guaranteed coal output and total correction factor.

   e) On similar lines mill output (corrected to guaranteed coal) shall be calculated / corrected with the results of HGI & TM of coal collected during the PG test.

3. Coal conditions considered for the purpose of drawing correction curves.

a) Guaranteed and Test coal conditions are:

	Guaranteed coal	Test Coal
Capacity (Max) t/hr	65	A
Moisture	14	16
HGI	55	60

4. Correction calculations:

PARAMETERS	UNITS	VALUE
Coal output (Test) A	T/Hr	70
Total Moisture (guaranteed)	%	14
Total Moisture (Test)	%	16
Correction factor (C1)	-	98.27/100

Refer Annexure – II

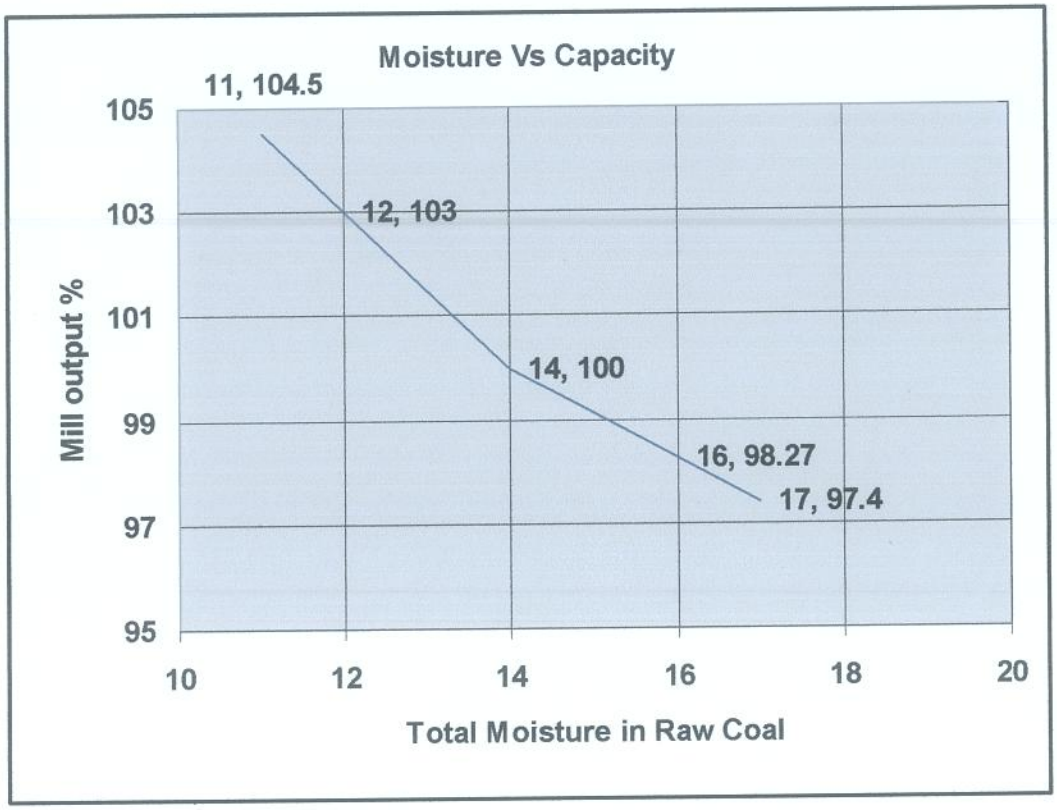
PARAMETERS	UNITS	VALUE
Grindability (Guaranteed)	HGI	55
Grindability (Test)	HGI	60
Correction factor (C2)	-	106/100

Refer Annexure – I.

Total Correction factor (C = C1 X C2) : 1.042
Corrected Coal output (A/C) T/Hr : 67.17
(Corrected to design)

