



BHARAT HEAVY ELECTRICALS LIMITED
Heavy Power Equipment Plant
Ramachandrapuram, Hyderabad – 502 032

ANNEXURE-A
(to BHEL Specification BA35034)

1.0.0 Intent of the Specification

The intent of the specification is to procure "wear parts" (Grinding Rolls and Bull Ring Segments) for XRP 1003 Bowl Mill type coal pulverisers of BHEL Make operating at NTPC Dadri Stage-II.

It is not the intent to specify completely herein, all aspects of material selection and manufacturing process, nevertheless, the wear parts shall conform in all aspects to high standards of material quality, manufacturing process and workmanship and shall be capable of performing in continuous commercial operation, in a manner acceptable to the owner, who will interpret the meaning of specification, drawings and shall have right to reject or accept any work or material which in his assessment is not complete to meet the requirement of this specification.

Bidder is requested to carefully examine and understand the specification and seek clarifications, if required, to ensure that they have understood the specification. The Bidder's offer should not carry any sections like clarifications, interpretations and/or assumptions.

2.0.0 Not Applicable

3.0.0 Applicable Drawings:

The drawings listed below and forming part of the specification are for Bidder's information. All these drawings are indicative of Owner's requirement to enable the Bidder to make a suitable offer. It shall, however, be responsibility of the Bidder to ensure fitment of the supplied material.

Drawing No. : NCT/SPD/ST2/BM-1697, Sheet 1 of 2 for Grinding Roll
Drawing No. : NCT/SPD/ST2/BM-1697, Sheet 1 of 2 for Bull Ring Segment

Any variation/alteration from the listed drawings shall be clearly brought out in the technical deviation schedule with implications, if any. Such variations may be acceptable, after assessment of its implication and shall be subject to Owner's approval.

4.0.0 Scope of the Proposal:

The scope of the proposal shall include manufacturing, testing, packaging, transportation, delivery on F.O.R (BHEL Hyderabad) basis of wear parts of XRP 1003 type coal Pulverisers comprising of the following (As per Drawings mentioned at 3.0.0):

- i. Grinding Rolls
- ii. Bull Ring Segment

Detail manufacturing drawings of all wear components to be submitted for approval before taking up manufacturing.

The scope of proposal shall also include supervision of installation (supervision of installation of 1st set of wear parts) of above wear parts.

4.1.0 The scope of supply of Bidder shall include supply of mill wear parts, that is set of grinding rolls, set of bull ring segments for 14 numbers of coal pulverisers such that these wear parts are compatible with each other.

Note1: Together three nos. grinding rolls required for one pulveriser shall form "One set of Grinding Rolls" and bull ring segment quantity required for one pulveriser shall form "One set of Bull Ring Segment".

- 4.2.0 The quantity of wear parts shall be such that 20,000 Hrs. (Twenty Thousand hrs) of operation of each mill can be achieved with pulveriser capacity not less than 75% of its maximum capacity at rated fineness (refer Note 2) for the specified range of coals. The Bidder shall guarantee the life of each type of wear part (i.e. grinding roll, bull ring segments) and this guaranteed life of respective wear parts shall be the basis for calculating the quantity of wear parts. The guarantee for wear parts life shall be in accordance with the guarantee requirement specified in subsequent sections.

Note 2:- The rated fineness not be less than 70% thru 200 mesh.

- 4.3.0 In the bid proposal the Bidder is required to offer the wear parts in such quantities that the cumulative wear life (based on guarantee provided by the Bidder for wear life of wear parts) for each type of wear part (i.e. grinding rolls, bull ring segments etc.) is not less than the number of hours resulting from multiplications of "number of coal pulverisers for which wear part are being procured" X "20000 operating Hrs". The required Quantity/sets of wear parts shall be arrived at by rounding off the fractional part of the set to next higher whole number.
- 4.4.0 The wear life guarantee for each set and type of wear parts shall be from within the range of 2000 Hrs – 10000 Hrs and the quantity of wear parts shall be calculated based on guaranteed wear life from within above range only. Life of grinding rolls set and bullring set shall be same. An example for arriving at number of sets of wears parts for the purpose of Bidder's quotation is given below at Table - 1:

