



BHARAT HEAVY ELECTRICALS LIMITED

TRANSMISSION BUSINESS HVDC ENGINEERING & SYSTEMS

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-343-316-FBC	Rev. No.	00	Prepared.	Checked	Approved		
TYPE OF DOC.	TECHNICAL SPECIFICATION			SIGN				
TITLE Flexible Braided Copper conductor				NAME	TTR	SKS		
				DATE	31/01/19	31/01/19		
				GROUP	HVDC	W.O. No		
				AG	31/01/19	86006		
Customer	Power grid Corporation Of India Ltd. (POWERGRID)							
PROJECT	±800kV, 6000MW HVDC Raigarh – Pugalur Terminals							
CA NO.	CC-CS/651-SR2/HVDC-3063/7/G10/CA-I/5817-5821 date: 2017-01-25							
Station	Raigarh & Pugalur							
CONTENTS								
Section	Description					Page No (s)		
1	Scope, Quantities and Specific Technical Requirements					2		
2	Technical Requirement					3		
3	Section 3					3-5		
	Rev No.	Date	Altered	Checked	Approved	REVISION DETAILS		
	Distribution			To	HVDC	TBMM	TBQM	Vendor
				Copies	1	1	1	4

7



SECTION - 1

Scope, Quantities and Specific Technical Requirements

1.1 Scope

This technical specification covers the requirements of design, manufacture at works, packing, loading at works and transport to **Raigarh & Pugalur** sites of complete Flexible braided copper conductor for complete and satisfactory installation at site.

The equipment is required for the following project:

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

Name of the project : ±800kV, 6000MW HVDC Raigarh – Pugalur Terminals

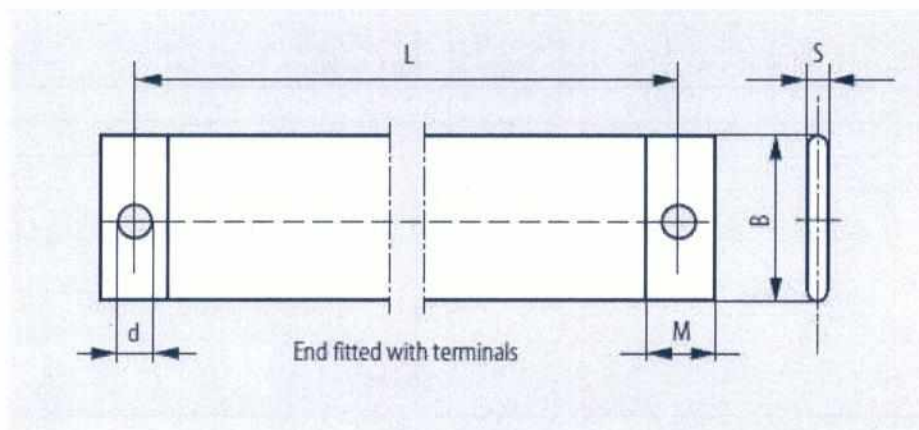
1.2 Quantities (On shore item)

As per enquiry/PI

1.3 Technical Requirements

Flexible braided copper conductor is required to be used and meet the following requirements

- 1) **location** : Isolator/Disconnecter MOM/EOM box and Fence earthing point to 75X12 GS Flat connection
- 2) **Material** : Flexible braided copper tinned
- 3) **Length (L)** : 600mm
- 4) **Width (B)** : 25mm
- 5) **Thickness (S)** : 3 mm
- 6) **Fixing arrangement** : Its shall have tinned copper clamp on each end
- 7) **Tinned copper clamp (d)** : 13mm





Section 2 Technical Requirements

Not applicable

Section 3 Project Details & General Specification

5.1 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.

5.2 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.

5.3 Instructions to supplier

The supplier shall submit the technical requirements, data and information.

5.4 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	



	Particular	Raigarh	Pugalur
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.
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.	

5.5 Site temperatures for design purposes

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

Description Site	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	33	33

4



±800kV, 6000MW HVDC Raigarh – Pugalur Terminals
Flexible Braided Copper Conductor
Doc. No:- TB-343-316-FBC Rev. 00

condition		
Wet bulb temperature for low ambient condition	23	23