

Cir. No.: 140/ PVC/DT_PT/05

November 10, 2021

To All Members of Distribution Transformers Division, SEBs and other listed purchasing bodies.

**Sub: Revision in Price Variation Formulae for Power and Distribution Transformers
Evolution of new PV formulae for Solar Inverter Duty Transformers**

In light of changes in technology, manufacturing practises and substantial fluctuations in raw material prices over past 6-7 years, IEEMA has decided to revise PV Clauses for Power and Distribution Transformers and evolve new PV formulae for Solar Inverter Duty Transformers considering huge potential of Solar Inverter Duty Transformers in coming period as Renewable and clean energy resources (Solar and Wind) is going to play a major role in the Generation mix.

IEEMA had circulated draft PV clauses of Power and Distribution Transformer and new formula for Solar Inverter Duty Transformers vide Cir. No. 134/PVC/DT_PT/05 dated 30 September 2021. After incorporating changes suggested by the industry stakeholders on the Distribution Transformer PV formulae; we are making all these Price Variation formulae operational from 1st September 2021.

We have enclosed all PV clauses applicable for Power and Distribution Transformer and new formula for Solar Inverter Duty Transformers which are effective from 1st September 2021.

Although, these PV clauses are made effective from 1st September 2021, practically they can be incorporated in all the current new tenders/contracts starting from 1st October 2021.

We request and recommend all the users & stakeholders including Utilities, PSUs etc. to incorporate these PV formulae in all the new tenders/contracts henceforth.

Salient points of the revised Transformer PV formulae:

1. As per contemporary tendering processes, to cover Dist. Transformers of above 10 MVA and Up to 33 KV DTs, definition of Distribution Transformers has been proposed as Transformers Up to 33 KV and definition of Power Transformers has been proposed as Transformers above 33 KV
2. The PV formulae for Distribution Transformers have been made generic by removing reference of BEE or IS 1180 from all PV formulae since practically now almost all Transformers up to 2,500 KVA are manufactured as per IS 1180 and these PV formulae can also be used for non BIS /Non BEE purposes also; if required
3. It was decided to discontinue old PV formulae for Non BIS/Non BEE DTs effective from June 2015 and subsequently discontinuation of publishing applicable price of other CRGO Steel Lamination and price of Aluminium rod (Domestic) from the monthly PV circulars.
4. Copper price source has been proposed as Domestic Copper price of 8 mm since majority of manufacturers procure it locally and it also aligns to price published in other IEEMA PV circulars
5. Common price of CRGO Laminations to be used for all proposed PV formulae
6. Change in lead time period prior to date of delivery for some PV formulae as per contemporary manufacturing practises.



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7. Cost weightages for Distribution Transformer PVCs have been re-worked and revised post the suggestions received from industry stakeholders on the Draft PV formulae.

For pending contracts, for the date of delivery as given below, to arrive at the final price variation, we recommend using the following two stage method, which is a standard institutionalized methodology adopted by IEEMA for change over in all IEEMA PV clauses. Applicability of this two stage method is recommended as under:

For Power Transformer up to 400 KV – For Delivery on or after 1st December 2021

For Power Transformer Above 400 KV – For Delivery on or after 1st January 2022

For Distribution Transformer – For Delivery on or after 1st November 2021

1. Calculate price variation 'P' from applicable prices/indices as per your base date / date of tendering up to September 2021 i.e. considering all prices/indices published in PV circular of September 2021 at numerator place; using applicable IEEMA PV clauses of Transformers effective from April / June 2015
2. Treat the above calculated 'P' as 'P₀' and calculate final price variation considering all prices / indices published in PV circular of September 2021 applicable for revised PV clauses of Transformer effective from 1st September 2021 as base prices/indices (at the denominator place) up to the applicable prices/indices as per the date of delivery; applicable as per revised relevant PV clause of Transformer effective from 1st September 2021.

Please find enclosed a sample two stage calculation showing month references for selecting the price/indices as per above method.

