



BHARAT HEAVY ELECTRICALS LIMITED

TRANSMISSION BUSINESS ENGINEERING MANAGEMENT

COPYRIGHT AND CONFIDENTIALITY
The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD.
It must not be used directly or indirectly in anyway detrimental to the interest of the company

DOCUMENT No.	TB-RP800-316-MSROD	Rev. No.	00	Prepared	Checked	Approved
TYPE OF DOC.	TECHNICAL SPECIFICATION			SIGN	<i>T. R. Reddy</i>	<i>Sankar</i>
TITLE	40mm dia MS Rod			NAME	TTR	SKS
				DATE	18/04/16	18/04/16
				GROUP	TBEM	W.O. No
Customer	Power Grid Corporation of India Ltd					
Project	± 800 kV, 6000 MW, HVDC RAIGARH-PUGALUR TERMINALS PROJECT					
LOA NO.						
Station	Raigarh & Pugalur					
Rev No.	Date	Altered	Checked	Approved	Revision Details	
Distribution				To	TBEM	
				Copies	1	



Table of Contents

1	Scope.....	3
1.1	Scope.....	3
1.2	Qualifying requirement	3
2	Equipment Specification	4
2.1	General	4
2.2	Applicable standards.....	4
2.3	Technical requirements.....	4
2.4	Tests	4
3	Project Details & General Technical Requirements.....	5
3.1	General	5
3.2	Definitions.....	5
3.3	Instructions to supplier	5
3.4	Site information	5
3.5	Site temperatures for design purposes.....	6



1 Scope

1.1 Scope

This technical specification covers the requirements of design, manufacture, testing at works, packing, loading at works and transport of 40 mm dia MS Rod to site, required for the underground earthing system.

40mm dia MS rod shall be of length 12 m. The Rod shall be comply with the technical requirements brought out in Section-2 of the specification

The equipment is required for the following project:

Name of customer : Power Grid Corporation of India Ltd (POWERGRID)

Name of the project : ±800 kV, 6000 MW, HVDC Raigarh -Pugalur Terminal Project

Site : Raigarh & Pugalur

Refer section-3 of this document for project details and general specification.

1.2 Qualifying requirement

Bidder must meet following requirement:

1. Bidder must be manufacturer of 40mm dia MS ROD.
2. Bidder must have produced at least 500MT of 40mm dia or higher MS Rod in a single financial year in any one of last 3 financial years.
3. The vendor/manufacturer should be approved vendor of POWERGRID at the time of participating in tender. (It is proposed to put this clause as "on the date of Techno-Commercial opening of this Tender").



2 Equipment Specification

2.1 General

This section covers the general technical requirements of MS Rod. In case of any discrepancies between the requirements mentioned in this section and those specified in other sections of this specification, the latter shall prevail and shall be treated as binding requirement.

2.2 Applicable standards

The conductor to be supplied shall conform to the following Indian Standards :

Specification for Rolling : IS: 1852:1985
And cutting tolerance for
Hot Rolled Steel Products

Steel for General Structural : IS: 2062-2011
Purposes

Round & Square Bars for : IS: 1732-1989
General Engg. Purposes

Standard Specification for
Steel bars, carbon hot wrought
Special Quality : ASTM A576-90b

Note: Latest revisions of all the mentioned standards have to be followed.

2.3 Technical requirements

The material to be supplied shall comply with the requirements specified for Grade-A designation Fe410WA of IS 2062-2011 or grade SAE1018 as per ASTM A576-90b.

The material shall be in sound condition of recent manufacture. The finished product shall be adeptly and cleanly rolled to the dimension and sections specified. The finished material shall be free from defects, loose mill scale, slag, fillings, rust etc. The rod shall be manufactured by hot rolled process.

2.4 Tests

The material shall be subject to all the routine tests as per IS:2062-2011/ASTM A576-90b.