S. No.	Description	Bidder A	Bidder B
1.	Number of coal pulveriser	10	10
2.	Guaranteed wear life of each set of grinding rolls	7000	10000
3.	Guaranteed wear life of each set of bull ring segment	7000	10000
4.	Number of sets of grinding rolls required to be quoted per Mill	$20000/7000=2.85$	$20000/10000=2.00$
5.	Number of sets of grinding rolls required to be quoted per Mill	3.00 (Rounded off to next whole no.)	2.00 (Rounded off to next whole no.)
6.	Number of sets of grinding rolls required to be quoted for 14 Mills	$14 \times 3.0=42$ sets	$14 \times 2.0=28$ sets
7.	Number of sets of BRS required to be quoted per Mill	$20000/7000=2.85$	$20000/10000=2.00$
8.	Number of sets of BRS required to be quoted per Mill	3.00 (Rounded off to next whole no.)	2.00 (Rounded off to next whole no.)
9.	Number of sets of BRS required to be quoted for 14 Mills	$14 \times 3.0=42$ sets	$14 \times 2.0=28$ sets

Note that the wear life i.e. 20,000 hours/guaranteed wear life should be first rounded off to the next whole number and then multiplied by 14, so that it satisfies the requirement of 14 Mills.

5.0.0 Evaluation Criteria

The bids guaranteeing wear life less than 2000 Hrs. will not be considered for evaluation and shall be rejected. Further, no evaluation credit will be given for guaranteed wear life in excess of 10000 Hrs.

The evaluation of the bids shall be based on the total price of (a) sets of bull ring segments and (b) sets of grinding rolls quoted by the Bidder in accordance with the clause 4.0.0 "Scope of the Proposal".

6.0.0 Material of Construction

The material of construction of wear parts shall be selected such that of wear part guarantee for wear life.

S. No.	Name of Wear Part	Material
1.	Bull Ring Segments	Ni Hard, High Chrome, Ceramic Insert, Sinter Cast etc.
2.	Grinding Rolls	Ni Hard, High Chrome, Ceramic Insert, Sinter Cast etc.

Party to submit detail chemical composition and hardness of wear surface of his choice of material offered for making wear components.

The materials selected by the bidder for the mill wear parts and additional mill components (if required) must have been used satisfactorily in at least ten (10) numbers of coal pulverisers (10x3 = 30 Grinding Rolls + 10 sets of Bull Rings) of XRP 1003 type & above rated capacity.

7.0.0 Guarantees

The quantity of wear parts shall be such that 20000 hrs of operation of each mill can be achieved. The Bidder shall guarantee the wear life and the fitment of the wear parts in the existing mills and furnish these guarantees in Schedule - I.

7.1.0 Guaranteed Wear Life: The "wear parts", i.e. each set of grinding rolls and each set of bull ring segments shall be guaranteed for wear life in number of hours of mill operation (as mentioned by the manufacturer in offer). The guaranteed life of wear components shall be considered upto the wear as follows:

A. Hours of mill operation for wear of Grinding Roll element up to 65 mm at any portion in the set

B. Hours of mill operation for wear of Bull ring up to 50 mm at any portion in the set

If either ('A & B') or ('A or B') is not achieved both Grinding roll set and Bull ring set of same pulveriser will be considered for penalty.

NOTE: No other factor what-so-ever will be considered for demonstration of wear life.

7.1.1 The guarantee on wear life shall be provided for each type of wear part separately (i.e. Grinding Rolls, Bull Ring Segments). The guaranteed wear life for each set of grinding rolls and each set of bull ring segments shall be from within the range of 2000 Hours to 10000 Hours. Bidders offering wear life guarantee less than 2000 Operating Hours shall not be considered for evaluation. Further, Bidder's offering wear life guarantee higher than 10000 Operating Hours shall not be given any evaluation credit beyond 10000 Hrs.

7.2.0 Wear Part Guarantee: - The Bidder shall guarantee the wear life of wear parts in number of mill operating hours (Refer Note 3). The guarantee on wear life shall be demonstrated on C, D, E, F, G, H & J only.

Mill A & B (mill wear parts of bottom mill) will not be considered for demonstration of wear life

Note3: Operating hours of mill for the purpose of wear part waranntee are defined as:

A. Hours of mill operation for wear of Grinding Roll element up to 65 mm at any portion in the set

B. Hours of mill operation for wear of Bull ring up to 50 mm at any portion in the set

If either ('A & B') or ('A or B') is not achieved both Grinding roll set and Bull ring set of same pulveriser will be considered for penalty.