Director

Sample calculation showing month references for two stage method

For Power Transformer up to 400 KV --- Two stage method if delivery period falls on or after 1st December 2021

For e.g.		date of tendering - January 2021		Date of delivery - December 2021		
STEP I			STEP II			
	Jan-21	Sep-21		Sep-21	Dec-21	
Prices/ Indices	Month applicable for Date of Tendering as per old PV formula	Month applicable for Date of Delivery (FIXED)	Prices/ Indices	Month applicable for Date of Tendering (FIXED)	Month applicable for Date of Delivery as per new PV formula	
Fix			Fix			
CU	Dec-20	Sep-21	CU	Sep-21	Oct-21	
ES	Dec-20	Sep-21	ES	Sep-21	Oct-21	
IS	Dec-20	Sep-21	IS	Sep-21	Oct-21	
IM	Dec-20	Sep-21	IM	Sep-21	Oct-21	
TO	Dec-20	Sep-21	TO	Sep-21	Nov-21	
W	Oct-20	Jul-21	W	Jul-21	Sep-21	

For Power Transformer Above 400 KV --- Two stage method if delivery period falls on or after 1st January 2022

For e.g.		date of tendering - January 2021		Date of delivery - January 2022		
STEP I			STEP II			
	Jan-21	Sep-21		Sep-21	Jan-22	
Prices/ Indices	Month applicable for Date of Tendering as per old PV formula	Month applicable for Date of Delivery (FIXED)	Prices/ Indices	Month applicable for Date of Tendering (FIXED)	Month applicable for Date of Delivery as per new PV formula	
CU	Dec-20	Sep-21	CU	Sep-21	Oct-21	
ES	Dec-20	Sep-21	ES	Sep-21	Oct-21	
IS	Dec-20	Sep-21	IS	Sep-21	Oct-21	
IM	Dec-20	Sep-21	IM	Sep-21	Oct-21	
TO	Dec-20	Sep-21	TO	Sep-21	Nov-21	
W	Oct-20	Jul-21	W	Jul-21	Oct-21	

In step I calculation,

prices/indices to be taken from circular ref IEEMA(PVC)/PWR_DIST_TRF of applicable month as per old PV formulae wef Apr 2015

In step II calculation,

prices/indices to be taken from circular ref IEEMA(PVC)/PWR_DIST_TRF (R-1) for applicable month as per new PV formulae wef Sep 2021

For Distribution Transformer --- Two stage method if delivery period falls on or after 1st November 2021

For e.g. date of tendering - January 2021			Date of delivery - November 2021		
STEP I			STEP II		
	Jan-21	Sep-21		Sep-21	Nov-21
Prices/ Indices	Month applicable for Date of Tendering as per old PV formula	Month applicable for Date of Delivery (FIXED)	Prices/ Indices	Month applicable for Date of Tendering (FIXED)	Month applicable for Date of Delivery as per new PV formula
Fixed			Fixed		
AL/Cu	Dec-20	Sep-21	AL/Cu	Sep-21	Oct-21
ES	Dec-20	Sep-21	ES	Sep-21	Oct-21
IS	Dec-20	Sep-21	IS	Sep-21	Oct-21
IM	Dec-20	Sep-21	IM	Sep-21	Oct-21
TO	Dec-20	Sep-21	TO	Sep-21	Oct-21
W	Oct-20	Jul-21	W	Jul-21	Aug-21

In step I calculation,

prices/indices to be taken from circular ref IEEMA(PVC)/PWR_DIST_TRF of applicable month as per old PV formulae wef Apr 2015

In step II calculation,

prices/indices to be taken from circular ref IEEMA(PVC)/PWR_DIST_TRF (R-1) for applicable month as per new PV formulae wef Sep 2021

IEEMA/PVC/CU_Solar Inverter Duty TRF/2021

Effective from: 01 September 2021

**PRICE VARIATION CLAUSE FOR COPPER WOUND SOLAR INVERTER DUTY TRANSFORMERS
COMPLETE WITH ALL ACCESSORIES AND COMPONENTS
supplied against domestic contracts**

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices/indices, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P_0}{100} \left(9 + 33 \frac{C}{C_0} + 22 \frac{ES}{ES_0} + 12 \frac{IS}{IS_0} + 6 \frac{IM}{IM_0} + 9 \frac{TO}{TO_0} + 9 \frac{W}{W_0} \right)$$

Wherein,

- P = Price payable as adjusted in accordance with the above formula.
- P₀ = Price quoted/confirmed.
- C₀ = Price of CC copper rods (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.
- ES₀ = Price of CRGO Electrical Steel Lamination (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.
- IS₀ = Price of MS Plate of 6 mm thickness (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.
- IM₀ = Price of Insulating Materials (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.
- TO₀ = Price of Transformer Oil (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.
- W₀ = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, **THREE** months prior to the date of tendering.

