

Ref: PW/PE/CMM-PVC Cables Packages (Rev-02)

Dated:19/02/2019

Note: Applicable for cable tenders released on or after 14/01/2019.

**Price Variation Formulae for cables -Annexure-I**

1. Prices shall be variable as per price variation formulae given below (basis IEEMA).  
The price variation shall be limited to + 20% of total ex-works price actually supplied (cable size wise) and -ve price variation shall be unlimited. Rates for working out price variation shall be as per rates published by IEEMA for the factors given in Annexure-II

**2. Base date for prices:**

**Initial Price (As per IEEMA) for-Alo, Cuo, CCo, PVCCo & Feo:**

Base Date shall be- 1<sup>st</sup> working day of the previous month to the date of issue of tender enquiry.

**Final Price (as per IEEMA) for- Al, Cu, Cc, PVCC & Fe:**

1<sup>st</sup> working day of month, one month prior to the date on which cable is notified as being ready for inspection i.e TPIA inspection call raise date on web portal.

3. Variation factor value for ALF, CuF, CCFAL, CCFCu, XLFAL, XLFCu, FeF & FeW as applicable shall be as per Technical Specification.

4. PVC shall be payable within contractual delivery period (including any extension thereto).

**IEEMA table for Price variation cause for various type of cable**

**1. Aluminium conductor cable**

| S.No | Cable Type                 | AIF<br>(Single core<br>unarmoured & Multi<br>core<br>armoured) | AIF<br>(Single<br>core<br>armoured) | CCFAI | XLFAL<br>(Single<br>core) | XLFAL<br>(Multi<br>core) | FeF | FeW                | IEEMA Formula                                                                     |
|------|----------------------------|----------------------------------------------------------------|-------------------------------------|-------|---------------------------|--------------------------|-----|--------------------|-----------------------------------------------------------------------------------|
| 1.   | HT XLPE<br>Power<br>cable  | ALP                                                            | H1                                  | H2    | XL3                       | XL4                      | H3  | H5                 | $P = P_o + AIF(AL - Alo) + XLFAL(CC - CCo) + CCFAI(PVCC - PVCCo) + FeF(Fe - Feo)$ |
| 2.   | LT XLPE<br>Power<br>Cable  | ALP                                                            | P1                                  | L2    | XL1                       | XL1                      | P3  | P3<br>(Additional) | $P = P_o + AIF(AL - Alo) + XLFAL(CC - CCo) + CCFAI(PVCC - PVCCo) + FeF(Fe - Feo)$ |
| 3.   | LT PVC<br>Power<br>Cable   | ALP                                                            | P1                                  | P2    | -                         | -                        | P3  | P3<br>(Additional) | $P = P_o + AIF(AL - Alo) + CCFAI(PVCC - PVCCo) + FeF(Fe - Feo)$                   |
| 4.   | LT HRPVC<br>Power<br>Cable | ALP                                                            | P1                                  | P2    | -                         | -                        | P3  | P3<br>(Additional) | $P = P_o + AIF(AL - Alo) + CCFAI(PVCC - PVCCo) + FeF(Fe - Feo)$                   |

**2. Copper conductor cable**

| S no. | Cable type             | CuF | AIF<br>(single<br>core<br>armoured) | CCFCu | XLFCU<br>(Single<br>core) | XLFCU<br>(Multi<br>core) | FeF | FeW                | IEEMA Formula                                                                                     |
|-------|------------------------|-----|-------------------------------------|-------|---------------------------|--------------------------|-----|--------------------|---------------------------------------------------------------------------------------------------|
| 1     | HT XLPE<br>Power cable | CUP | H4                                  | H2    | XL3                       | XL4                      | H3  | H5                 | $P = P_o + CuF(Cu - Cuo) + XLFCU(CC - CCo) + CCFCu(PVCC - PVCCo) + FeF(Fe - Feo) + AIF(AL - Alo)$ |
| 2     | LT XLPE<br>Power Cable | CUP | P4                                  | L2    | XL1                       | XL1                      | P3  | P3<br>(Additional) | $P = P_o + CuF(Cu - Cuo) + XLFCU(CC - CCo) + CCFCu(PVCC - PVCCo) + FeF(Fe - Feo) + AIF(AL - Alo)$ |

| S no. | Cable type                              | CuF    | AIF (single core armoured) | CCFCu | XLFCU (Single core) | XLFCU (Multi core) | FeF    | FeW             | IEEMA Formula                                                                       |
|-------|-----------------------------------------|--------|----------------------------|-------|---------------------|--------------------|--------|-----------------|-------------------------------------------------------------------------------------|
| 3     | LT PVC Power Cable                      | CUP    | P4                         | P2    | --                  | --                 | P3     | P3 (Additional) | $P=Po+CuF(Cu-Cuo) + CCFCu (PVCC-PVCCo) + FeF(Fe-Feo) + AIF(AL-Alo)$                 |
| 4     | LT HRPVC Power Cable                    | CUP    | P4                         | P2    | --                  | --                 | P3     | P3 (Additional) | $P=Po+CuF(Cu-Cuo) + CCFCu (PVCC-PVCCo) + FeF(Fe-Feo) + AIF(AL-Alo)$                 |
| 5     | LT XLPE Control Cable                   | CUC    | --                         | P5    | --                  | XL2                | P6     | P6 (Additional) | $P=Po+CuF(Cu-Cuo) + XLFCU(CC-CCo) + CCFCu (PVCC-PVCCo) + FeF(Fe-Feo)$               |
| 6     | LT PVC Control Cable                    | CUC    | --                         | P5    | --                  | --                 | P6     | P6 (Additional) | $P=Po+CuF(Cu-Cuo) + CCFCu (PVCC-PVCCo) + FeF(Fe-Feo)$                               |
| 7     | LT HRPVC Control Cable                  | CUC    | --                         | P5    | --                  | --                 | P6     | P6 (Additional) | $P=Po+CuF(Cu-Cuo) + CCFCu (PVCC-PVCCo) + FeF(Fe-Feo)$                               |
| 8     | LT XLPE Fire Survival Power Cable       | CUP    | P4                         | L2    | XL1                 | XL1                | P3     | P3 (Additional) | $P=Po+CuF(Cu-Cuo) + XLFCU(CC-CCo) + CCFCu (PVCC-PVCCo) + FeF(Fe-Feo) + AIF(AL-Alo)$ |
| 9     | LT XLPE Fire Survival Control           | CUC    | --                         | P5    | --                  | XL2                | P6     | P6 (Additional) | $P=Po+CuF(Cu-Cuo) + XLFCU(CC-CCo) + CCFCu (PVCC-PVCCo) + FeF(Fe-Feo)$               |
| 10    | LT EPR Fire Survival Power Cable        | CUP    | P4                         | L2    | --                  | --                 | P3     | P3 (Additional) | $P=Po+CuF(Cu-Cuo) + CCFCu (PVCC-PVCCo) + FeF(Fe-Feo) + AIF(AL-Alo)$                 |
| 11    | LT EPR Fire Survival Control cable      | CUC    | --                         | P5    | --                  | --                 | P6     | P6 (Additional) | $P=Po+CuF(Cu-Cuo) + CCFCu (PVCC-PVCCo) + FeF(Fe-Feo)$                               |
| 12    | Screened control Cable (Overall screen) | Cu POS | --                         | --    | --                  | --                 | Fe POS | Fe POS          | $P=Po+CuF(Cu-Cuo) + FeF(Fe-Feo)$                                                    |
| 13    | Screened control Cable (Individual      | Cu PIS | --                         | --    | --                  | --                 | Fe PIS | Fe PIS          | $P=Po+CuF(Cu-Cuo) + FeF(Fe-Feo)$                                                    |

**IEEMA Table for Price Variation Clause for various types of Cables****Notes:-**

- (i) Cu POS, Cu PIS, Fe POS & Fe PIS tables shall be as per IEEMA circular No. IEEMA (PVC) /Instrumentation Cable/2014 effective from dtd 01.07.2014.
- (ii) All other tables shall be as per IEEMA circular No. 35//DIV/CAB/05/ dated 24.04.2018.

**Terms used in PVC formulae:**

P = Price payable as adjusted in accordance with above appropriate formula (In Rs./Km).  
 Po= Price quoted/confined (in Rs./km).

**1. ALUMINIUM**

ALF Variation factor for aluminium.  
 Al =Price of aluminium.  
 Alo = Price of aluminium.

**2 COPPER**

CuF =Variation factor for copper.  
 Cu = Price of CC copper rods.  
 Cuo = Price of CC copper rods.

**3.PVCc COMPOUND/POLYMER**

PVCc = Price of PVC compound.  
 PVCco= Price of PVC compound.  
 CCFAL= Variation factor for PVC compound/Polymer for aluminium conductor cable.  
 CCFcu =Variation factor for PVC compound/Polymer for copper conductor cable.

**4. XLPE COMPOUND**

Cc = Price of XLPE compound.  
 Cco= Price of XLPE compound.  
 XLFAL= Variation factor for XLPE compound for aluminium conductor cable.  
 XLFCu =Variation factor for XLPE compound for copper conductor cable.

**5.STEEL**

Fe= Price of steel strips/steel wire.  
 Feo= Price of steel strips/steel wire.  
 FeF =Variation factor for steel.  
 FeW=Variation factor for round wire steel armouring.



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IEEMA (PVC)/Instrumentation Cable/2014

Effective from: 1<sup>st</sup> July 2014

#### Material Price Variation Clause For Instrumentation Cables

The Price quoted/confirmed is based on the input cost of raw materials/components as on the date of quotation, and the same is deemed to be related to the prices of raw materials as specified in the price variation clause given below. In case of any variation in these prices, the price payable shall be subject to adjustment up or down in accordance with the formulae provided in this document.

Terms used in price variation formulae:

P Price payable as adjusted in accordance with above appropriate formula (in Rs/Km)

Po Price quoted/confirmed (in Rs/Km)

#### COPPER

CuF Variation factor for copper

Cu Price of CC copper rods. This price is as applicable on first working day of the month, one month prior to the date of delivery.

Cu<sub>o</sub> Price of CC copper rods. This price is as applicable on first working day of the month, one month prior to the date of tendering.

#### STEEL

FeF Variation factor for steel

Fe Price of Steel Strips/steel wire. This price is as applicable on the first working day of the month, one month prior to the date of delivery.

Fe<sub>o</sub> Price of steel strips/steel wire. This price is as applicable on first working day of the month, one month prior to the date of tendering.

The above prices and indices are as published by IEEMA vide Circular reference IEEMA(PVC)/CABLE/--/- prevailing as on 1<sup>st</sup> working day of the month i.e. one month prior to the date of tendering.

The date of delivery is the date on which the cable is notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Page 1 of 2

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Indian Electrical & Electronics Manufacturers' Association

**IEEMA (PVC)/Instrumentation Cable/2014**

**Effective from: 1<sup>st</sup> July 2014**

**Notes**

- (a) All prices of raw materials are exclusive of modvatable excise/CV duty amount and exclusive of any other central, state or local taxes, octroi, etc.
- (b) All Prices are as on first working day of the month.
- (c) The details of prices are as under:
  - 1. Price of CC copper rods (in Rs/MT) is ex-works price as quoted by the primary producer.
  - 2. Price of galvanized steel strip / steel wire (in Rs/MT) is ex-works price as quoted by the manufacturer for Round steel Wire and Flat steel strip (the relevant price of steel strip or steel wire is to be selected depending upon the type of armouring of the cable).

