## **BHARAT HEAVY ELECTRICALS LIMITED, JHANSI**

### SPECIFICATION CUM COMPLIANCE CERTIFICATE OF L.T.CABLE

# NOTE:

- 1 VENDOR must submit complete information against clause No. 11 ( Qualifying condition). The offer meeting this clause would only be processed.
- The "offered" Column and where applicable, the "Deviations" Column of this format shall be filled in by the Vender and submitted along with the offer. Technical details also submitted with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specification / requirements shall be treated as non compliance.
- 3 The offer and all documents enclosed with offer should be in English language only.

### SCOPE:

# DESIGN, MANUFACTURING, TESTING, PACKING AND SUPPLY OF L.T.CABLE

| S.NO.   | DESCRIPTION FOR BHEL REQUIREMENT  | OFFERED           | DEVIATIONS |
|---------|---|-------------------|------------|
| 1.0     | SCOPE   |                   |            |
| 1.1     | This specification governs the quality requirements of design, manufacturing, testing, packing at supplier works and delivery of L.T.cable complete in all respect. | VENDER TO CONFIRM |            |
| 2.0     | REQUIREMENT   |                   |            |
| 2.1     | Aluminium conductor PVC insulated, PVCsheated overall 1100 volt grade armoured cable confirming to IS 1554 part -I.   | VENDER TO CONFIRM |            |
| 2.1.1   | The required No. of conductor, conductor size and quantity are as below:  | VENDER TO CONFIRM |            |
| 2.1.1.1 | 3 1/2 core x 300 sq. mm Quantity - 4000 meter   | VENDER TO QUOTE   |            |
|         | 3 1/2 core x 185 sq. mm  Quantity - 2000 meter  | VENDER TO QUOTE   |            |
| 2.1.1.2 | 3 1/2 core x 95 sq. mm Quantity - 2000 meter  | VENDER TO QUOTE   |            |
| 2.2.1.3 | 3 1/2 core x 50 sq. mm Quantity - 2000 meter  | VENDER TO QUOTE   |            |
| 2.2     | Copper conductor PVC insulated, PVC sheated overall 1100 volt grade armoured cable confirming to IS 1554 part -I.   | VENDER TO CONFIRM |            |
| 2.2.1   | The required No. of conductor, conductor size and quantity are as below:  | VENDER TO CONFIRM |            |
| 2.2.1.1 | 4 core 2.5 sq. mm Quantity - 7000 meter   | VENDER TO QUOTE   |            |
| 3.0     | APPLICABLE STANDARDS  |                   |            |
| 3.1     | PVC insulated (heavy duty) electric cables part -I for working voltage upto and including 1100 volt - IS 1554 (Part -I)   | VENDER TO CONFIRM |            |
| 3.2     | Conductor for insulated electric cable and flexible cords - IS 8130   | VENDER TO CONFIRM |            |
| 3.3     | PVC insulated and sheat of electric cables - IS 5831  | VENDER TO CONFIRM |            |
| 3.4     | Mild steel formed wires and taps for armouring of cables - IS 3975  | VENDER TO CONFIRM |            |
| 3.5     | Recommended current ratings for cables : part -2 PVC insulated and PVC sheated heavy duty cables - IS 3961 (Part -2)  | VENDER TO CONFIRM |            |
| 3.6     | Specification for hot dip galvanised coating on round steel wires - IS 4826   | VENDER TO CONFIRM |            |
| 3.7     | Wooden drums for electric cables - IS 10418   | VENDER TO CONFIRM |            |
| 3.8     | The cable shall also confirm to the provision of Indian Electricity Rules and other statory requirement as applicable.  | VENDER TO CONFIRM |            |
| 4.0     | CONSTRUCTIONAL REQUIREMENTS   |                   |            |
| 4.1     | Voltage grade : 1100 volt   | VENDER TO CONFIRM |            |
| 4.2     | Conductor : Strandard aluminium conductor as per IS 8130  | VENDER TO CONFIRM |            |
|         | Conductor : Standard EC grade High conductivity Copper class 2 as per IS 8130   | VENDER TO CONFIRM |            |
| 4.4     | Insulation : Extruded PVC type A IS 5831 , Nominal thickness as per IS  | VENDER TO CONFIRM |            |
| 4.5     | Type of cable : Armoured multicore  | VENDER TO CONFIRM |            |