NOTE: No other factor what-so-ever will be considered for demonstration of wear life.

7.3.0 Liquidated Damage for Shortfall in Guaranteed Wear Life:

7.3.1 Liquidated damages shall be levied for shortfall in wear life of wear parts for each type of wear part separately.

7.3.2 If it is found that any of the wear parts viz, Grinding Rolls and/or bull ring segments have achieved life of 50% or less than the guaranteed wear life, the Contractor (bidder) shall replace the wear

parts free of cost. For wear life between 50% and 100%, the penalty of one and half times the pro-rata landed cost of short fall in duration will be charged.

Example:

Landed cost of 1 Set of WC (wear component) = Rs 10,00,000 (Rupees Ten Lakh)

Guaranteed life of each set of WC = 10,000 running hours

Actual life obtained = 8,000 hours

Short fall in life = 2,000 running hours.

Penalty for one set for short fall = $\text{Rs } 1.5 \times 2000 \times 1000000/10000$
= Rs 3,00,000 (Rupees three lakh)

7.4.0 Fitment Guarantee

7.4.1 Fitment of the supplied material in the identified Pulverisers is the responsibility of Bidder and same shall be guaranteed by the Bidder.

Sample clause: Bidder has to supply two sets of wear components as sample for fitment at site. After getting clearance of successful fitment & trial, clearance will be given for bulk supply.

1 set of wear component = 01 set (=03 nos. Grinding roll + 01 set bull ring segment (no. of segment to be as per approved drawing that will cover entire bowl with at least one tightening wedge.)

8.0.0 Quality Assurance & Inspection (*Customer RQP is enclosed for reference*)

8.1.0 Bidder shall provide the necessary information on Quality Assurance Program containing the overall Quality management and Procedures, which the Bidder proposes to follow during various stages of manufacturing of the specified wear parts. The Bidder shall also submit a detailed manufacturing quality plan in the format **(to be informed separately)** detailing out the tests/checks carried out by the manufacturer, during various stages of manufacturing, for BHEL's customer approval. The quality Plan shall be accompanied with all the plant standards, reference documents, acceptance norms, procedures and specifications. The indicative tests/checks, which shall necessarily form part of the Quality plan, are as follow:

- i. Chemical Composition and heat treatment.
- ii. Mechanical properties and measurement of hardness.
- iii. Wear – resistant parts shall be UT/RT tested to check soundness after suitable heat treatment. In case of bi-metallic castings, UT shall be carried out for ensuring the proper bonding.
- iv. Metallurgical test: Micro-structure examination will be carried out on samples selected at random.
- v. Surface defects of the wear resistant parts shall be examined by DPT.
- vi. To ensure proper fitment at site each grinding roll shall be subjected to blue matching check for proper bore surface contact. In case of bull ring segment trial assembly shall be carried out for each set on the test bowl.
- vii. Weldments on any other mill component shall be checked with suitable NDT.

8.2.0 The approved Quality Plan shall indicate BHEL's customer witness points (customer hold points) for which the Bidder shall give advance notice of 15 days for undertaking inspection.

Note: The technical specification includes following forms which need to be duly filled by the Bidder and submitted along with the bid proposal. Reference Quality Plan is enclosed with this NIT.

9.0.0 Any requirement, as specified by BHEL's customer shall be confirmed by the bidder.

Bill of Materials (extracted from NTPC tender) for
“Procurement of Wear Components (Grinding Rolls & Bull Ring Segments) for
XRP - 1003 Bowl Mills for Stage – II of NTPC, Dadri”.

S No.	Mat. Code	Short Material Description	Unit of Measurement	Total Quantity
10	M4761050766	GRINDING ROLLXRP1003BOWLMILL IN7	NO.	78
20	M4761056629	BULL RING ASSY.FOR XRP 1003 MILL	SET	26
30	M4761050766	GRINDING ROLLXRP1003BOWLMILL IN7	NO.	48
40	M4761056629	BULL RING ASSY.FOR XRP 1003 MILL	SET	16

Delivery Period: - 24 Months.