**Price variation formula for 'Instrumentation Cables'**

$$P = P_o + CuF (Cu - Cu_o) + FeF (Fe - Fe_o)$$

**1. For Pair Instrumentation Over all Screen Cables**

Tables References:

Cu POS      Copper Factor  
Fe POS      Steel Factor

**2. For Pair Instrumentation Individual and Over all Screen Cables**

Tables References:

Cu PIS      Copper Factor  
Fe PIS      Steel Factor

**3. For Triad Instrumentation Over all Screen Cables**

Tables References:

Cu TOS      Copper Factor  
Fe TOS      Steel Factor

**4. For Triad Instrumentation Individual & Overall Screen Cables**

Tables References:

Cu TIS      Copper Factor  
Fe TIS      Steel Factor

  
**Deputy Director General**  
Page 2 of 2

## Copper Factors for Instrumentation Cables - CuF

### Cu POS

| Pair Instrumentation Over all Screen Cables |           |            |           |           |           |
|---------------------------------------------|-----------|------------|-----------|-----------|-----------|
| No. of Pairs<br>Cable size in<br>sq.mm      | 0.5 sq.mm | 0.75 sq.mm | 1.0 sq.mm | 1.5 sq.mm | 2.5 sq.mm |
| 1                                           | 0.0142    | 0.0185     | 0.0233    | 0.0326    | 0.0500    |
| 2                                           | 0.0258    | 0.0345     | 0.0440    | 0.0625    | 0.0978    |
| 3                                           | 0.0353    | 0.0484     | 0.0626    | 0.0904    | 0.1433    |
| 4                                           | 0.0448    | 0.0623     | 0.0811    | 0.1183    | 0.1888    |
| 5                                           | 0.0578    | 0.0800     | 0.1022    | 0.1467    | 0.2356    |
| 6                                           | 0.0662    | 0.0926     | 0.1210    | 0.1768    | 0.2829    |
| 7                                           | 0.0756    | 0.1067     | 0.1378    | 0.2000    | 0.3245    |
| 8                                           | 0.0852    | 0.1204     | 0.1582    | 0.2327    | 0.3741    |
| 9                                           | 0.0933    | 0.1334     | 0.1734    | 0.2534    | 0.4134    |
| 10                                          | 0.1046    | 0.1485     | 0.1959    | 0.2893    | 0.4665    |
| 11                                          | 0.1111    | 0.1600     | 0.2089    | 0.3067    | 0.5023    |
| 12                                          | 0.1236    | 0.1764     | 0.2333    | 0.3452    | 0.5580    |
| 13                                          | 0.1289    | 0.1867     | 0.2445    | 0.3600    | 0.5912    |
| 14                                          | 0.1378    | 0.2000     | 0.2623    | 0.3867    | 0.6356    |
| 15                                          | 0.1467    | 0.2134     | 0.2800    | 0.4134    | 0.6801    |
| 16                                          | 0.1618    | 0.2322     | 0.3080    | 0.4573    | 0.7409    |
| 17                                          | 0.1645    | 0.2400     | 0.3156    | 0.4667    | 0.7690    |
| 18                                          | 0.1734    | 0.2534     | 0.3334    | 0.4934    | 0.8134    |
| 19                                          | 0.1822    | 0.2667     | 0.3512    | 0.5201    | 0.8579    |
| 20                                          | 0.1911    | 0.2800     | 0.3689    | 0.5467    | 0.9023    |
| 21                                          | 0.2000    | 0.2934     | 0.3867    | 0.5734    | 0.9468    |
| 22                                          | 0.2089    | 0.3067     | 0.4045    | 0.6001    | 0.9912    |
| 23                                          | 0.2178    | 0.3200     | 0.4223    | 0.6267    | 1.0357    |
| 24                                          | 0.2381    | 0.3437     | 0.4575    | 0.6813    | 1.1068    |
| 25                                          | 0.2356    | 0.3467     | 0.4578    | 0.6801    | 1.1246    |
| 26                                          | 0.2445    | 0.3600     | 0.4756    | 0.7068    | 1.1690    |
| 27                                          | 0.2534    | 0.3734     | 0.4934    | 0.7334    | 1.2135    |
| 28                                          | 0.2623    | 0.3867     | 0.5112    | 0.7601    | 1.2579    |
| 29                                          | 0.2711    | 0.4001     | 0.5290    | 0.7868    | 1.3024    |
| 30                                          | 0.2800    | 0.4134     | 0.5467    | 0.8134    | 1.3468    |
| 31                                          | 0.2889    | 0.4267     | 0.5645    | 0.8401    | 1.3913    |
| 32                                          | 0.2978    | 0.4401     | 0.5823    | 0.8668    | 1.4357    |
| 33                                          | 0.3067    | 0.4534     | 0.6001    | 0.8934    | 1.4802    |
| 34                                          | 0.3156    | 0.4667     | 0.6179    | 0.9201    | 1.5246    |
| 35                                          | 0.3245    | 0.4801     | 0.6356    | 0.9468    | 1.5691    |
| 36                                          | 0.3334    | 0.4934     | 0.6534    | 0.9735    | 1.6135    |
| 37                                          | 0.3423    | 0.5067     | 0.6712    | 1.0001    | 1.6580    |
| 38                                          | 0.3512    | 0.5201     | 0.6890    | 1.0268    | 1.7024    |
| 39                                          | 0.3600    | 0.5334     | 0.7068    | 1.0535    | 1.7469    |
| 40                                          | 0.3689    | 0.5467     | 0.7245    | 1.0801    | 1.7913    |
| 41                                          | 0.3778    | 0.5601     | 0.7423    | 1.1068    | 1.8358    |
| 42                                          | 0.3867    | 0.5734     | 0.7601    | 1.1335    | 1.8802    |
| 43                                          | 0.3956    | 0.5867     | 0.7779    | 1.1601    | 1.9247    |
| 44                                          | 0.4045    | 0.6001     | 0.7957    | 1.1868    | 1.9691    |
| 45                                          | 0.4134    | 0.6134     | 0.8134    | 1.2135    | 2.0136    |
| 46                                          | 0.4223    | 0.6267     | 0.8312    | 1.2402    | 2.0580    |
| 47                                          | 0.4312    | 0.6401     | 0.8490    | 1.2668    | 2.1025    |
| 48                                          | 0.4710    | 0.6759     | 0.9010    | 1.3410    | 2.2009    |

## Copper Factors for Instrumentation Cables - CuF

### Cu PIS

| Pair Instrumentation Individual and Over all Screen Cables |           |            |           |           |           |
|------------------------------------------------------------|-----------|------------|-----------|-----------|-----------|
| No. of Pairs<br>Cable size in<br>sq.mm                     | 0.5 sq.mm | 0.75 sq.mm | 1.0 sq.mm | 1.5 sq.mm | 2.5 sq.mm |
| 1                                                          | 0.0133    | 0.0178     | 0.0222    | 0.0311    | 0.0489    |
| 2                                                          | 0.0349    | 0.0437     | 0.0531    | 0.0717    | 0.1069    |
| 3                                                          | 0.0490    | 0.0621     | 0.0763    | 0.1041    | 0.1570    |
| 4                                                          | 0.0630    | 0.0806     | 0.0994    | 0.1389    | 0.2071    |
| 5                                                          | 0.0800    | 0.1022     | 0.1245    | 0.1689    | 0.2578    |
| 6                                                          | 0.0937    | 0.1200     | 0.1484    | 0.2042    | 0.3103    |
| 7                                                          | 0.1067    | 0.1378     | 0.1689    | 0.2311    | 0.3556    |
| 8                                                          | 0.1218    | 0.1569     | 0.1948    | 0.2692    | 0.4107    |
| 9                                                          | 0.1334    | 0.1734     | 0.2134    | 0.2934    | 0.4534    |
| 10                                                         | 0.1503    | 0.1943     | 0.2417    | 0.3349    | 0.5122    |
| 11                                                         | 0.1600    | 0.2089     | 0.2578    | 0.3556    | 0.5512    |
| 12                                                         | 0.1785    | 0.2313     | 0.2882    | 0.4001    | 0.6128    |
| 13                                                         | 0.1867    | 0.2445     | 0.3023    | 0.4178    | 0.6490    |
| 14                                                         | 0.2000    | 0.2623     | 0.3245    | 0.4489    | 0.6979    |
| 15                                                         | 0.2134    | 0.2800     | 0.3467    | 0.4801    | 0.7468    |
| 16                                                         | 0.2350    | 0.3053     | 0.3812    | 0.5305    | 0.8141    |
| 17                                                         | 0.2400    | 0.3156     | 0.3912    | 0.5423    | 0.8446    |
| 18                                                         | 0.2534    | 0.3334     | 0.4134    | 0.5734    | 0.8934    |
| 19                                                         | 0.2667    | 0.3512     | 0.4356    | 0.6045    | 0.9423    |
| 20                                                         | 0.2800    | 0.3689     | 0.4578    | 0.6356    | 0.9912    |
| 21                                                         | 0.2934    | 0.3867     | 0.4801    | 0.6668    | 1.0401    |
| 22                                                         | 0.3067    | 0.4045     | 0.5023    | 0.6979    | 1.0890    |
| 23                                                         | 0.3200    | 0.4223     | 0.5245    | 0.7290    | 1.1379    |
| 24                                                         | 0.3479    | 0.4535     | 0.5673    | 0.7911    | 1.2165    |
| 25                                                         | 0.3467    | 0.4578     | 0.5690    | 0.7912    | 1.2357    |
| 26                                                         | 0.3600    | 0.4756     | 0.5912    | 0.8223    | 1.2846    |
| 27                                                         | 0.3734    | 0.4934     | 0.6134    | 0.8534    | 1.3335    |
| 28                                                         | 0.3867    | 0.5112     | 0.6356    | 0.8846    | 1.3824    |
| 29                                                         | 0.4001    | 0.5290     | 0.6579    | 0.9157    | 1.4313    |
| 30                                                         | 0.4134    | 0.5467     | 0.6801    | 0.9468    | 1.4802    |
| 31                                                         | 0.4267    | 0.5645     | 0.7023    | 0.9779    | 1.5291    |
| 32                                                         | 0.4401    | 0.5823     | 0.7245    | 1.0090    | 1.5780    |
| 33                                                         | 0.4534    | 0.6001     | 0.7468    | 1.0401    | 1.6269    |
| 34                                                         | 0.4667    | 0.6179     | 0.7690    | 1.0712    | 1.6758    |
| 35                                                         | 0.4801    | 0.6356     | 0.7912    | 1.1024    | 1.7247    |
| 36                                                         | 0.4934    | 0.6534     | 0.8134    | 1.1335    | 1.7736    |
| 37                                                         | 0.5067    | 0.6712     | 0.8357    | 1.1646    | 1.8225    |
| 38                                                         | 0.5201    | 0.6890     | 0.8579    | 1.1957    | 1.8713    |
| 39                                                         | 0.5334    | 0.7068     | 0.8801    | 1.2268    | 1.9202    |
| 40                                                         | 0.5467    | 0.7245     | 0.9023    | 1.2579    | 1.9691    |
| 41                                                         | 0.5601    | 0.7423     | 0.9246    | 1.2891    | 2.0180    |
| 42                                                         | 0.5734    | 0.7601     | 0.9468    | 1.3202    | 2.0669    |
| 43                                                         | 0.5867    | 0.7779     | 0.9690    | 1.3513    | 2.1158    |
| 44                                                         | 0.6001    | 0.7957     | 0.9912    | 1.3824    | 2.1647    |
| 45                                                         | 0.6134    | 0.8134     | 1.0135    | 1.4135    | 2.2136    |
| 46                                                         | 0.6267    | 0.8312     | 1.0357    | 1.4446    | 2.2625    |
| 47                                                         | 0.6401    | 0.8490     | 1.0579    | 1.4757    | 2.3114    |
| 48                                                         | 0.6887    | 0.8936     | 1.1186    | 1.5587    | 2.4186    |