| S.NO. | DESCRIPTION FOR BHEL REQUIREMENT   | OFFERED                           | DEVIATION |  |
|-------|--|-----------------------------------|-----------|--|
| 4.6   | Core identification : as per IS 1554   | VENDER TO CONFIRM                 |           |  |
| 4.7   | Inner sheath : Type ST-1 extruded PVC  | VENDER TO CONFIRM                 |           |  |
|       | Armoured : Armouring shall be as per method (b) of IS 1554 (part-1)  | VENDER TO CONFIRM                 |           |  |
|       | Outer sheath : Type ST-1   | VENDER TO CONFIRM                 |           |  |
|       | TESTS  |                                   |           |  |
| 5.1   |  | VENDED TO CONFIDM                 | 1         |  |
|       | All acceptance and routine test shall be carried out on all cables at vender's works in the presence of BHEL representative. Type test | VENDER TO CONFIRM                 |           |  |
|       | reports of similar cables shall be furnished.  |                                   |           |  |
| 6.0   | GENERAL  |                                   |           |  |
|       | Cable shall be delivered in maximum posible length of not less than 500  | VENDER TO CONFIRM                 |           |  |
| 0.1   | meter length for cable size 3 1/2 core 300 sqmm and 185 sq mm  | & SPECIFY                         |           |  |
|       | cables and not less than 1000 meter length for other required cables.  | a or Lon 1                        |           |  |
|       |  |                                   |           |  |
| 6.2   | Cables shall be neatly rolled on wooden drums (seasoned wood) with   | VENDER TO CONFIRM                 |           |  |
|       | both ends sealed with moisture proof sealing.  |                                   |           |  |
| 6.3   | Sequential marking of the length of the type and size of cable, voltage  | VENDER TO CONFIRM                 |           |  |
|       | grade cable shall be provided on the outer sheath at every one meter.  |                                   |           |  |
|       | The imbossing shall be legible and indelible.  |                                   |           |  |
| 6.4   | On the flange of the drum necessary information such as  | VENDER TO CONFIRM                 |           |  |
|       | manufacturer's name, type , size, voltage grade, length of the cable   |                                   |           |  |
|       | shall be printed. An arrow shall be printed on the drum with suitable  |                                   |           |  |
|       | instructions to show the direction of rotation of the drum.  |                                   |           |  |
|       | DOCUMENTATIONS   |                                   |           |  |
| 7.1   | Technical data sheet in given format only (refer specification point No.   | VENDER TO SUBMIT                  |           |  |
|       | 8.0)   |                                   |           |  |
|       | QAP shall be furnished along with the offer  | VENDER TO SUBMIT                  |           |  |
| 7.3   | Final data sheet after BHEL Purchase Order   | VENDER TO CONFIRM                 |           |  |
| 7.4   | 3 copies of test certificates and technical data sheets with in one week   | VENDER TO CONFIRM                 |           |  |
|       | after inspection   |                                   |           |  |
|       | TECHNICAL DATA SHEETS:   |                                   |           |  |
|       | Make   | VENDER TO SUBMIT                  |           |  |
|       | Type   | VENDER TO SUBMIT                  |           |  |
|       | Applicable Standrad  | VENDER TO SUBMIT                  |           |  |
|       | Voltage grade Suitable for system with:  | VENDER TO SUBMIT VENDER TO SUBMIT |           |  |
|       | •  | VENDER TO SUBMIT                  |           |  |
|       | a) Service voltage     b) Nature earthed/ unearthed  | VENDER TO SUBMIT                  |           |  |
| 8.6   | Maximum conductor temp.  | VENDER TO SUBMIT                  |           |  |
|       | a) Continuous Deg. C   | VENDER TO SUBMIT                  |           |  |
|       | b) Short Deg. C  | VENDER TO SUBMIT                  |           |  |
|       | Conductor  | VENDER TO SUBMIT                  |           |  |
|       | a) Material  | VENDER TO SUBMIT                  |           |  |
|       | b) Size (SQ. mm)   | VENDER TO SUBMIT                  |           |  |
|       | c) No.of wires & diameter of each wire (No/mm)   | VENDER TO SUBMIT                  |           |  |
| 8.8   | Insulation   | VENDER TO SUBMIT                  |           |  |
|       | a) Material  | VENDER TO SUBMIT                  |           |  |
|       | b) Type  | VENDER TO SUBMIT                  |           |  |
| 0.0   | c) Thickness (nominal) mm  | VENDER TO SUBMIT                  |           |  |
| 8.9   | Inner sheath a) Material   | VENDER TO SUBMIT                  |           |  |
|       | b) Type  | VENDER TO SUBMIT VENDER TO SUBMIT |           |  |
|       | c) Thickness (nominal) mm  | VENDER TO SUBMIT                  |           |  |
|       | d) Extruded Yes/ No  | VENDER TO SUBMIT                  |           |  |
|       | e) Approx. outside dia over inner sheath mm.   | VENDER TO SUBMIT                  |           |  |
|       | Armouring  | VENDER TO SUBMIT                  |           |  |