ANNEXURE – II

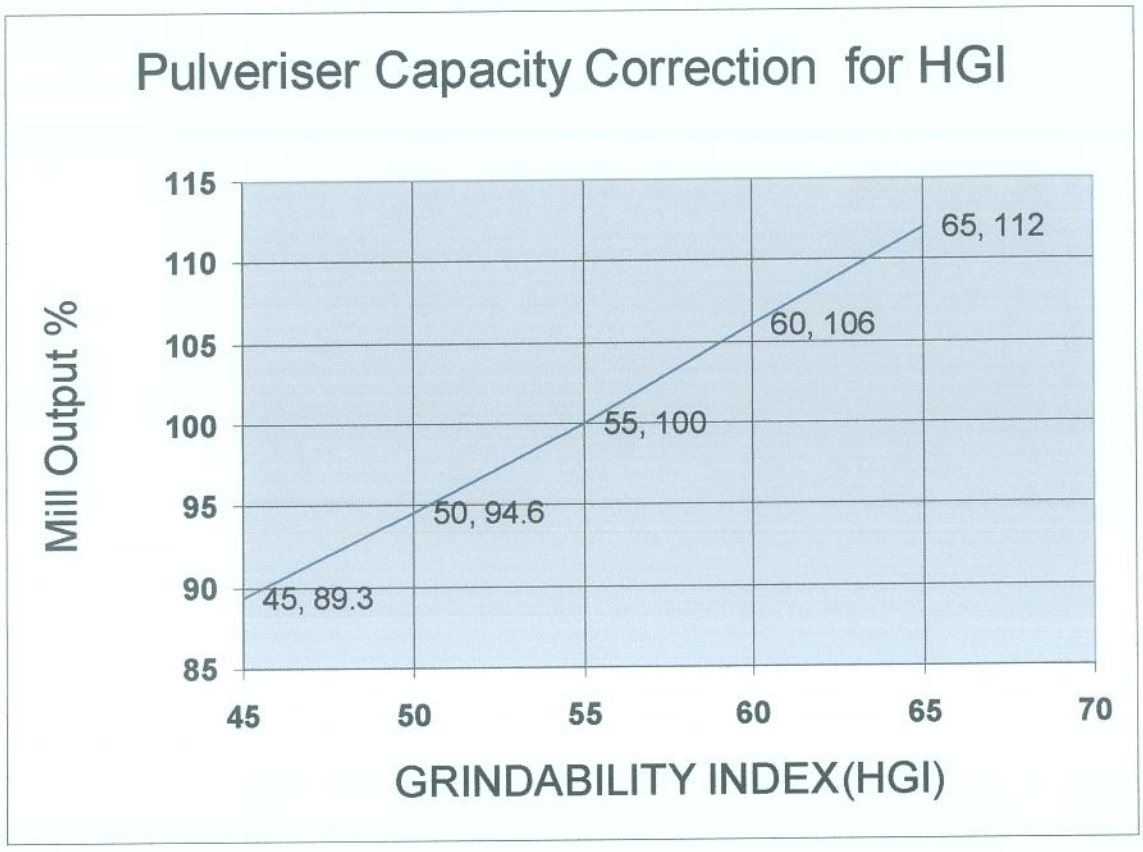
MILL OUTPUT
VS
TOTAL MOISTURE IN RAW COAL



DOC.NO. BHEL-H/PGTP-BM/SIIMHADRI/2011

Date: 23rd MAY.2011

MILL OUTPUT
VS
HGI OF RAW COAL



DOC.NO. BHEL-H/PGTP-BM/SIIMHADRI/2011

Date: 23rd MAY.2011

MILLING PACKAGE PG TEST 1003 XRP BOWL MILL

NTPC- SIMHADRI STAGE II (2X500MW)

MILL RUNNING HRS AND COAL CHARACTERISTICS (FOR GRINDING ELEMENT WEAR ASSESSMENT) – DAILY LOG

PROJECT - UNIT: DATE: TIME:

MILL	A	B	C	D	E	F	G	H	J
ROLL RUNNING HOURS									
SEGMENT RUNNING HOURS									
TOTAL COAL GROUND									
INCIDENCE OF FOREGN MATL ENTRY									
REJECT CONDITION									
ANY OTHER ABNORMALITY									

READING TAKEN BY BHEL NTPC

NAME

SIGN

ANNEXURE-IV

MILLING PACKAGE PG TEST 1003 XRP BOWL MILL

NTPC- SIMHADRI STAGE II (2X500MW)

MILL PARAMETERS AND COAL CHARACTERISTICS (FOR MILL WEAR MEASUREMENT) - WEEKLY LOG

PROJECT: UNIT LOAD:

MILL DESCRIPTION	A	B	C	D	E	F	G	H	J
1) RAW COAL SIZE PASSING THRU 25 X 25 %									
2) ROCK CONTENT (CONSTITUENT IN COAL>1.8 sp.Gr.) %									
3) COAL HGI									
4) COAL MOISTURE %									
5) FINENESS + 50 mesh + 100 mesh - 200 mesh									
6) COAL GCV K cal / kg									
7) CLASSIFIER POSITION									
8) SPRING COMPRESSION									
9) TS END CAP POSITION									
10) REJECT RATE Kg/hr									

DOC.NO. BHEL-H/PGTP-BM/SIIMHADRI/2011 Date: 23rd MAY.2011

MILLING PACKAGE PG TEST 1003 XRP BOWL MILL

NTPC- SIMHADRI STAGE II (2X500MW)

MILL PARAMETERS AND COAL CHARACTERISTICS (FOR MILL WEAR MEASUREMENT) - WEEKLY LOG

PROJECT: UNIT LOAD:

MILL DESCRIPTION	A	B	C	D	E	F	G	H	J
11) UNIT LOAD (MW)									
12) AIR FLOW T/hr									
13) COAL FLOW T/Hr									
14) MILL DP (mm WC)									
15) MILL INLET TEMPERATURE °C									
16) MILL OUTLET TEMPERATURE °C									
17) MILL CURRENT AMPS									
18) PA HEADER PRESSURE (mm WC)									