| Steel Factors for Instrumentation Cables - FeF |           |            |           |           |           |
|------------------------------------------------|-----------|------------|-----------|-----------|-----------|
| Fe POS                                         |           |            |           |           |           |
| Pair Instrumentation Over all Screen Cables    |           |            |           |           |           |
| No. of Pairs<br>Cable size in<br>sq.mm         | 0.5 sq.mm | 0.75 sq.mm | 1.0 sq.mm | 1.5 sq.mm | 2.5 sq.mm |
| 1                                              | 0.1490    | 0.1565     | 0.1635    | 0.1735    | 0.1930    |
| 2                                              | 0.2190    | 0.2335     | 0.2470    | 0.2665    | 0.2595    |
| 3                                              | 0.2360    | 0.2545     | 0.2690    | 0.2900    | 0.2680    |
| 4                                              | 0.2390    | 0.2580     | 0.2715    | 0.2945    | 0.2830    |
| 5                                              | 0.2630    | 0.2820     | 0.2420    | 0.2805    | 0.3155    |
| 6                                              | 0.2840    | 0.3160     | 0.2805    | 0.2995    | 0.3430    |
| 7                                              | 0.2840    | 0.2595     | 0.2805    | 0.2995    | 0.3430    |
| 8                                              | 0.3235    | 0.2930     | 0.3030    | 0.3315    | 0.3780    |
| 9                                              | 0.2805    | 0.3180     | 0.3290    | 0.3590    | 0.4205    |
| 10                                             | 0.2970    | 0.3215     | 0.3455    | 0.3755    | 0.4385    |
| 11                                             | 0.3005    | 0.3255     | 0.3490    | 0.3805    | 0.4435    |
| 12                                             | 0.3065    | 0.3440     | 0.3680    | 0.3880    | 0.4520    |
| 13                                             | 0.3265    | 0.3530     | 0.3780    | 0.4105    | 0.4785    |
| 14                                             | 0.3265    | 0.3530     | 0.3780    | 0.4105    | 0.4785    |
| 15                                             | 0.3490    | 0.3765     | 0.4015    | 0.4365    | 0.5195    |
| 16                                             | 0.3490    | 0.3765     | 0.4015    | 0.4365    | 0.5195    |
| 17                                             | 0.3590    | 0.4005     | 0.4140    | 0.4635    | 0.5470    |
| 18                                             | 0.3590    | 0.4005     | 0.4265    | 0.4635    | 0.5470    |
| 19                                             | 0.3590    | 0.4005     | 0.4265    | 0.4635    | 0.5470    |
| 20                                             | 0.3830    | 0.4240     | 0.4535    | 0.4920    | 0.5760    |
| 21                                             | 0.3830    | 0.4240     | 0.4535    | 0.4920    | 0.5760    |
| 22                                             | 0.4065    | 0.4520     | 0.4785    | 0.5310    | 0.6190    |
| 23                                             | 0.4065    | 0.4520     | 0.4810    | 0.5310    | 0.6190    |
| 24                                             | 0.4305    | 0.4770     | 0.5070    | 0.5595    | 0.6475    |
| 25                                             | 0.4305    | 0.4770     | 0.5070    | 0.5595    | 0.6475    |
| 26                                             | 0.4305    | 0.4770     | 0.5070    | 0.5595    | 0.6475    |
| 27                                             | 0.4355    | 0.4820     | 0.5245    | 0.5660    | 0.6700    |
| 28                                             | 0.4570    | 0.5045     | 0.5345    | 0.5895    | 0.6950    |
| 29                                             | 0.4570    | 0.5045     | 0.5345    | 0.5895    | 0.6950    |
| 30                                             | 0.4570    | 0.5045     | 0.5345    | 0.5895    | 0.6950    |
| 31                                             | 0.4795    | 0.5285     | 0.5595    | 0.6150    | 0.7225    |
| 32                                             | 0.4820    | 0.5285     | 0.5595    | 0.6150    | 0.7225    |
| 33                                             | 0.4820    | 0.5285     | 0.5595    | 0.6150    | 0.7225    |
| 34                                             | 0.4920    | 0.5520     | 0.5835    | 0.6410    | 0.7500    |
| 35                                             | 0.4920    | 0.5520     | 0.5835    | 0.6410    | 0.7500    |
| 36                                             | 0.4920    | 0.5520     | 0.5835    | 0.6410    | 0.7500    |
| 37                                             | 0.4920    | 0.5520     | 0.5835    | 0.6410    | 0.7500    |
| 38                                             | 0.5145    | 0.5760     | 0.6225    | 0.6550    | 0.7805    |
| 39                                             | 0.5145    | 0.5760     | 0.6225    | 0.6550    | 0.7805    |
| 40                                             | 0.5145    | 0.5760     | 0.6225    | 0.6550    | 0.7805    |
| 41                                             | 0.5395    | 0.6025     | 0.6475    | 0.6975    | 0.8230    |
| 42                                             | 0.5395    | 0.6025     | 0.6475    | 0.6975    | 0.8230    |
| 43                                             | 0.5395    | 0.6025     | 0.6475    | 0.6975    | 0.8230    |
| 44                                             | 0.5635    | 0.6265     | 0.6735    | 0.7250    | 0.8540    |
| 45                                             | 0.5635    | 0.6265     | 0.6760    | 0.7250    | 0.8540    |
| 46                                             | 0.5635    | 0.6265     | 0.6760    | 0.7250    | 0.8540    |
| 47                                             | 0.5635    | 0.6265     | 0.6760    | 0.7250    | 0.8540    |
| 48                                             | 0.5635    | 0.6265     | 0.6760    | 0.7375    | 0.8665    |

# Steel Factors for Instrumentation Cables - FeF

## Fe PIS

### Pair Instrumentation Individual and Over all Screen Cables

| No. of Pairs<br>Cable size in<br>sq.mm | 0.5 sq.mm | 0.75 sq.mm | 1.0 sq.mm | 1.5 sq.mm | 2.5 sq.mm |
|----------------------------------------|-----------|------------|-----------|-----------|-----------|
| 1                                      | 0.1880    | 0.1980     | 0.2070    | 0.2220    | 0.2410    |
| 2                                      | 0.2315    | 0.2460     | 0.2595    | 0.2815    | 0.2755    |
| 3                                      | 0.2505    | 0.2690     | 0.2820    | 0.2495    | 0.2830    |
| 4                                      | 0.2645    | 0.2830     | 0.2420    | 0.2805    | 0.3155    |
| 5                                      | 0.2895    | 0.2730     | 0.2805    | 0.3005    | 0.3430    |
| 6                                      | 0.2755    | 0.2980     | 0.3005    | 0.3280    | 0.3730    |
| 7                                      | 0.2755    | 0.2980     | 0.3005    | 0.3280    | 0.3730    |
| 8                                      | 0.2980    | 0.3215     | 0.3455    | 0.3740    | 0.4230    |
| 9                                      | 0.3230    | 0.3490     | 0.3730    | 0.4040    | 0.4685    |
| 10                                     | 0.3405    | 0.3655     | 0.3765    | 0.4215    | 0.4885    |
| 11                                     | 0.3430    | 0.3690     | 0.3815    | 0.4265    | 0.4845    |
| 12                                     | 0.3490    | 0.3765     | 0.4015    | 0.4470    | 0.5160    |
| 13                                     | 0.3715    | 0.3990     | 0.4255    | 0.4720    | 0.5420    |
| 14                                     | 0.3715    | 0.3990     | 0.4255    | 0.4720    | 0.5420    |
| 15                                     | 0.3955    | 0.4240     | 0.4510    | 0.5020    | 0.5720    |
| 16                                     | 0.3955    | 0.4240     | 0.4510    | 0.5020    | 0.5720    |
| 17                                     | 0.4190    | 0.4495     | 0.4795    | 0.5295    | 0.6150    |
| 18                                     | 0.4190    | 0.4495     | 0.4795    | 0.5295    | 0.6150    |
| 19                                     | 0.4190    | 0.4495     | 0.4795    | 0.5295    | 0.6150    |
| 20                                     | 0.4445    | 0.4770     | 0.5060    | 0.5570    | 0.6450    |
| 21                                     | 0.4445    | 0.4895     | 0.5060    | 0.5695    | 0.6450    |
| 22                                     | 0.4695    | 0.5045     | 0.5345    | 0.5870    | 0.6885    |
| 23                                     | 0.4695    | 0.5045     | 0.5345    | 0.5870    | 0.6885    |
| 24                                     | 0.4970    | 0.5310     | 0.5620    | 0.6285    | 0.7210    |
| 25                                     | 0.4970    | 0.5310     | 0.5620    | 0.6285    | 0.7210    |
| 26                                     | 0.4970    | 0.5310     | 0.5620    | 0.6285    | 0.7210    |
| 27                                     | 0.5035    | 0.5495     | 0.5810    | 0.6360    | 0.7410    |
| 28                                     | 0.5135    | 0.5610     | 0.6050    | 0.6610    | 0.7690    |
| 29                                     | 0.5135    | 0.5610     | 0.6050    | 0.6610    | 0.7690    |
| 30                                     | 0.5260    | 0.5610     | 0.6050    | 0.6610    | 0.7690    |
| 31                                     | 0.5495    | 0.5845     | 0.6300    | 0.6885    | 0.7990    |
| 32                                     | 0.5495    | 0.5845     | 0.6300    | 0.6885    | 0.7990    |
| 33                                     | 0.5495    | 0.5845     | 0.6300    | 0.6885    | 0.7990    |
| 34                                     | 0.5735    | 0.6225     | 0.6585    | 0.7285    | 0.8405    |
| 35                                     | 0.5735    | 0.6225     | 0.6585    | 0.7285    | 0.8405    |
| 36                                     | 0.5735    | 0.6225     | 0.6585    | 0.7285    | 0.8405    |
| 37                                     | 0.5735    | 0.6225     | 0.6585    | 0.7285    | 0.8405    |
| 38                                     | 0.5990    | 0.6485     | 0.6850    | 0.7575    | 0.8740    |
| 39                                     | 0.5990    | 0.6485     | 0.6850    | 0.7575    | 0.8740    |
| 40                                     | 0.5990    | 0.6485     | 0.6850    | 0.7575    | 0.8740    |
| 41                                     | 0.6250    | 0.6775     | 0.7135    | 0.7880    | 0.9180    |
| 42                                     | 0.6250    | 0.6775     | 0.7135    | 0.7880    | 0.9180    |
| 43                                     | 0.6250    | 0.6775     | 0.7135    | 0.7880    | 0.9180    |
| 44                                     | 0.6485    | 0.7050     | 0.7410    | 0.8165    | 0.9495    |
| 45                                     | 0.6485    | 0.7050     | 0.7410    | 0.8165    | 0.9495    |
| 46                                     | 0.6485    | 0.7050     | 0.7410    | 0.8165    | 0.9495    |
| 47                                     | 0.6485    | 0.7050     | 0.7410    | 0.8165    | 0.9495    |
| 48                                     | 0.6485    | 0.7050     | 0.7535    | 0.8290    | 0.9620    |



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Cir. No. 35/DIV/ CAB/05/

24<sup>th</sup> April 2018

To Members of the Cable Division, Utilities, Railways & Listed purchasing organizations

**Sub: Correction in PV formulae of LT XLPE Power Cable and addition of factors for HT XLPE Power Cables**

We have recently published revised Price Variation Clause for LT&HT XLPE Power Cables and made it effective from 1<sup>st</sup> November 2017 vide Cir. No.111/DIV/CAB/05 dated 5<sup>th</sup> December 2017

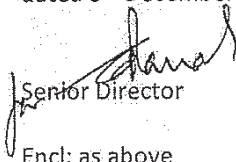
While replying to a query of a buyer it is observed that the polymer factor for LT XLPE Power Cables (both aluminium and copper) was incorrectly represented by Table P2.

