 <b>EPD - BANGALORE</b>	<b>Indent Specifications For 2500 kW DC Motor</b>	<b>SPECIFICATION NO. EL- 19-2009 / 001</b>
---	---	--

**TECHNICAL SPECIFICATIONS**

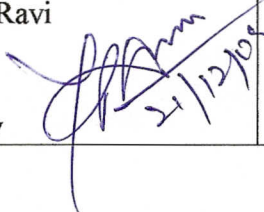
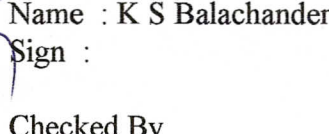
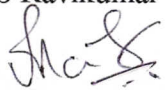
**FOR**

**2500 kW DC Motor**


**PROJECT: BHEL HYDERABAD 150 MW GENERATOR TEST BED Project**

**CONTENTS**

Cover sheet	(Approved)	Sht 1 of 5
Section – I	Site Data	Sht 2 of 5
Section – II	Scope of supply	Sht 2 of 5
Section – III	Detailed Technical specification	Sht 3 of 5
Section – IV	Inspection & Testing	Sht 4 of 5
SECTION-VI	PRICE FORMAT	Sht 5 of 5

Name : Y Ravi Sign :  Prepared By	Name : K S Balachander Sign :  Checked By	Name : S Ravikumar Sign :  Approved By
--	--	---

ISSUED BY : EPD	REV NO. 00    DATE OF ISSUE : 24.09.2008	SHEET 1 OF 5
-----------------	--	--------------

 <b>EPD - BANGALORE</b>	<b>Indent Specifications For 2500 kW DC Motor</b>	<b>SPECIFICATION NO. EL- 19-2009 / 001</b>
---	---	--

# **TECHNICAL SPECIFICATIONS**

**FOR**


**2500 kW DC Motor**

**PROJECT: BHEL HYDERABAD 150 MW GENERATOR TEST BED Project**

## **CONTENTS**

Cover sheet	(Approved)	Sht 1 of 5
Section – I	Site Data	Sht 2 of 5
Section – II	Scope of supply	Sht 2 of 5
Section – III	Detailed Technical specification	Sht 3 of 5
Section – IV	Inspection & Testing	Sht 4 of 5
SECTION-VI	PRICE FORMAT	Sht 5 of 5

ISSUED BY : EPD	REV NO. 00    DATE OF ISSUE : 24.09.2008	SHEET 1 OF 5
-----------------	--	--------------

 EPD - BANGALORE	<b>Indent Specifications For 2500 kW DC Motor</b>	<b>SPECIFICATION NO. EL- 19-2009 / 001</b>
--	---	--

## SECTION I - SITE DATA

### 1.0 SITE CONDITIONS:

- 1 Project site : BHEL- HYDERABAD, ANDHRA PRADESH
- 2 Altitude : Less than 600 meters
- 3 Air Temperature :-
  - 3.1 Air Amb. Temperature Max for Design : 40<sup>0</sup> C
  - 3.2 Air Amb. Temperature Min. : 9<sup>0</sup>C
- 4 Relative Humidity :-
  - 4.1 Relative humidity (max) : 95 %, Non Condensing
  - 4.2 Relative humidity (min) : 36 %
  - 4.3 Relative humidity for design : 100 %
- 5.0 Atmosphere : Factory Environment

Note: Maximum temperature & maximum relative humidity do not occur simultaneously.


The Equipment shall confirm to the IEC Rules 1956 and statutory requirements in Orissa State as regards safety, earthing and other essential provision specified therein for installation and operation of electrical plant and equipment.

## SECTION II - SCOPE OF SUPPLY

1. 2500 kW, 750V, 750/1000 rpm DC Motor
2. Common Base frame for Motor and Gear box (Gear box details will be provided by BHEL).
3. Ventilation Blower
4. Set of Spare bearings
5. Spare RTDs

ISSUED BY : EPD	REV NO. 00    DATE OF ISSUE : 24.09.2008	SHEET 2 OF 5
-----------------	--	--------------



 <b>EPD - BANGALORE</b>	<b>Indent Specifications For 2500 kW DC Motor</b>	<b>SPECIFICATION NO. EL- 19-2009 / 001</b>
---	---	--