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For example, if date of tendering falls in December 2021, applicable prices of Copper (C₀), CRGO Steel Sheets (ES₀), MS Plate (IS₀), Insulating material (IM₀) and Transformer Oil (TO₀), should be as on 1st November 2021 and all India average consumer price index no. (W₀) should be for the month of September 2021.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/_/ **ONE** month prior to the date of tendering.

- C = Price of CC copper rods (refer notes)
 This price is as applicable for the month, **ONE** month prior to the date of delivery.
- ES = Price of CRGO Electrical Steel Lamination (refer notes)
 This price is as applicable for the month, **ONE** month prior to the date of delivery.
- IS = Price of MS Plate of 6 mm thickness (refer notes)
 This price is as applicable for the month, **ONE** month prior to the date of delivery.
- IM = Price of Insulating Materials (refer notes)
 This price is as applicable for the month, **TWO** month prior to the date of delivery.
- TO = Price of Transformer Oil (refer notes)
 This price is as applicable for the month, **ONE** month prior to the date of delivery.
- W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
 This index number is as applicable for the month, **THREE** months prior to the date of delivery.

For example, if date of delivery falls in December 2022, applicable prices of Copper (C), CRGO Steel Sheets (ES), Insulating material (IM) should be as on 1st October 2022 and MS Plate (IS), Transformer Oil (TO) should be as on 1st November 2022 and all India average consumer price index no. (W) should be for the month of September 2022.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/_/ **ONE** month prior to the date of delivery.

The date of delivery is the date on which the transformer 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.

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- Notes:
- a) All prices of raw materials are exclusive of GST amount and exclusive of any other central, state or local taxes etc..
 - b) Date of Tendering is the due date of tender submission or date of tender opening whichever is earlier
 - c) The details of prices are as under:
 1. Price of 8 mm CC copper rods (in Rs./MT) is ex-works price as quoted by the primary producer.
 2. The price of CRGO Electrical Steel Lamination suitable for Transformers of voltage up to 33 KV is the average price as quoted by processing centres of mills and lamination suppliers
 3. Price of steel is the average retail price of MS Plate 6 mm thickness as published by Joint Plant Committee (JPC) in Rs./MT
 4. The average price of Insulating materials (in Rs./Kg) of pre-compressed pressboards of size 3 mm and 10 mm thick, 3200 mm x 4100 mm C&F price in free currency per MT converted into Indian Rupees with applicable exchange rates prevailing as on 1st working day of the month as quoted by primary suppliers. This price is the landed cost, inclusive of applicable customs duty only but exclusive of countervailing duty.
 5. The price of Transformer Oil (in Rs./K.Ltr) is the average price on ex-refinery basis as quoted by primary producers for supply in drums.
 - d) Some purchasers are purchasing oil immersed Transformers from manufacturers without first filling of oil. Oil for first filling is procured and filled by the purchasers. For such supplies PVC formula, excluding Oil will apply as under:

Where description of P, P₀, C, ES, IS, IM, W etc. remains same as mentioned earlier.

$$P = \frac{P_0}{91} \left(9 + 33 \frac{C}{C_0} + 22 \frac{ES}{ES_0} + 12 \frac{IS}{IS_0} + 6 \frac{IM}{IM_0} + 9 \frac{W}{W_0} \right)$$

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**PRICE VARIATION CLAUSE FOR ALUMINIUM WOUND SOLAR INVERTER DUTY TRANSFORMERS
COMPLETE WITH ALL ACCESSORIES AND COMPONENTS
supplied against domestic contracts**