We have now corrected the anomaly by correcting the PV formulae of LT XLPE Aluminium and Copper Insulated Cables (Sl. No. D & E) by representing Polymer factor by Table L2.

We have also worked out factors for XLPE, Copper and Steel for 3 core HT XLPE Power Cables for 500 and 630 sq.mm.

We now enclose complete PV clause of Cable by including all the PV formulae of different types of power cable (Sl. No. A to I), polymer factor Table L2 and updated XL4, H2 and H5 Table of factors for your perusal & record.

We request to replace PV clause of Cable already circulated vide Cir. 111/DIV/CAB/05 dated 5<sup>th</sup> December 2017 with the enclosed PV clause in your records for future use.

  
Senior Director  
Encl: as above

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**IEEMA (PVC)/CABLE(R-1)/2017****Effective from: 1<sup>st</sup> November 217****Material Price Variation Clause For PVC And XLPE Insulated Cables**

The Price quoted/confirmed is based on the input cost of raw materials/components as on the date of quotation, and the same is deemed to be related to the prices of raw materials as specified in the price variation clause given below. In case of any variation in these prices, the price payable shall be subject to adjustment up or down in accordance with the formulae provided in this document.

Terms used in price variation formulae:

P Price payable as adjusted in accordance with above appropriate formula (in Rs/Km)

Po Price quoted/confirmed (in Rs/Km)

**ALUMINIUM**

AIF Variation factor for aluminium

AI Price of Aluminium. This price is as applicable of first working day of the month, one month prior to the date of delivery.

Alo Price of aluminium. This price is as applicable on first working day of the month, one month prior to the date of tendering.

**COPPER**

CuF Variation factor for copper

Cu Price of CC copper rods. This price is as applicable on first working day of the month, one month prior to the date of delivery.

Cuo Price of CC copper rods. This price is as applicable on first working day of the month, one month prior to the date of tendering.

**PVC COMPOUND**

PVCc price of PVC compound. This price is as applicable on first working day of the month, one month prior to the date of delivery.

PVCco Price of PVC compound. This price is as applicable on first working day of the month, one month prior to the date of tendering.

CCFAI Variation factor for PVC compound/Polymer for aluminum conductor cable.

CCFCu Variation factor for PVC compound/Polymer for copper conductor cable.

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**IEEMA (PVC)/CABLE(R-1)/2017**  
**XLPE COMPOUND**

**Effective from: 1<sup>st</sup> November 217**

**Cc** price of XLPE compound. This price is as applicable on first working day of the month, one month prior to the date of delivery.

**Cco** Price of XLPE compound. This price is as applicable on first working day of the month, one month prior to the date of tendering.

**XLFAL** Variation factor for XLPE compound for aluminum conductor cable.

**XLFCU** Variation factor for XLPE compound for Copper conductor cable.

**STEEL**

**FeF** Variation factor for steel

**FeW** Variation factor for round wire steel armouring

**Fe** Price of Steel Strips/steel wire. This price is as applicable on the first working day of the month, one month prior to the date of delivery.

**Feo** Price of steel strips/steel wire. This price is as applicable on first working day of the month, one month prior to the date of tendering.

The above prices and indices are as published by IEEMA vide Circular reference IEEMA (PVC)/CABLE R(1)/--/-- prevailing as on 1<sup>st</sup> working day of the month i.e. one month prior to the date of tendering.

The date of delivery is the date on which the cable is notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

**Notes**

- All prices of raw materials are exclusive of GST amount.
- All prices excluding Aluminium & Copper are as on first working day of the month.
- The details of prices are as under:

- Price of Aluminium is LME average Cash SELLER Settlement price of Primary Aluminium in US\$ per MT as published by London Metal Bulletin (LME) including Premium for Aluminium Ingot in US\$ per MT is converted in Indian Rs./MT.
- Price of PVC Compound (in Rs/MT) is the ex-works price, as quoted by the manufacturer.
- Price of XLPE Compound (in Rs/MT) is the ex-works price, as quoted by the manufacturer.
- Price of CC copper rods (in Rs/MT) is ex-works price as quoted by the primary producer.
- Price of galvanized steel strip / steel wire (in Rs/MT) is ex-works price as quoted by the manufacturer for Round steel Wire and Flat steel strip (the relevant price of steel strip or steel wire is to be selected depending upon the type of armouring of the cable).

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**IEEMA (PVC)/CABLE(R-1)/2017**Effective from: 1<sup>st</sup> November 2017**Price variation formulae for 'Power Cables'****A. Aluminum conductor PVC insulated 1.1 kV power cables**

$$P = P_o + AIF (AL - ALo) + CCFAI (PVCc - PVCco) + FeF (Fe - Feo)$$

For unarmoured multicore cables (without steel armour);  $FeF = 0$ Table References:

|     |                                                                     |
|-----|---------------------------------------------------------------------|
| ALP | Aluminium conductor in single core unarmoured & multicore cables    |
| P1  | Aluminium conductor aluminium armour in single core armoured cables |
| P2  | PVC compound                                                        |
| P3  | Steel armour                                                        |

**B. Copper conductor PVC insulated 1.1 kV power cables**

$$P = P_o + CuF (Cu - Cuo) + CCFCu (PVCc - PVCco) + FeF (Fe - Feo) + AIF (Al - ALo)$$

For steel armoured cables;  $AIF = 0$  For aluminium armoured cables;  $FeF = 0$ For unarmoured cables;  $FeF, AIF = 0$ Tables References:

|     |                  |
|-----|------------------|
| CUP | Copper conductor |
| P2  | PVC compound     |
| P3  | Steel armour     |
| P4  | Aluminium armour |

**C. Copper conductor PVC insulated 1.1 kV control cables**

$$P = P_o + CuF (Cu - Cuo) + CCFCu (PVCc - PVCco) + FeF (Fe - Feo)$$

For unarmoured cables;  $FeF = 0$ Tables References:

|     |                  |
|-----|------------------|
| CUC | Copper conductor |
| P5  | PVC compound     |
| P6  | Steel armour     |

**D. Aluminum conductor XLPE insulated 1.1 kV power cables**

$$P = P_o + AIF (AL - ALo) + XLFAL (CC - Cco) + CCFAI (PVCc - PVCco) + FeF (Fe - Feo)$$

For unarmoured multicore cables (without steel armour);  $FeF = 0$ Table References:

|     |                                                                     |
|-----|---------------------------------------------------------------------|
| ALP | Aluminium conductor in single core unarmoured & multicore cables    |
| P1  | Aluminium conductor aluminium armour in single core armoured cables |
| L2  | Polymer (CCFAI)                                                     |
| P3  | Steel armour                                                        |
| XL1 | XLPE Compound (XLFAL)                                               |

**E. Copper conductor XLPE insulated 1.1 kV power cables**

$$P = P_o + CuF (Cu - Cuo) + XLFCU (CC - Cco) + CCFCu (PVCc - PVCco) + FeF (Fe - Feo) + AIF (Al - ALo)$$

For steel armoured cables;  $AIF = 0$  For aluminium armoured cables;  $FeF = 0$ **HEAD OFFICE - DELHI**

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For unarmoured cables; FeF, AIF = 0

Tables References:

|     |                       |
|-----|-----------------------|
| CUP | Copper conductor      |
| L2  | Polymer (CCFCu)       |
| P3  | Steel armour          |
| P4  | Aluminium armour      |
| XL1 | XLPE Compound (XLFCu) |

**F. Copper conductor XLPE insulated 1.1 kV control cables**

$$P = P_o + CuF (Cu - Cu_o) + XLFCU (CC-Cco) + CCFCu (PVCc-PVCco) + FeF (Fe - Fe_o)$$

For unarmoured cables; FeF = 0

Tables References:

|     |                  |
|-----|------------------|
| CUC | Copper conductor |
| P5  | PVC compound     |
| P6  | Steel armour     |
| XL2 | XLPE Compound    |

**G. For Aluminium conductor XLPE insulated 3.3 to 33 kV power cables**

$$P = P_o + AIF (Al - Al_o) + XLFAL (CC-Cco) + CCFAI (PVCc - PVCco) + FeF (Fe - Fe_o)$$

For unarmoured multicore cables (without steel armour); FeF = 0

Table References:

|         |                                                                       |
|---------|-----------------------------------------------------------------------|
| ALP     | Aluminium conductor in single core unarmoured & multicore cables      |
| H1      | Aluminium conductor + aluminium armour in single core armoured cables |
| H2      | Polymer                                                               |
| H3/H5   | Steel armour (Flat/Round)                                             |
| XL3/XL4 | XLPE Compound (Single core /Multicore)                                |

**H. Copper conductor XLPE Insulated 3.3 to 33 kV power cables**

$$P = P_o + CuF (Cu - Cu_o) + XLFCU (CC-Cco) + CCFCu (PVCc - PVCco) + FeF (Fe - Fe_o) + AIF (Al - Al_o)$$

For steel armoured cables; AIF = 0 For aluminium armoured cables; FeF = 0

For unarmoured cables; FeF, AIF = 0

Table References:

|         |                                        |
|---------|----------------------------------------|
| CUP     | Copper conductor                       |
| H2      | Polymer                                |
| H3/H5   | Steel armour (Flat/Round)              |
| H4      | Aluminium armour                       |
| XL3/XL4 | XLPE Compound (Single core /Multicore) |