3 Project Details & General Technical Requirements

3.1 General

The Works covered by the Specification shall be designed, manufactured, built, and tested in accordance with the Acts, Rules, Laws and Regulations of India. The Equipment(s) shall also conform to the general requirements detailed in the following standards, which shall form an integral part of the Specification, in addition to meeting the specific requirements called for elsewhere in the Specification.

In case of conflicting requirements between this document (General Technical Requirements -Section 3) and equipment specification (Section 1 & Section 2), equipment specification shall prevail.

Unless specifically agreed to by the Purchaser prior to Award of Contract, the Work shall be in accordance with the standards indicated and the requirements of the Specification. The Supplier shall be held responsible for any deviation.

3.2 Definitions

The following words and expressions shall have the meanings hereby assigned to them throughout this document

"Employer/Owner" means Power Grid Corporation of India Ltd.

"Purchaser" means Bharat Heavy Electricals Limited

"Supplier/Manufacturer" means the person or persons, firm or company assigned to execute the works as defined by the scope of supply, described here.

"Specification" refers to this document.

3.3 Instructions to supplier

The supplier should be approved by Power Grid. If not, it is the responsibility of the vendor to be assessed and approved by Power Grid, before placement of order by BHEL. Any cost involved in vendor assessment/approval must be borne by the vendor himself.

The supplier shall submit the technical requirements, data and information as per the technical data sheets provided in the appropriate clause of bid document.

3.4 Site information

	Particular	Raigarh	Pugalur
a)	Employer/Owner	Power Grid Corporation of India Ltd (POWERGRID)	
b)	Project Title	±800 kV, 6000 MW HVDC Raigarh – Pugalur Terminals	
c)	Location	11 km from Raigarh in State of Chattisgarh. Raigarh is the nearest railway station from Raigarh Site. The nearest Airport is Raigarh. The nearest port to Raigarh site is Paradip, Odisha.	Pugalur site is located about 32 Km from Pugalur in the state of Tamilnadu. The nearest Rail head is Pugalur. The nearest Airport is Coimbatore/ Trichi. The nearest port to Pugalur is Cohin.

	Particular	Raigarh	Pugalur
d)	Nearest Rail Head	Raigarh	Pugalur
e)	Postal Address	To follow	To follow
f)	Design ambient temp.	50°C	50°C
g)	SEISMIC COEFFICIENT	Zone II Importance factor for the stations is 1.5 as per table no. 6 of IS-1893.	Zone II Importance factor for the stations is 1.5 as per table no. 6 of IS-1893.
h)	Site Wind Pressure	Zone II with basic wind speed of 44 m/s at 10 m height above mean ground level. The risk level coefficient/factor shall be taken as 1.07.	Zone V with basic wind speed of 44 m/s at 10 m height above mean ground level. The risk level coefficient/factor shall be taken as 1.07.
i)	Isokeraunic Level	50 days per year	50 days per year
j)	Relative Humidity	Max. 100%	
k)	Rain fall Intensity	In 24 hours: 200cm 80mm/hr (for drainage system Design)	In 24 hours: 1250mm, 50mm/hr (for drainage system Design)
l)	Solar Radiation	83 Cal/cm ² per hour	
m)	Air Pollution	Heavily polluted for Raigarh and Pugalur terminals as per IEC 60815(1986). However leakage distance for AC equipment connected to 400 kV AC bus shall not be less than 10500 mm.	

3.5 Site temperatures for design purposes

The Supplier shall assume the temperatures given below for the design of the works at the converter stations.

Description	Temperature in deg C	
	Raigarh	Pugalur
Maximum dry bulb one hour average	50	50
Maximum dry bulb 24 hour average	40	40
Annual mean dry bulb temperature	30	30
Minimum dry bulb one hour average	0	0
Maximum wet bulb one hour average	33	33
Dry bulb temperature for low ambient condition	33	33
Wet bulb temperature for low ambient condition	23	23