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices/indices, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P_0}{100} \left(9 + 12 \frac{AL}{AL_0} + 3 \frac{C}{C_0} + 29 \frac{ES}{ES_0} + 18 \frac{IS}{IS_0} + 8 \frac{IM}{IM_0} + 12 \frac{TO}{TO_0} + 9 \frac{W}{W_0} \right)$$

Wherein,

- P = Price payable as adjusted in accordance with the above formula.
- P₀ = Price quoted/confirmed.
- AL₀ = LME CSP Average of Aluminium (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.
- C₀ = Price of CC copper rods (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.
- ES₀ = Price of CRGO Electrical Steel Lamination (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.
- IS₀ = Price of MS Plate of 6 mm thickness (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.
- IM₀ = Price of Insulating Materials (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.
- TO₀ = Price of Transformer Oil (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of tendering.
- W₀ = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, **THREE** months prior to the date of tendering.

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For example, if date of tendering falls in December 2021, applicable prices of Aluminium (AL₀), Copper (C₀), Transformer Oil (TO₀), CRGO Steel Sheets (ES₀), MS Plate (IS₀) and Insulating material (IM₀) should be as on 1st November 2021 and all India average consumer price index no. (W₀) should be for the month of September 2021.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/PWR_DIST_TRF (R-1)/ / _ **ONE** month prior to the date of tendering.

- AL = LME CSP Average of Aluminium (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.
- C = Price of CC copper rods (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.
- ES = Price of CRGO Electrical Steel Lamination (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.
- IS = Price of MS Sheet of 6 mm thickness (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.
- IM = Price of Insulating Materials (refer notes)
This price is as applicable for the month, **TWO** month prior to the date of delivery.
- TO = Price of Transformer Oil (refer notes)
This price is as applicable for the month, **ONE** month prior to the date of delivery.
- W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100)
This index number is as applicable for the month, **THREE** months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in December 2022, applicable prices of Aluminium (AL), Copper (C), CRGO Steel Sheets (ES), Insulating material (IM) should be as on 1st October 2022 and Transformer Oil (TO), MS Plate (IS) should be as on 1st November 2022 and all India average consumer price index number (W) should be for the month of September 2022.

The date of delivery is the date on which the transformer 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.

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- Notes: a) All prices of raw materials are exclusive of GST amount and exclusive of any other central, state or local taxes etc.
- b) Date of Tendering is the due date of tender submission or date of tender opening whichever is earlier
- c) The details of prices are as under:
1. Price of 8 mm CC copper rods (in Rs./MT) is ex-works price as quoted by the primary producer.
 2. Price of 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 using exchange rate and adding appropriate customs duty
 3. The price of CRGO Electrical Steel Lamination suitable for Transformers of voltage up to 33 KV is the average price as quoted by processing centres of mills and lamination suppliers
 4. Price of steel is the average retail price of MS Plate 6 mm thickness as published by Joint Plant Committee (JPC) in Rs./MT
 5. The average price of Insulating materials (in Rs./Kg) of pre-compressed pressboards of size 3 mm and 10 mm thick, 3200 mm x 4100 mm C&F price in free currency per MT converted into Indian Rupees with applicable exchange rates prevailing as on 1st working day of the month as quoted by primary suppliers. This price is the landed cost, inclusive of applicable customs duty only but exclusive of countervailing duty.
 6. The price of Transformer Oil (in Rs./K.Ltr) is the average price on ex-refinery basis as quoted by primary producers for supply in drums.
- d) Some purchasers are purchasing oil immersed Transformers from manufacturers without first filling of oil. Oil for first filling is procured and filled by the purchasers. For such supplies PVC formula, excluding Oil will apply as under:

Where description of P, P₀, C, ES, IS, IM, W etc. remains same as mentioned earlier.

$$P = \frac{P_0}{88} \left(9 + 12 \frac{AL}{AL_0} + 3 \frac{C}{C_0} + 29 \frac{ES}{ES_0} + 18 \frac{IS}{IS_0} + 8 \frac{IM}{IM_0} + 9 \frac{W}{W_0} \right)$$


Director

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