**I. Copper conductor XLPE insulated 1.0 and 1.5 kV Solar PV DC cables**

$$P = P_o + CuF (Cu - Cu_o)$$

Table CUdc Copper Conductor

*[Signature]*  
 Authorized Signatory

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TABLE ALP

VARIATION FACTOR FOR ALUMINIUM (AIF)  
POWER CABLES WITH ALUMINIUM CONDUCTOR  
(EXCLUDING SINGLE CORE ARMOURED CABLES)

| Nominal Cross Sectional Area (in Sq. mm.) | 1 core | 2 core | 3 core | 3.5 core | 4 core |
|-------------------------------------------|--------|--------|--------|----------|--------|
| 2.5                                       | 0.007  | 0.014  | 0.021  | -        | 0.028  |
| 4                                         | 0.011  | 0.023  | 0.034  | -        | 0.046  |
| 6                                         | 0.017  | 0.034  | 0.052  | -        | 0.069  |
| 10                                        | 0.029  | 0.053  | 0.087  | -        | 0.116  |
| 16                                        | 0.046  | 0.091  | 0.137  | -        | 0.183  |
| 25/16                                     | 0.073  | 0.146  | 0.219  | 0.262    | 0.292  |
| 35/16                                     | 0.101  | 0.202  | 0.302  | 0.345    | 0.404  |
| 50/25                                     | 0.137  | 0.273  | 0.410  | 0.478    | 0.547  |
| 70/35                                     | 0.197  | 0.395  | 0.593  | 0.687    | 0.791  |
| 95/50                                     | 0.274  | 0.548  | 0.821  | 0.949    | 1.095  |
| 120/70                                    | 0.346  | 0.691  | 1.035  | 1.221    | 1.382  |
| 150/70                                    | 0.425  | 0.853  | 1.279  | 1.464    | 1.706  |
| 185/95                                    | 0.533  | 1.070  | 1.605  | 1.861    | 2.140  |
| 225/120                                   | 0.655  | 1.310  | 1.965  | 2.287    | 2.620  |
| 240/120                                   | 0.703  | 1.400  | 2.099  | 2.421    | 2.799  |
| 300/150                                   | 0.879  | 1.757  | 2.635  | 3.033    | 3.514  |
| 400/185                                   | 1.126  | 2.249  | 3.374  | 3.873    | 4.498  |
| 500                                       | 1.418  | 2.838  | 4.256  | -        | 5.675  |
| 630                                       | 1.828  | 3.663  | 5.494  | -        | 7.326  |
| 800                                       | 2.340  | 4.679  | 7.018  | -        | 9.357  |
| 1000                                      | 2.951  | 5.890  | 8.834  | -        | 11.779 |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

TABLE CUP

**VARIATION FACTOR FOR COPPER CONDUCTOR (CUF)**  
**POWER CABLES WITH COPPER CONDUCTOR**

| Nominal Cross Sectional Area (in Sq. mm.) | 1 core | 2 core | 3 core | 3.5 core | 4 core |
|-------------------------------------------|--------|--------|--------|----------|--------|
| 2.5                                       | 0.023  | 0.046  | 0.069  | -        | 0.092  |
| 4                                         | 0.036  | 0.076  | 0.112  | -        | 0.151  |
| 6                                         | 0.056  | 0.112  | 0.171  | -        | 0.227  |
| 10                                        | 0.095  | 0.174  | 0.286  | -        | 0.382  |
| 16                                        | 0.151  | 0.299  | 0.451  | -        | 0.602  |
| 25/16                                     | 0.240  | 0.480  | 0.720  | 0.862    | 0.960  |
| 35/16                                     | 0.332  | 0.664  | 0.993  | 1.135    | 1.329  |
| 50/25                                     | 0.451  | 0.898  | 1.348  | 1.572    | 1.799  |
| 70/35                                     | 0.648  | 1.299  | 1.950  | 2.260    | 2.602  |
| 95/50                                     | 0.901  | 1.802  | 2.700  | 3.121    | 3.601  |
| 120/70                                    | 1.138  | 2.273  | 3.407  | 4.016    | 4.545  |
| 150/70                                    | 1.398  | 2.806  | 4.207  | 4.815    | 5.611  |
| 185/95                                    | 1.753  | 3.519  | 5.279  | 6.121    | 7.038  |
| 225/120                                   | 2.154  | 4.309  | 6.463  | 7.522    | 8.617  |
| 240/120                                   | 2.312  | 4.605  | 6.904  | 7.963    | 9.206  |
| 300/150                                   | 2.891  | 5.779  | 8.667  | 9.976    | 11.558 |
| 400/185                                   | 3.703  | 7.397  | 11.097 | 12.738   | 14.794 |
| 500                                       | 4.664  | 9.334  | 13.998 | -        | 18.665 |
| 630                                       | 6.012  | 12.048 | 18.070 | -        | 24.095 |
| 800                                       | 7.696  | 15.389 | 23.082 | -        | 30.775 |
| 1000                                      | 9.706  | 19.372 | 29.055 | -        | 38.741 |

TABLE CU<sub>sd</sub>c

**VARIATION FACTOR FOR COPPER CONDUCTOR (CUF)**  
**1.0 & 1.5KV Solar PV DC Cables with Copper Conductor**

| Cable Size in sq.mm. | Copper content in MT/km |
|----------------------|-------------------------|
| 2.5                  | 0.023                   |
| 4                    | 0.038                   |
| 6                    | 0.058                   |
| 10                   | 0.090                   |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

TABLE CUC

VARIATION FACTOR FOR COPPER CONDUCTOR (CUF)  
CONTROL CABLES WITH COPPER CONDUCTOR

| No of Cores | Core size 1.5 sq mm | Core size 2.5 sq mm |
|-------------|---------------------|---------------------|
| 2           | 0.026               | 0.047               |
| 3           | 0.039               | 0.070               |
| 4           | 0.052               | 0.094               |
| 5           | 0.065               | 0.117               |
| 6           | 0.078               | 0.141               |
| 7           | 0.091               | 0.164               |
| 8           | 0.110               | 0.182               |
| 9           | 0.117               | 0.205               |
| 10          | 0.130               | 0.235               |
| 12          | 0.157               | 0.282               |
| 14          | 0.183               | 0.329               |
| 16          | 0.209               | 0.376               |
| 18          | 0.246               | 0.410               |
| 19          | 0.248               | 0.446               |
| 20          | 0.260               | 0.456               |
| 24          | 0.313               | 0.563               |
| 27          | 0.352               | 0.634               |
| 30          | 0.391               | 0.704               |
| 37          | 0.483               | 0.869               |
| 44          | 0.573               | 1.033               |
| 52          | 0.678               | 1.221               |
| 61          | 0.796               | 1.432               |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

TABLE P1

**VARIATION FACTOR FOR ALUMINIUM (AIF)**  
**ALUMINIUM ARMoured SINGLE CORE PVC INSULATED 1.1 KV CABLES**

| Nominal cross sectional area<br>(in Sq.mm) | Aluminium factor for Aluminium armoured cable<br>with aluminium conductor |
|--------------------------------------------|---------------------------------------------------------------------------|
| 4                                          | 0.0685                                                                    |
| 6                                          | 0.0795                                                                    |
| 10                                         | 0.1017                                                                    |
| 16                                         | 0.1303                                                                    |
| 25                                         | 0.1693                                                                    |
| 35                                         | 0.2090                                                                    |
| 50                                         | 0.2597                                                                    |
| 70                                         | 0.3360                                                                    |
| 95                                         | 0.4567                                                                    |
| 120                                        | 0.5443                                                                    |
| 150                                        | 0.6427                                                                    |
| 185                                        | 0.7743                                                                    |
| 240                                        | 0.9737                                                                    |
| 300                                        | 1.2582                                                                    |
| 400                                        | 1.5502                                                                    |
| 500                                        | 1.8958                                                                    |
| 630                                        | 2.3650                                                                    |
| 800                                        | 2.9306                                                                    |
| 1000                                       | 3.7666                                                                    |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

TABLE P2

VARIATION FACTOR FOR PVC COMPOUND ( CCFAI/CCFCu)  
PVC INSULATED 1.1 KV POWER CABLES WITH COPPER/ALUMINIUM CONDUCTOR

| Nominal cross<br>Sectional Area<br>(in Sq. mm) | 1 core | 2 core |       | 3 core |       | 3.5 core |       | 4 core |       |
|------------------------------------------------|--------|--------|-------|--------|-------|----------|-------|--------|-------|
|                                                | Unarm  | Unarm  | arm   | Unarm  | arm   | Unarm    | arm   | Unarm  | arm   |
| 2.5                                            | 0.079  | 0.125  | 0.139 | 0.141  | 0.157 | -        | -     | 0.161  | 0.179 |
| 4                                              | 0.094  | 0.140  | 0.156 | 0.164  | 0.182 | -        | -     | 0.188  | 0.209 |
| 6                                              | 0.101  | 0.154  | 0.171 | 0.179  | 0.199 | -        | -     | 0.198  | 0.220 |
| 10                                             | 0.114  | 0.194  | 0.216 | 0.214  | 0.238 | -        | -     | 0.249  | 0.277 |
| 16                                             | 0.142  | 0.234  | 0.246 | 0.279  | 0.290 | -        | -     | 0.328  | 0.345 |
| 25                                             | 0.171  | 0.288  | 0.303 | 0.364  | 0.383 | 0.422    | 0.444 | 0.443  | 0.466 |
| 35                                             | 0.189  | 0.321  | 0.338 | 0.403  | 0.429 | 0.489    | 0.515 | 0.498  | 0.524 |
| 50                                             | 0.211  | 0.411  | 0.433 | 0.508  | 0.535 | 0.613    | 0.645 | 0.647  | 0.681 |
| 70                                             | 0.241  | -      | -     | 0.613  | 0.645 | 0.707    | 0.744 | -      | -     |
| 95                                             | 0.284  | -      | -     | 0.795  | 0.811 | 0.908    | 0.927 | -      | -     |
| 120                                            | 0.339  | -      | -     | 0.866  | 0.884 | 1.024    | 1.045 | -      | -     |
| 150                                            | 0.388  | -      | -     | 1.070  | 1.092 | 1.289    | 1.315 | -      | -     |
| 185                                            | 0.450  | -      | -     | 1.310  | 1.337 | 1.499    | 1.530 | -      | -     |
| 225                                            | 0.521  | -      | -     | 1.586  | 1.618 | 1.840    | 1.878 | -      | -     |
| 240                                            | 0.534  | -      | -     | 1.649  | 1.683 | 1.990    | 2.031 | -      | -     |
| 300                                            | 0.653  | -      | -     | 2.007  | 2.048 | 2.361    | 2.409 | -      | -     |
| 400                                            | 0.770  | -      | -     | 2.437  | 2.487 | 2.616    | 2.669 | -      | -     |
| 500                                            | 0.936  | -      | -     | 3.117  | 3.181 | 3.687    | 3.762 | -      | -     |
| 630                                            | 1.175  | -      | -     | -      | -     | -        | -     | -      | -     |
| 800                                            | 1.433  | -      | -     | -      | -     | -        | -     | -      | -     |
| 1000                                           | 1.642  | -      | -     | -      | -     | -        | -     | -      | -     |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