### **SECTION III - TECHNICAL SPECIFICATION**

1. The DC motor is required for Driving of Generator in test pit. (Torque and power characteristics of Generator with Jacking oil are as given in annexure)  
(Drive Motor and Gear Box starting torque shall be taken in to consideration along with Generator)
2. The Drive motor needs to run continuously at different speeds from zero to base speed and top speed at proportionate power.
3. The drive motor shall be coupled to a gear box with speed ratio of 1000/4000 rpm(not a part of supply).
4. The drive motor shall be operated through Ward-leonard system output or through Thyristor convertor system.
5. Power Rating : 2500 kW
6. Voltage rating : 750 V DC
7. Field current : 220V DC, 20 A
8. Speed : 750 rpm/1000 rpm
9. Speed control : Armature voltage for base speed and for top speed with Field control.
10. Insulation : Class H
11. Temperature rise : As per class F
12. Ventilation : Forced Air (Top mounted blower)
13. Mounting : Horizontal foot mounting.
14. Duty : S1 (Continuous)
15. RTDs : For monitoring of winding, bearings and air temperature as per design
16. Speed measurement : Provision shall be given for assembling pulse Tachometer (For feed back to Thyristor convertor system) at non driven end.
17. Enclosure : IP44
18. Direction of rotation : Bi-directional by change of polarity of field or Armature voltage.
19. Offer shall be inclusive of suitable Ventilation blower and blower motor for cooling . The ventilation blower shall be mounted on the Motor along with the enclosure.
20. Auxiliary terminal : for heaters, RTDs
21. Bearings : Self oil cooled sleeve bearings.
22. Lubricating oil : Servo prime 46

**Spares** : The following spares that may be required for 2 years trouble free maintenance shall be offered along with main equipment

- a) Set of spare bearings.
- b) Spare brushes
- c) Spare RTDs

ISSUED BY : EPD	REV NO. 00	DATE OF ISSUE : 24.09.2008	SHEET 3 OF 5
-----------------	------------	----------------------------	--------------

 <b>EPD - BANGALORE</b>	<b>Indent Specifications For 2500 kW DC Motor</b>	<b>SPECIFICATION NO. EL- 19-2009 / 001</b>
---	---	--

d) Accessories

**Inspection and tests witness:** The equipment supplied shall be completely tested at manufacturers works. The inspection and performance testing shall be offered for witnessing at the manufacturers works.

**Packing and Delivery:** The consignments shall be suitably packed to protect against all possible damages during transportation and storage. It is responsibility of the vendor to deliver the complete equipment to BHEL.

**Guarantee :** The equipment supplied shall be guaranteed for 18 months from the date of handing over after commissioning. The vendor should Guarantee to provide spares for 10 years from the date of supply.

#### **SECTION IV - INSPECTION & TESTING**

The equipment supplied shall be completely tested at manufacturers works. The inspection and performance testing shall be offered for witnessing at the manufacturers works. Supplier to submit manufacturing / testing QAP for approval. Items offered shall be duly type tested at national laboratories as per latest relevant Indian/International standards. If any type test is not carried out, supplier shall carry out the same at his own cost. All items shall be offered for customer/BHEL inspection. All routine tests/ acceptance tests as per relevant Indian/International standards have to be conducted during inspection. The following tests shall be performed by the supplier on the panel.

Sl No.	Name of Test	Inspection type Type Routine	Test Method	Remarks
1	Visual Inspection	B, C	Check for overall dimensions, general arrangements, Painting, rating, make etc.	
2	Degree of protection	A	Check for degree of protection	

A - Manufacturer's test certificates would be furnished


B - Test to be conducted in presence of BHEL representative

C - Test to be conducted in the presence of customer

5.1 Type test and internal test certificates shall be furnished before inspection.

ISSUED BY : EPD	REV NO. 00	DATE OF ISSUE : 24.09.2008	SHEET 4 OF 5
-----------------	------------	----------------------------	--------------



 <b>EPD - BANGALORE</b>	<b>Indent Specifications For 2500 kW DC Motor</b>	<b>SPECIFICATION NO. EL- 19-2009 / 001</b>
---	---	--

5.2 Supplier shall submit the test & Inspection procedure along with QAP immediately along with the offer.

#### SECTION VI – PRICE FORMAT

##### a) Main

Sl No	Description	Qty.	Unit Price	Total Price	Remarks
1	2500 kW,750V,750/1000 rpm DC Motor	1 No.			
2.	Common base frame for DC Motor and Gear box	1 No			Deatails of Gear box will be given to vendors