Schedule –I: Guarantee Declaration,
Schedule –II: Technical Data Sheets,
Schedule - III: Information Regarding Quality Assurance Plan,
Schedule – IV: Schedule of Rates and prices,
Schedule – V: Delivery Schedule,
Schedule-VI: Qualifying Requirements.

NTPC DADRI STAGE-II: COAL & ASH CHARACTERISTICS

PROXIMATE ANALYSIS OF COAL	UNIT OF MEASUREMENT	RANGE (TYPICAL)	
		FROM	TO
MOISTURE	%	12	15
ASH	%	30	35
HGI	Index	50	60
YGP INDEX	Mg Steel /Kg of Coal	30	40
ASH ANALYSIS			
SILICA	%	60	65
ALUMINA_____	%	30	35

Schedule- I

TECHNICAL SPECIFICATION FOR PROCUREMENT OF WEAR PARTS FOR XRP TYPE COAL PULVERISERS

Tender Document No.:

(GUARANTEE DECLARATION)

Bidder's Name & Address

BHEL-Hyderabad

Dear Sir,

We declare that the wear life of wear parts, their fitment and material specification for wear parts offered in this bid are guaranteed by us. We further declare that in the event of any deficiencies in meeting the guarantees indicated below as established in accordance the bidding documents, you may at your discretion accept the wear parts after assessing the liquidated damages as specified in clause 8.4.0 of bidding documents or reject the wear parts and recover the payment already made.

8.0.1.1 No.	Guaranteed Parameter	Guaranteed Figures
1.0	Wear Life of Wear parts	
1.1	Wear life of each set of grinding Rolls in Operating Hours as per Clause 8.0.0	
1.2	Wear life of each set of bull ring Segments in Operating Hours as per clause 8.0.0	
2.0	Guarantee for fitment	as per bidding document clause 8.5.0
Date:	(Signature)	
Place:	(Printed Name)	
	(Designation)	
	(Common Seal)	

Note: Any Variation to the stipulated conditions under which Guarantees are to be met will not be permitted and Bids with such variation are liable to be rejected.

Schedule- II

**TECHNICAL SPECIFICATION FOR PROCUREMENT OF WEAR
PARTS FOR XRP TYPE COAL PULVERISERS**

Tender Document No.

(Technical Data Sheets)

S. No	Description	Grinding Rolls	Bull Ring Segments
1	Name of manufacturer		
2	Location of Manufacturing Unit		
3	Model of Coal Pulveriser		
4	Number of Pulverisers		
5	Number of sets		
6	Number of items in each set (Bidder to list all the additional mill components as per Note 1.		
7	Wear life of each set		
8	Weight of each item (Bidder to Provide item wise list)		
9	Weight of each set		
10	Compliance to specified dimensions	Yes	Yes
11	Name of material		
12	Surface hardness		
13	Physical properties of material		
14	Chemical composition of material		

Date:
Place:

(Signature)
(Printed Name)
(Designation)
(Common Seal)

Schedule- III

TECHNICAL SPECIFICATION FOR PROCUREMENT OF WEAR PARTS
FOR XRP TYPE COAL PULVERISERS

Tender Document No.

(Information regarding Quality Assurance program)

Bidder's Name & Address

BHEL-Hyderabad

Dear Sirs,

We hereby provide the necessary information on Quality Assurance program Containing the overall Quality management and Procedures, which we propose to follow during various stages of manufacturing the specified wear parts.

Date:

Place:

(Signature)

(Printed Name)

(Designation)

(Common Seal)

Note: Continuation sheets of like size and format may be used as per Bidder's requirement and shall be annexed to this Attachment.

SCHEDULE - IV

TECHNICAL SPECIFICATION FOR PROCUREMENT OF WEAR PARTS FOR XRP TYPE COAL PULVERISERS

Tender Document No.

(Schedule of Rates and prices)

Bidder's Name & Address

BHEL Hyderabad

Item	Description	Quantity (No. of Sets)	Unit Price	Total Price
1	2	3	4	5

8.0.1.1.1 Grinding Rolls

8.0.1.1.2 Bull Ring Segments

Note: Number of sets shall be quoted as per clause 4.0.0

Date:
Place:

(Signature)
(Printed Name)
(Designation)
(Common Seal)