TABLE P3

**VARIATION FACTOR FOR STEEL (FeF)**  
**PVC INSULATED 1.1 KV POWER CABLES WITH COPPER/ALUMINIUM CONDUCTOR**

| Nominal Cross sectional Area (in Sq. mm) | 2 core | Shape | 3 core | Shape | 3 ½ core | Shape | 4 core | Shape |
|------------------------------------------|--------|-------|--------|-------|----------|-------|--------|-------|
| 4                                        | 0.305  | W     | 0.335  | W     | -        | -     | 0.363  | W     |
| 6                                        | 0.348  | W     | 0.363  | W     | -        | -     | 0.407  | W     |
| 10                                       | 0.392  | W     | 0.407  | W     | -        | -     | 0.293  | F     |
| 16                                       | 0.235  | F     | 0.293  | F     | -        | -     | 0.323  | F     |
| 25                                       | 0.293  | F     | 0.352  | F     | 0.382    | F     | 0.382  | F     |
| 35                                       | 0.323  | F     | 0.382  | F     | 0.411    | F     | 0.440  | F     |
| 50                                       | 0.382  | F     | 0.440  | F     | 0.469    | F     | 0.499  | F     |
| 70                                       | 0.411  | F     | 0.499  | F     | -        | F     | 0.587  | F     |
| 95                                       | 0.499  | F     | 0.587  | F     | 0.616    | F     | 0.645  | F     |
| 120                                      | 0.528  | F     | 0.616  | F     | 0.675    | F     | 0.731  | F     |
| 150                                      | 0.587  | F     | 0.675  | F     | 0.731    | F     | 0.790  | F     |
| 185                                      | 0.645  | F     | 0.761  | F     | 0.820    | F     | 0.879  | F     |
| 240                                      | 0.731  | F     | 0.879  | F     | 0.937    | F     | 0.996  | F     |
| 300                                      | 0.820  | F     | 0.966  | F     | 1.055    | F     | 1.113  | F     |
| 400                                      | 0.937  | F     | 1.083  | F     | 1.172    | F     | 1.231  | F     |
| 500                                      | 1.055  | F     | 1.231  | F     | 1.348    | F     | 1.406  | F     |
| 630                                      | 1.172  | F     | -      | -     | -        | -     | -      | -     |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

TABLE P3 (Additional)

VARIATION FACTOR FOR ROUND WIRE 'W' STEEL (FeF)  
PVC INSULATED 1.1 KV POWER CABLES WITH COPPER/ALUMINIUM CONDUCTOR

| Nominal Cross<br>Sectional Area<br>(in sq. mm) | 2 Core | 3 Core | 3.5 Core | 4 Core |
|------------------------------------------------|--------|--------|----------|--------|
| 1.5                                            | 0.247  | 0.259  |          | 0.288  |
| 2.5                                            | 0.273  | 0.289  |          | 0.329  |
| 4                                              | 0.305  | 0.335  |          | 0.363  |
| 6                                              | 0.348  | 0.363  |          | 0.407  |
| 10                                             | 0.392  | 0.407  |          | 0.533  |
| 16                                             | 0.439  | 0.523  | 0.014    | 0.573  |
| 25                                             | 0.526  | 0.625  | 0.664    | 0.685  |
| 35                                             | 0.591  | 0.685  | 0.729    | 0.761  |
| 50                                             | 0.661  | 0.790  | 0.864    | 1.108  |
| 70                                             | 0.745  | 1.122  | 1.200    | 1.256  |
| 95                                             | 1.085  | 1.286  | 1.376    | 1.443  |
| 120                                            | 1.147  | 1.386  | 1.479    | 1.562  |
| 150                                            | 1.267  | 1.526  | 1.684    | 2.173  |
| 185                                            | 1.403  | 2.090  | 2.315    | 2.421  |
| 240                                            | 1.994  | 2.397  | 2.641    | 2.722  |
| 300                                            | 2.180  | 2.642  | 3.670    | 3.842  |
| 400                                            | 2.987  | 3.728  | 4.126    | 4.292  |
| 500                                            | 3.517  | 4.226  | 5.958    | 6.301  |
| 630                                            | 4.774  | 6.018  | 6.737    | 7.141  |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

TABLE P4

**VARIATION FACTOR FOR ALUMINIUM (AIF)**  
**PVC INSULATED 1.1 KV POWER CABLES WITH COPPER CONDUCTOR**

| Nominal Cross Sectional Area<br>(in Sq. mm) | Aluminium Factor for Aluminium armoured cable with copper conductor |
|---------------------------------------------|---------------------------------------------------------------------|
| 4                                           | 0.058                                                               |
| 6                                           | 0.063                                                               |
| 10                                          | 0.073                                                               |
| 16                                          | 0.084                                                               |
| 25                                          | 0.096                                                               |
| 35                                          | 0.108                                                               |
| 50                                          | 0.123                                                               |
| 70                                          | 0.139                                                               |
| 95                                          | 0.183                                                               |
| 120                                         | 0.198                                                               |
| 150                                         | 0.218                                                               |
| 185                                         | 0.241                                                               |
| 240                                         | 0.271                                                               |
| 300                                         | 0.379                                                               |
| 400                                         | 0.424                                                               |
| 500                                         | 0.478                                                               |
| 630                                         | 0.537                                                               |
| 800                                         | 0.591                                                               |
| 1000                                        | 0.816                                                               |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

TABLE P5

VARIATION FACTOR FOR PVC COMPOUND (CCFCu)  
PVC INSULATED CONTROL CABLES WITH COPPER CONDUCTOR

| No of cores | Core size 1.5 sq mm |       | Core size 2.5 sq mm |       |
|-------------|---------------------|-------|---------------------|-------|
|             | Unarm               | Arm   | Unarm               | Arm   |
| 2           | 0.118               | 0.121 | 0.125               | 0.139 |
| 3           | 0.121               | 0.131 | 0.141               | 0.157 |
| 4           | 0.137               | 0.152 | 0.161               | 0.179 |
| 5           | 0.157               | 0.174 | 0.187               | 0.206 |
| 6           | 0.179               | 0.199 | 0.234               | 0.260 |
| 7           | 0.179               | 0.199 | 0.234               | 0.260 |
| 8           | 0.193               | 0.215 | 0.292               | 0.325 |
| 9           | 0.216               | 0.241 | 0.300               | 0.335 |
| 10          | 0.236               | 0.262 | 0.303               | 0.337 |
| 12          | 0.249               | 0.277 | 0.334               | 0.371 |
| 14          | 0.311               | 0.327 | 0.389               | 0.409 |
| 16          | 0.344               | 0.362 | 0.435               | 0.458 |
| 18          | 0.352               | 0.371 | 0.474               | 0.500 |
| 19          | 0.375               | 0.395 | 0.476               | 0.501 |
| 20          | 0.391               | 0.412 | 0.519               | 0.546 |
| 24          | 0.457               | 0.481 | 0.584               | 0.615 |
| 27          | 0.491               | 0.517 | 0.631               | 0.664 |
| 30          | 0.529               | 0.557 | 0.706               | 0.743 |
| 37          | 0.615               | 0.647 | 0.835               | 0.879 |
| 44          | 0.739               | 0.778 | 1.019               | 1.026 |
| 52          | 0.845               | 0.889 | 1.100               | 1.158 |
| 61          | 0.952               | 1.002 | 1.246               | 1.312 |

IEEMA (PVC)/CABLE(R-1)/2017  
TABLE P6

Effective from: 1<sup>st</sup> November 2017

VARIATION FACTOR FOR STEEL (FeF)  
PVC INSULATED CONTROL CABLES WITH COPPER CONDUCTOR

| No of cores | Core size<br>1.5 sq mm | Shape of<br>armour | Core size<br>2.5 sq mm | Shape of<br>armour |
|-------------|------------------------|--------------------|------------------------|--------------------|
| 2           | 0.243                  | W                  | 0.277                  | W                  |
| 3           | 0.257                  | W                  | 0.289                  | W                  |
| 4           | 0.277                  | W                  | 0.314                  | W                  |
| 5           | 0.303                  | W                  | 0.342                  | W                  |
| 6           | 0.329                  | W                  | 0.379                  | W                  |
| 7           | 0.329                  | W                  | 0.379                  | W                  |
| 8           | 0.341                  | W                  | 0.456                  | W                  |
| 9           | 0.383                  | W                  | 0.275                  | F                  |
| 10          | 0.408                  | W                  | 0.325                  | F                  |
| 12          | 0.289                  | F                  | 0.342                  | F                  |
| 14          | 0.306                  | F                  | 0.360                  | F                  |
| 16          | 0.317                  | F                  | 0.372                  | F                  |
| 18          | 0.332                  | F                  | 0.350                  | F                  |
| 19          | 0.343                  | F                  | 0.397                  | F                  |
| 20          | 0.368                  | F                  | 0.400                  | F                  |
| 24          | 0.398                  | F                  | 0.475                  | F                  |
| 27          | 0.414                  | F                  | 0.478                  | F                  |
| 30          | 0.425                  | F                  | 0.503                  | F                  |
| 37          | 0.461                  | F                  | 0.548                  | F                  |
| 44          | 0.507                  | F                  | 0.601                  | F                  |
| 52          | 0.556                  | F                  | 0.641                  | F                  |
| 61          | 0.585                  | F                  | 0.685                  | F                  |

IEEMA (PVC)/CABLE(R-1)/2017  
TABLE P6 (Additional)

Effective from: 1<sup>st</sup> November 217

VARIATION FACTOR FOR ROUND WIRE 'W' STEEL (FeF)  
PVC INSULATED CONTROL CABLES WITH COPPER CONDUCTOR

| No. of Cores | Core size 1.5 sq mm | Core size 2.5 sq mm |
|--------------|---------------------|---------------------|
| 2            | 0.243               | 0.273               |
| 3            | 0.257               | 0.289               |
| 4            | 0.277               | 0.314               |
| 5            | 0.303               | 0.342               |
| 6            | 0.329               | 0.379               |
| 7            | 0.329               | 0.379               |
| 8            | 0.341               | 0.456               |
| 9            | 0.383               | 0.508               |
| 10           | 0.408               | 0.535               |
| 12           | 0.510               | 0.572               |
| 14           | 0.546               | 0.625               |
| 16           | 0.581               | 0.660               |
| 19           | 0.608               | 0.696               |
| 24           | 0.714               | 0.819               |
| 25           | 0.679               | 0.798               |
| 27           | 0.732               | 0.837               |
| 28           | 0.696               | 0.815               |
| 30           | 0.758               | 0.881               |
| 33           | 0.747               | 0.883               |
| 37           | 0.820               | 1.217               |
| 44           | 0.926               | 1.355               |
| 48           | 1.122               | 1.308               |
| 50           | 1.122               | 1.308               |
| 52           | 1.149               | 1.361               |
| 56           | 1.202               | 1.388               |
| 61           | 1.299               | 1.520               |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