##### b) 2 Years maintenance spares

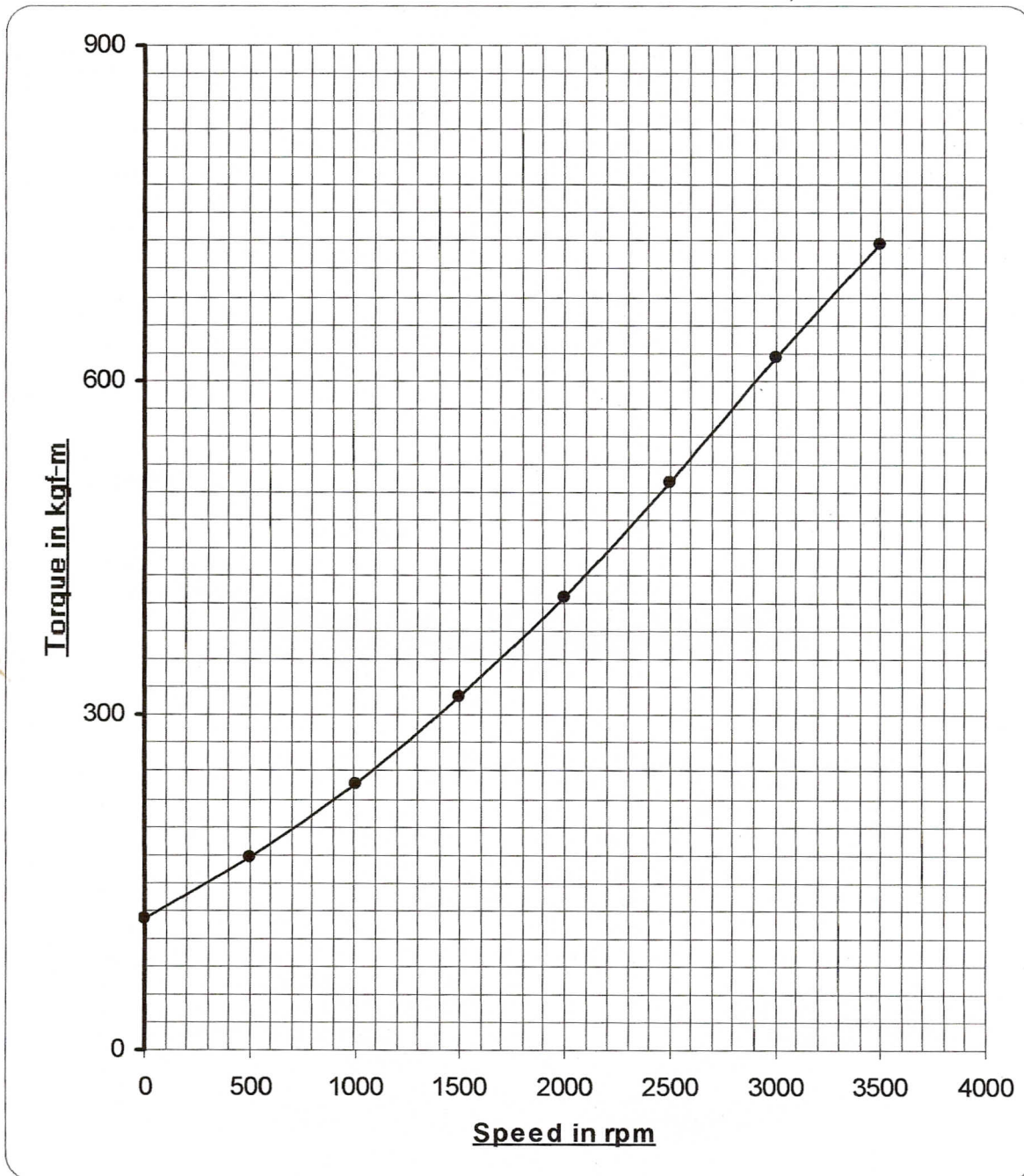
Sl No	Description	Qty.	Unit Price	Total Price	Remarks
1	Set of spare bearings	1 No.			
2	Set of Spare brushes	1 No			
3	Set of Spare RTDs	1 No			

##### c) Commissioning spares

Sl No	Description	Qty.	Unit Price	Total Price	Remarks
1					
2					
3					

ISSUED BY : EPD	REV NO. 00	DATE OF ISSUE : 24.09.2008	SHEET 5 OF 5
-----------------	------------	----------------------------	--------------