ANNEXURE-V

MILLING PACKAGE PG TEST 1003 XRP BOWL MILL

NTPC- SIMHADRI STAGE II (2X500MW)

ROLL WEAR ASSESSMENT - LOG SHEET

PROJECT: UNIT LOAD:

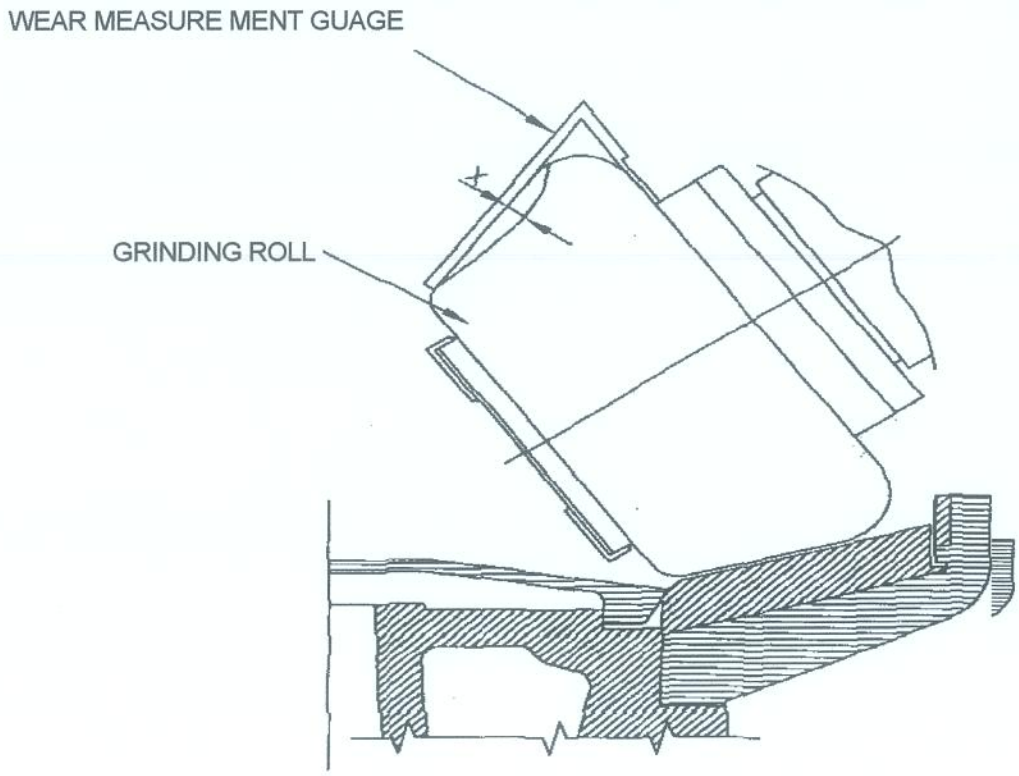
MILL NO. DATE:

RUNNING HOURS AT READING WERE TAKEN:

MARK NO	ROLL A			ROLL B			ROLL C		
	1	2	3	1	2	3	1	2	3
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

ROLL IDENTIFICATION:

WEAR MEASUREMENT GAUGE



ATTACH WEAR MEASUREMENT GAUGE JOURNAL ASSEMBLY. IT IS IMPORTANT TO HOLD THE GUAGE SECURELY AGAINST LOWER JOURNAL HOUSING TO ENSURE ACCURATE READING

MEASURE THE DIMENSION "X" AT VARIOUS LOCATION (120 DEG APART AT EACH LOCATION) WITH EQUAL SPACING. RECORD ON DATA SHEET (ENCLOSED IN ANNEXURE – VII) BEFORE AND AFTER THE ROLL IN SERVICE. READINGS MAY BE TAKEN AS AND WHEN THE MILL IS SHUT DOWN, AT 1000 HOURS TIME INTERVAL.

DOC.NO. BHEL-H/PGTP-BM/SIIMHADRI/2011 Date: 23rd MAY.2011

ANNEXURE-VII

MILLING PACKAGE PG TEST 1003 XRP BOWL MILL

NTPC- SIMHADRI STAGE II (2X500MW)

MILL CAPACITY TEST - LOG SHEET

PROJECT: UNIT LOAD:

MILL NO. DATE:

Sl No	TIME	LOAD	COAL FLOW	MILL INLET TEMP	MILL OUTLET TEMP	PA HEADER PRESSURE	AIR FLOW	MILL DP	MILL CURRENT
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

MILL REJECT QUANTITY Kg/Hr

READINGS TAKEN BY BHEL NTPC

NAME:

SIGNATURE:

DOC.NO. BHEL-H/PGTP-BM/SIIMHADRI/2011 Date: 23rd MAY.2011