TABLE L2

VARIATION FACTOR FOR POLYMER (CCFAI / CCFCu)  
XLPE INSULATED 1.1 KV POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR

| Nominal<br>Cross<br>Sectional<br>Area (in<br>Sq. mm) | 1 core | 2 core |       | 3 core |       | 3.5 core |       | 4 core |       |
|------------------------------------------------------|--------|--------|-------|--------|-------|----------|-------|--------|-------|
|                                                      | Unarm  | Unarm  | Arm   | Unarm  | Arm   | Unarm    | Arm   | Unarm  | Arm   |
| 2.5                                                  | 0.055  | 0.163  | 0.175 | 0.166  | 0.177 | -        | -     | 0.177  | 0.188 |
| 4                                                    | 0.075  | 0.201  | 0.204 | 0.205  | 0.213 | -        | -     | 0.218  | 0.213 |
| 6                                                    | 0.085  | 0.213  | 0.234 | 0.205  | 0.230 | -        | -     | 0.242  | 0.232 |
| 10                                                   | 0.082  | 0.252  | 0.280 | 0.217  | 0.251 | -        | -     | 0.285  | 0.298 |
| 16                                                   | 0.089  | 0.278  | 0.341 | 0.289  | 0.246 | -        | -     | 0.300  | 0.279 |
| 25                                                   | 0.101  | 0.307  | 0.278 | 0.276  | 0.247 | 0.295    | 0.264 | 0.331  | 0.290 |
| 35                                                   | 0.109  | 0.330  | 0.319 | 0.305  | 0.270 | 0.328    | 0.292 | 0.368  | 0.319 |
| 50                                                   | 0.124  | 0.482  | 0.685 | 0.348  | 0.311 | 0.372    | 0.335 | 0.422  | 0.394 |
| 70                                                   | 0.146  | 0.354  | 0.335 | 0.469  | 0.397 | 0.489    | 0.420 | 0.528  | 0.464 |
| 95                                                   | 0.163  | 0.436  | 0.389 | 0.504  | 0.441 | 0.544    | 0.471 | 0.591  | 0.523 |
| 120                                                  | 0.176  | 0.475  | 0.421 | 0.556  | 0.498 | 0.599    | 0.538 | 0.722  | 0.656 |
| 150                                                  | 0.217  | 0.510  | 0.490 | 0.690  | 0.611 | 0.717    | 0.633 | 0.840  | 0.762 |
| 185                                                  | 0.236  | 0.631  | 0.608 | 0.836  | 0.738 | 0.854    | 0.756 | 1.007  | 0.899 |
| 240                                                  | 0.273  | 0.750  | 0.726 | 1.002  | 0.842 | 1.079    | 0.952 | 1.238  | 1.119 |
| 300                                                  | 0.303  | 0.919  | 0.887 | 1.161  | 1.012 | 1.170    | 1.031 | 1.457  | 1.414 |
| 400                                                  | 0.372  | 1.093  | 1.040 | 1.376  | 1.283 | 1.545    | 1.379 | 1.778  | 1.626 |
| 500                                                  | 0.413  | 1.342  | -     | 1.568  | 1.400 | 1.806    | 1.456 | -      | -     |
| 630                                                  | 0.469  | 1.546  | -     | -      | -     | -        | -     | -      | -     |
| 800                                                  | 0.569  | -      | -     | -      | -     | -        | -     | -      | -     |
| 1000                                                 | 0.667  | -      | -     | -      | -     | -        | -     | -      | -     |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 2017

TABLE XL1  
VARIATION FACTOR FOR XLPE COMPOUND ( XLFAL/XLFCU )  
XLPE INSULATED 1.1 KV POWER CABLES WITH COPPER/ALUMINIUM CONDUCTOR

| Nominal cross<br>Sectional Area<br>(in Sq. mm) | 1 core |       | 2 core |       | 3 core |       | 3.5 core |       | 4 core |       |
|------------------------------------------------|--------|-------|--------|-------|--------|-------|----------|-------|--------|-------|
|                                                | Unarm  | Arm   | Unarm  | Arm   | Unarm  | arm   | Unarm    | Arm   | Unarm  | arm   |
| 2.5                                            | 0.007  | 0.010 | 0.014  | 0.014 | 0.021  | 0.021 |          |       | 0.028  | 0.028 |
| 4                                              | 0.009  | 0.012 | 0.018  | 0.018 | 0.027  | 0.027 |          |       | 0.036  | 0.036 |
| 6                                              | 0.010  | 0.015 | 0.022  | 0.022 | 0.033  | 0.033 |          |       | 0.043  | 0.043 |
| 10                                             | 0.013  | 0.018 | 0.025  | 0.025 | 0.039  | 0.039 |          |       | 0.053  | 0.053 |
| 16                                             | 0.016  | 0.023 | 0.034  | 0.034 | 0.049  | 0.049 |          |       | 0.065  | 0.065 |
| 25                                             | 0.021  | 0.030 | 0.048  | 0.048 | 0.070  | 0.070 | 0.084    | 0.084 | 0.093  | 0.093 |
| 35                                             | 0.025  | 0.035 | 0.059  | 0.059 | 0.084  | 0.084 | 0.099    | 0.099 | 0.112  | 0.112 |
| 50                                             | 0.033  | 0.044 | 0.075  | 0.075 | 0.108  | 0.108 | 0.130    | 0.130 | 0.144  | 0.144 |
| 70                                             | 0.042  | 0.054 | 0.095  | 0.095 | 0.137  | 0.137 | 0.160    | 0.160 | 0.179  | 0.179 |
| 95                                             | 0.048  | 0.062 | 0.110  | 0.110 | 0.160  | 0.160 | 0.190    | 0.190 | 0.211  | 0.211 |
| 120                                            | 0.060  | 0.076 | 0.138  | 0.138 | 0.200  | 0.200 | 0.239    | 0.239 | 0.266  | 0.266 |
| 150                                            | 0.078  | 0.095 | 0.180  | 0.180 | 0.259  | 0.259 | 0.296    | 0.296 | 0.344  | 0.344 |
| 185                                            | 0.097  | 0.116 | 0.224  | 0.224 | 0.324  | 0.324 | 0.369    | 0.369 | 0.430  | 0.430 |
| 240                                            | 0.116  | 0.137 | 0.266  | 0.266 | 0.388  | 0.388 | 0.446    | 0.446 | 0.518  | 0.518 |
| 300                                            | 0.138  | 0.164 | 0.325  | 0.325 | 0.467  | 0.467 | 0.540    | 0.540 | 0.620  | 0.620 |
| 400                                            | 0.175  | 0.214 | 0.357  | 0.357 | 0.536  | 0.536 | 0.619    | 0.619 | 0.714  | 0.714 |
| 500                                            | 0.217  | 0.260 | 0.440  | 0.440 | 0.660  | 0.660 | 0.769    | 0.769 | 0.880  | 0.880 |
| 630                                            | 0.265  | 0.318 | 0.542  | 0.542 | 0.814  | 0.814 | 0.941    | 0.941 | 1.085  | 1.085 |
| 800                                            | 0.323  | 0.389 |        |       |        |       |          |       |        |       |
| 1000                                           | 0.375  | 0.444 |        |       |        |       |          |       |        |       |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

**TABLE XL2**  
**VARIATION FACTOR FOR XLPE COMPOUND (XLFCU)**  
**XLPE INSULATED CONTROL CABLES WITH COPPER CONDUCTOR**

| No of cores | Core size 1.5 sq mm |       | Core size 2.5 sq mm |       |
|-------------|---------------------|-------|---------------------|-------|
|             | Unarm               | Arm   | Unarm               | Arm   |
| 2           | 0.010               | 0.010 | 0.012               | 0.012 |
| 3           | 0.016               | 0.016 | 0.018               | 0.018 |
| 4           | 0.021               | 0.021 | 0.025               | 0.025 |
| 5           | 0.026               | 0.026 | 0.031               | 0.031 |
| 6           | 0.031               | 0.031 | 0.037               | 0.037 |
| 7           | 0.036               | 0.036 | 0.043               | 0.043 |
| 8           | 0.036               | 0.036 | 0.043               | 0.043 |
| 9           | 0.042               | 0.042 | 0.049               | 0.049 |
| 10          | 0.052               | 0.052 | 0.061               | 0.061 |
| 12          | 0.062               | 0.062 | 0.074               | 0.074 |
| 14          | 0.073               | 0.073 | 0.086               | 0.086 |
| 16          | 0.083               | 0.083 | 0.098               | 0.098 |
| 18          | 0.094               | 0.094 | 0.110               | 0.110 |
| 19          | 0.099               | 0.099 | 0.116               | 0.116 |
| 20          | 0.104               | 0.104 | 0.123               | 0.123 |
| 24          | 0.125               | 0.125 | 0.147               | 0.147 |
| 27          | 0.140               | 0.140 | 0.165               | 0.165 |
| 30          | 0.156               | 0.156 | 0.184               | 0.184 |
| 37          | 0.192               | 0.192 | 0.227               | 0.227 |
| 44          | 0.229               | 0.229 | 0.270               | 0.270 |
| 52          | 0.270               | 0.270 | 0.319               | 0.319 |
| 61          | 0.317               | 0.317 | 0.374               | 0.374 |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

TABLE XL3

VARIATION FACTOR FOR XLPE( XLFAL/XLFCU)

SINGLE CORE ARMoured /UNARMoured XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH  
CU / AL CONDUCTOR

| Nominal Cross<br>Sectional Area<br>(in Sq. mm.) | XLPE Factor for Armoured/ Unarmoured Cable with AL/CU Conductor |            |                           |            |           |           |
|-------------------------------------------------|-----------------------------------------------------------------|------------|---------------------------|------------|-----------|-----------|
|                                                 | 3.3 KV                                                          | 6.6 KV (E) | 11 KV (E)/<br>6.6 KV (UE) | 11 KV (UE) | 22 KV (E) | 33 KV (E) |
| 25                                              | 0.110                                                           | 0.131      | 0.170                     | 0.279      |           |           |
| 35                                              | 0.122                                                           | 0.137      | 0.175                     | 0.284      | 0.317     | 0.522     |
| 50                                              | 0.135                                                           | 0.151      | 0.191                     | 0.307      | 0.341     | 0.563     |
| 70                                              | 0.155                                                           | 0.172      | 0.215                     | 0.342      | 0.379     | 0.615     |
| 95                                              | 0.174                                                           | 0.193      | 0.241                     | 0.377      | 0.417     | 0.670     |
| 120                                             | 0.192                                                           | 0.212      | 0.262                     | 0.407      | 0.449     | 0.713     |
| 150                                             | 0.209                                                           | 0.229      | 0.283                     | 0.437      | 0.481     | 0.757     |
| 185                                             | 0.228                                                           | 0.250      | 0.308                     | 0.471      | 0.518     | 0.809     |
| 240                                             | 0.255                                                           | 0.279      | 0.343                     | 0.519      | 0.569     | 0.883     |
| 300                                             | 0.280                                                           | 0.322      | 0.372                     | 0.560      | 0.613     | 0.943     |
| 400                                             | 0.326                                                           | 0.392      | 0.420                     | 0.625      | 0.683     | 1.041     |
| 500                                             | 0.388                                                           | 0.461      | 0.469                     | 0.694      | 0.757     | 1.142     |
| 630                                             | 0.467                                                           | 0.520      | 0.529                     | 0.777      | 0.845     | 1.265     |
| 800                                             | 0.567                                                           | 0.593      | 0.602                     | 0.874      | 0.949     | 1.407     |
| 1000                                            | 0.656                                                           | 0.665      | 0.660                     | 0.955      | 1.036     | 1.525     |

Note : XLPE factors include Semicons for Conductor & Insulation screen

TABLE - XL4

VARIATION FACTOR FOR XLPE (CCF1A/ / CCF1Cu)

3 CORE XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR

| Nominal Cross<br>Sectional Area<br>(in Sq. mm) | 3.3 KV<br>ARM | 6.6 KV (E)<br>ARM | 6.6 KV (UE) /<br>11 KV (E)<br>ARM | 11 KV (UE)<br>ARM | 22 KV (E)<br>ARM | 33 KV (E)<br>ARM |
|------------------------------------------------|---------------|-------------------|-----------------------------------|-------------------|------------------|------------------|
| 25                                             | 0.315         | 0.394             | 0.511                             | 0.838             |                  |                  |
| 35                                             | 0.339         | 0.427             | 0.545                             | 0.880             | 0.982            | 1.638            |
| 50                                             | 0.378         | 0.474             | 0.600                             | 0.957             | 1.065            | 1.751            |
| 70                                             | 0.435         | 0.541             | 0.679                             | 1.067             | 1.183            | 1.916            |
| 95                                             | 0.489         | 0.604             | 0.755                             | 1.171             | 1.295            | 2.071            |
| 120                                            | 0.537         | 0.661             | 0.822                             | 1.265             | 1.396            | 2.210            |
| 150                                            | 0.585         | 0.719             | 0.890                             | 1.359             | 1.497            | 2.350            |
| 185                                            | 0.642         | 0.784             | 0.968                             | 1.468             | 1.614            | 2.513            |
| 240                                            | 0.717         | 0.873             | 1.074                             | 1.615             | 1.773            | 2.732            |
| 300                                            | 0.781         | 1.006             | 1.167                             | 1.744             | 1.928            | 2.919            |
| 400                                            | 0.886         | 1.227             | 1.314                             | 1.948             | 2.130            | 3.229            |
| 500                                            | 0.956         | 1.421             | 1.445                             | 2.148             | 2.381            | 3.538            |
| 630                                            | 1.129         | 1.582             | 1.609                             | 2.382             | 2.630            | 3.940            |