**Torque Vs Speed of 150 MW Generator**



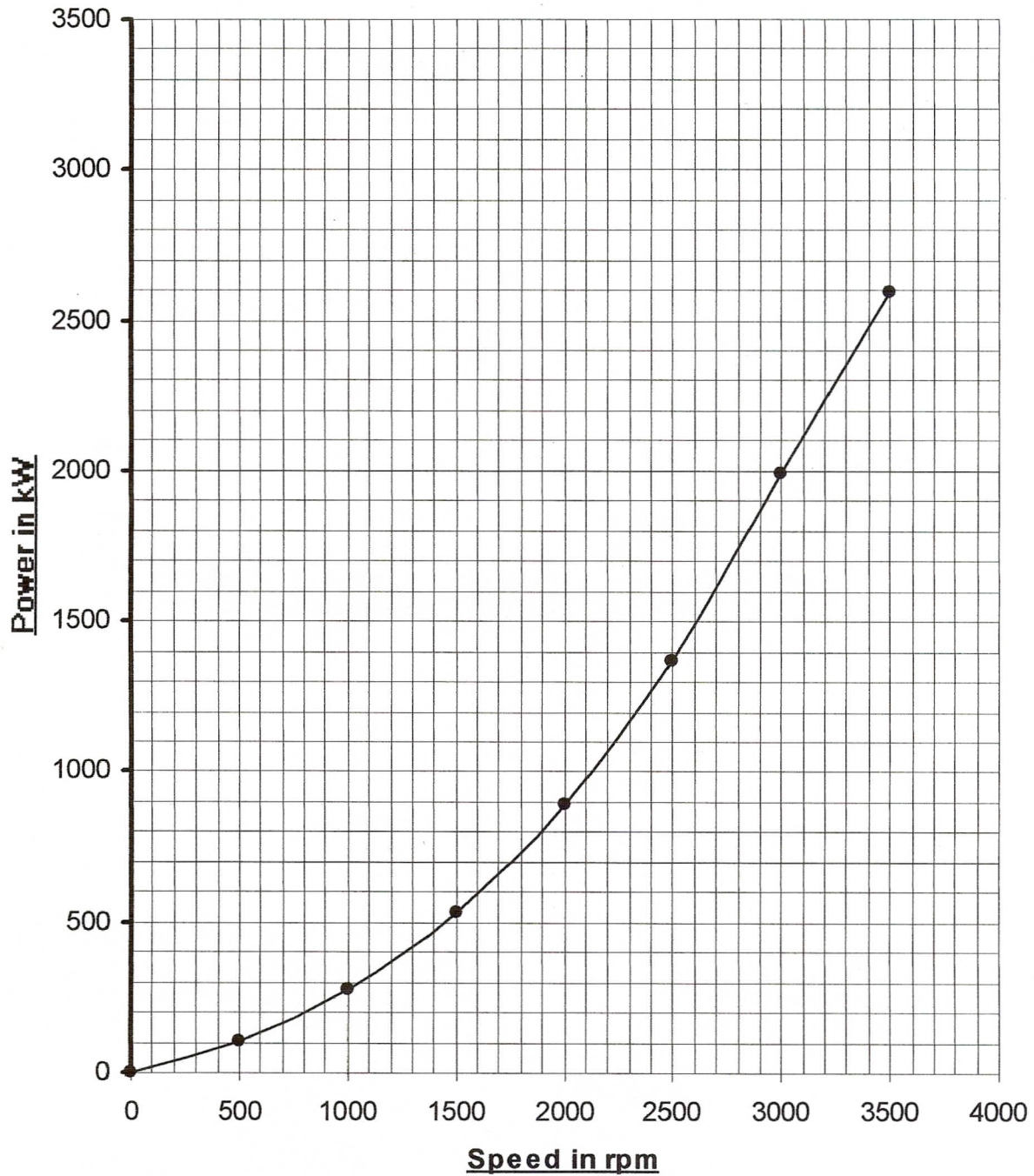


EPD - BANGALORE

**Indent Specifications  
For  
2500 kW DC Motor**

**SPECIFICATION NO.  
EL- 19-2009 / 001**

**Power Vs Speed of 150 MW Generator**



ISSUED BY : EPD

REV NO. 00 DATE OF ISSUE : 24.09.2008

SHEET 7 OF 5