| S.NO.II                         | DESCRIPTION FOR BHE  | L REQUIREMENT   | OFFERED           | DEVIATIONS |
|---------------------------------|--|---|-------------------|------------|
|                                 | a) Material  |   | VENDER TO SUBMIT  | DEVIATION  |
|                                 | o) Size  |   | VENDER TO SUBMIT  |            |
|                                 | c) DC resistance at 20 deg   | uree C (Ohm/km)   | VENDER TO SUBMIT  |            |
|                                 | Overall sheath   | rice o (Olimiran)   | VENDER TO SUBMIT  |            |
|                                 | a) Material  |   | VENDER TO SUBMIT  |            |
|                                 | o) Type  |   | VENDER TO SUBMIT  |            |
|                                 | c) Thickness (nominal) mn  | 1   | VENDER TO SUBMIT  |            |
|                                 | Approx. overall diameter (i  |   | VENDER TO SUBMIT  |            |
|                                 | Standard drum length with  | •   | VENDER TO SUBMIT  |            |
|                                 | Net weight of cable (Kg/ K   |   | VENDER TO SUBMIT  |            |
|                                 |  | or standard IS condition laid direct :Amps  | VENDER TO SUBMIT  |            |
|                                 |  | of Standard 10 condition laid direct 17 trips   |                   |            |
|                                 | a) In ground   |   | VENDER TO SUBMIT  |            |
|                                 | o) In duct   |   | VENDER TO SUBMIT  |            |
|                                 | c) In air  |   | VENDER TO SUBMIT  |            |
|                                 | Short circuit current for -I s                                       |   | VENDER TO SUBMIT  |            |
| 8.17 E                          | Electrical parameters at m   | aximum operating temp.(ohm/km)  | VENDER TO SUBMIT  |            |
| a                               | a) Resistance  |   | VENDER TO SUBMIT  |            |
| b                               | o) Reactance at 50 hz  |   | VENDER TO SUBMIT  |            |
|                                 | c) Impedence   |   | VENDER TO SUBMIT  |            |
| 8.18 F                          | Recommended minimum I  | pending radius  | VENDER TO SUBMIT  |            |
| 8.19                            | Dearating factor for followi   | ng ambient temp. in air ground.   | VENDER TO SUBMIT  |            |
| a                               | a) At 30° C  |   | VENDER TO SUBMIT  |            |
| t                               | o) At 35° C  |   | VENDER TO SUBMIT  |            |
| c                               | c) At 45 ° C   |   | VENDER TO SUBMIT  |            |
| c                               | d) At 50 ° C   |   | VENDER TO SUBMIT  |            |
|                                 | Cable identification code  |   | VENDER TO SUBMIT  |            |
| 8.21 L                          | ist of routine and type tes  | ts certificates enclosed.   | VENDER TO SUBMIT  |            |
|                                 | NSPECTION AND TESTI  |   |                   |            |
|                                 |  | ables shall be done at manufacturer works.  | VENDER TO CONFIRM |            |
|                                 | •  | on shall be given so that BHEL representative   | VENDER TO CONFIRM |            |
|                                 | can be deputed for inspec  | tion and testing.   |                   |            |
| 10.0                            | GUARANTEE  |   |                   |            |
|                                 | The cable shall be guaran<br>from the date of receipt.               | ted for satisfactory operation of 24 months   | VENDER TO CONFIRM |            |
|                                 | QUALIFYING CONDITION   | N .   |                   |            |
| 11.1 (                          | Only those vender, who ar  | e in the line of cable manufacturing or   | VENDER TO SUBMIT  |            |
|                                 |  | manufacturer shall quote. The following   |                   |            |
|                                 | •  | mitted with the offer. This is required from  |                   |            |
|                                 | enders for qualifications  |   |                   |            |
|                                 |  | cturer and company profile  | VENDER TO SUBMIT  |            |
|                                 | Details of manufacturing facilities available at manufacturer works. |   | VENDER TO SUBMIT  |            |
| 11.4                            | Details of test facilities ava                                       | ilable at manufacturer works.   | VENDER TO SUBMIT  |            |
| 11.5 BHEL reserves the right to |  | verify information submited by vender. In nd to be false/ incorrect, the offer shall be | VENDER TO CONFIRM |            |
|                                 |  |   |                   |            |
|                                 | Sujeet Srivastava  | Inder Mathur  | S.J.Chakrabo      |            |
|                                 | . Manager (WE&S)   | Sr. Manager (WE&S)  | Sr. DGM (WE       | (&S)       |