Note : XLPE factors include Semicons for Conductor & Insulation screen

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

**TABLE H1**  
**VARIATION FACTOR FOR ALUMINIUM (AIF)**  
**ALUMINIUM ARMoured SINGLE CORE XLPE INSULATED 3.3 TO 33 KV CABLES**

| Nominal Cross Sectional Area (in Sq. mm.) | Aluminium Factor for Aluminium Armoured Cable with Aluminium Conductor |            |                        |            |           |           |
|-------------------------------------------|------------------------------------------------------------------------|------------|------------------------|------------|-----------|-----------|
|                                           | 3.3 KV                                                                 | 6.6 KV (E) | 11 KV (E)/ 6.6 KV (UE) | 11 KV (UE) | 22 KV (E) | 33 KV (E) |
| 35                                        | 0.251                                                                  | 0.284      | 0.301                  | 0.344      | 0.358     | 0.473     |
| 50                                        | 0.312                                                                  | 0.336      | 0.352                  | 0.397      | 0.408     | 0.672     |
| 70                                        | 0.385                                                                  | 0.409      | 0.423                  | 0.469      | 0.501     | 0.723     |
| 95                                        | 0.476                                                                  | 0.500      | 0.518                  | 0.637      | 0.656     | 0.856     |
| 120                                       | 0.561                                                                  | 0.586      | 0.601                  | 0.726      | 0.744     | 0.949     |
| 150                                       | 0.653                                                                  | 0.678      | 0.696                  | 0.823      | 0.842     | 1.050     |
| 185                                       | 0.773                                                                  | 0.797      | 0.893                  | 0.949      | 0.965     | 1.183     |
| 240                                       | 0.997                                                                  | 1.063      | 1.083                  | 1.139      | 1.154     | 1.387     |
| 300                                       | 1.209                                                                  | 1.271      | 1.283                  | 1.333      | 1.307     | 1.753     |
| 400                                       | 1.438                                                                  | 1.556      | 1.565                  | 1.620      | 1.636     | 2.046     |
| 500                                       | 1.873                                                                  | 1.901      | 1.910                  | 2.110      | 2.128     | 2.484     |
| 630                                       | 2.337                                                                  | 2.361      | 2.369                  | 2.580      | 2.595     | 2.978     |
| 800                                       | 3.007                                                                  | 3.071      | 3.080                  | 3.145      | 3.163     | 3.588     |
| 1000                                      | 3.737                                                                  | 3.741      | 3.749                  | 3.804      | 3.822     | 4.565     |

**TABLE H2**  
**VARIATION FACTOR FOR POLYMER (CCFAI / CCFCu)**  
**3 CORE XLPE INSULATED 3.3 to 33 KV POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR**

| Nominal Cross Sectional Area (in Sq. mm) | 3.3 KV ARM | 6.6 KV (E) ARM | 6.6 KV (UE) / 11 KV (E) ARM | 11 KV (UE) ARM | 22 KV (E) ARM | 33 KV (E) ARM |
|------------------------------------------|------------|----------------|-----------------------------|----------------|---------------|---------------|
| 35                                       | 0.374      | 0.990          | 1.142                       | 1.604          | 1.782         | -             |
| 50                                       | 0.445      | 1.119          | 1.260                       | 1.834          | 2.046         | 2.864         |
| 70                                       | 0.547      | 1.290          | 1.396                       | 2.011          | 2.284         | 3.219         |
| 95                                       | 0.594      | 1.440          | 1.647                       | 2.269          | 2.428         | 3.367         |
| 120                                      | 0.732      | 1.692          | 1.877                       | 2.498          | 2.715         | 3.646         |
| 150                                      | 0.812      | 1.906          | 2.061                       | 2.767          | 2.931         | 3.927         |
| 185                                      | 0.960      | 2.086          | 2.406                       | 3.028          | 3.180         | 4.166         |
| 240                                      | 1.130      | 2.484          | 2.744                       | 3.398          | 3.580         | 4.589         |
| 300                                      | 1.219      | 2.912          | 3.161                       | 3.840          | 4.016         | 5.029         |
| 400                                      | 1.313      | 3.530          | 3.664                       | 4.353          | 4.666         | 5.736         |
| 500                                      | 1.652      | 3.925          | 3.971                       | 4.621          | 4.878         | 5.913         |
| 630                                      | 1.949      | 4.487          | 4.982                       | 5.225          | 5.477         | 6.696         |

Fillers added in PVC consumption

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

TABLE H3  
VARIATION FACTOR FOR STEEL (FeF)  
XLPE INSULATED 3.3 TO 33 KV POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR

| Nominal Cross<br>Sectional Area<br>Sq. mm. | 3.3 KV | 6.6 KV (E) | 11 KV (E) / 6.6<br>KV (UE) | 11 KV (UE) | 22 KV (E) | 33 KV (E) |
|--------------------------------------------|--------|------------|----------------------------|------------|-----------|-----------|
| 25                                         | 0.551  | 0.604      | 0.656                      | 0.814      |           |           |
| 35                                         | 0.645  | 0.645      | 0.731                      | 0.879      | 0.937     | -         |
| 50                                         | 0.675  | 0.703      | 0.761                      | 0.937      | 0.966     | 1.181     |
| 70                                         | 0.761  | 0.761      | 0.849                      | 0.996      | 1.055     | 1.289     |
| 95                                         | 0.820  | 0.849      | 0.907                      | 1.083      | 1.113     | 1.348     |
| 120                                        | 0.879  | 0.907      | 0.966                      | 1.142      | 1.172     | 1.406     |
| 150                                        | 0.966  | 0.966      | 1.055                      | 1.201      | 1.259     | 1.494     |
| 185                                        | 1.025  | 1.055      | 1.113                      | 1.259      | 1.318     | 1.553     |
| 240                                        | 1.142  | 1.142      | 1.231                      | 1.377      | 1.406     | 1.641     |
| 300                                        | 1.231  | 1.259      | 1.318                      | 1.465      | 1.524     | 1.758     |
| 400                                        | 1.348  | 1.406      | 1.435                      | 1.582      | 1.641     | 1.876     |

IEEMA (PVC)/CABLE(R-1)/2017

Effective from: 1<sup>st</sup> November 217

**TABLE H4**  
**VARIATION FACTOR FOR ALUMINIUM (AIF)**  
**XLPE INSULATED SINGLE CORE 3.3 TO 33 KV POWER CABLES WITH COPPER CONDUCTOR**

| Nominal Cross Sectional Area (in Sq. mm.) | Aluminium Factor for Aluminium Armoured Cable with Copper Conductor |            |                           |            |           |           |
|-------------------------------------------|---------------------------------------------------------------------|------------|---------------------------|------------|-----------|-----------|
|                                           | 3.3 KV                                                              | 6.6 KV (E) | 11 KV (E)/<br>6.6 KV (UE) | 11 KV (UE) | 22 KV (E) | 33 KV (E) |
| 35                                        | 0.153                                                               | 0.187      | 0.204                     | 0.247      | 0.258     | 0.372     |
| 50                                        | 0.179                                                               | 0.203      | 0.220                     | 0.262      | 0.275     | 0.425     |
| 70                                        | 0.196                                                               | 0.219      | 0.233                     | 0.278      | 0.311     | 0.444     |
| 95                                        | 0.213                                                               | 0.237      | 0.254                     | 0.373      | 0.392     | 0.470     |
| 120                                       | 0.228                                                               | 0.253      | 0.268                     | 0.393      | 0.410     | 0.488     |
| 150                                       | 0.243                                                               | 0.269      | 0.287                     | 0.414      | 0.432     | 0.504     |
| 185                                       | 0.261                                                               | 0.285      | 0.381                     | 0.437      | 0.455     | 0.526     |
| 240                                       | 0.324                                                               | 0.389      | 0.410                     | 0.465      | 0.480     | 0.556     |
| 300                                       | 0.365                                                               | 0.428      | 0.440                     | 0.490      | 0.510     | 0.737     |
| 400                                       | 0.432                                                               | 0.471      | 0.480                     | 0.536      | 0.552     | 0.783     |
| 500                                       | 0.489                                                               | 0.517      | 0.526                     | 0.726      | 0.744     | 0.844     |
| 630                                       | 0.544                                                               | 0.568      | 0.572                     | 0.787      | 0.801     | 0.902     |
| 800                                       | 0.706                                                               | 0.787      | 0.797                     | 0.862      | 0.880     | 0.982     |
| 1000                                      | 0.824                                                               | 0.865      | 0.867                     | 0.923      | 0.940     | 1.324     |

**TABLE - H5**  
**VARIATION FACTOR FOR STEEL (FeW)**  
**XLPE INSULATED 3.3KV TO 33 KV POWER CABLES WITH COPPER / ALUMINIUM CONDUCTOR**

| Nominal Cross Sectional Area in Sq. mm | 3.3/3.3 KV | 3.3/6.6 KV | 11 KV (E) /<br>6.6 KV (UE) | 11 KV (UE) | 22 KV (E) | 33 KV (E) |
|----------------------------------------|------------|------------|----------------------------|------------|-----------|-----------|
| 25                                     | 1.258      | 1.457      | 1.612                      | 2.509      | 1.503     | --        |
| 35                                     | 1.361      | 1.569      | 1.853                      | 2.644      | 2.797     | 2.517     |
| 50                                     | 1.682      | 1.687      | 2.321                      | 2.800      | 2.921     | 4.569     |
| 70                                     | 2.033      | 1.979      | 2.503                      | 3.219      | 3.347     | 4.809     |
| 95                                     | 2.202      | 2.507      | 2.718                      | 4.019      | 4.200     | 5.437     |
| 120                                    | 2.371      | 2.675      | 2.882                      | 4.241      | 4.416     | 6.713     |
| 150                                    | 2.870      | 2.847      | 3.265                      | 4.447      | 4.621     | 6.976     |
| 185                                    | 3.121      | 3.309      | 4.148                      | 4.726      | 5.289     | 7.356     |
| 240                                    | 3.758      | 4.227      | 4.442                      | 5.442      | 6.651     | 7.718     |
| 300                                    | 4.099      | 5.024      | 5.182                      | 6.894      | 7.084     | 8.187     |
| 400                                    | 5.750      | 6.572      | 6.658                      | 7.433      | 7.657     | 8.760     |
| 500                                    | 6.716      | 6.777      | 6.861                      | 7.588      | 7.797     | 8.830     |
| 630                                    | 7.492      | 7.465      | 7.477                      | 8.209      | 8.386     | 9.413     |