REGIONAL PROCUREMENT HUB PROGRAM – REGION 7
SUPPLEMENTAL BID BULLETIN NO. 24-02
FOR THE
PROCUREMENT OF CONSIGNMENT, SUPPLY AND DELIVERY OF DISTRIBUTION TRANSFORMERS
(PB-ITB-R7-2-2024)

In accordance with Section 4.3.2 of Annex "B" of the NEA Memorandum No. 2024-06, this Supplemental Bid Bulletin is hereby issued to clarify, modify or amend the following items for PB-ITB-R7-2-2024:

Section/Item No.	Issue in the Bidding Documents / Technical Specifications	Clarification / Amendment
Section II. Instructions To Bidders		
IB 6.5 Single Largest Completed Contract (SLCC)	A suggestion was made to lower the 50% SLCC requirement.	The suggestion is **not** accepted. The 50% SLCC requirement as provided for in the Bidding Documents is retained.
IB 6.4 to 6.5 Single Largest Completed Contract (SLCC)	An additional written inquiry was made (via e-mail) on whether a bidder may utilize/submit as the SLCC the contract of its Joint Venture (JV) Partner (a foreign company who has no exposure to the Philippine Market or whose market is outside the Philippines)	Based on the information provided, the Contract intended to be submitted is also consummated outside of the Philippines. In this regard, a prospective bidder **cannot** submit, as the SLCC, the contract of its foreign JV Partner who has no previous sales and deliveries in the Philippines. IB Clause 6.4 provides that the SLCC must be **"similar"** to the Project. Considering the multiple logistical obligations imposed on the winning supplier under TOR Clauses 9.1 to 9.17 (*i.e.*, consignment to the R7 RPH and delivery to the Member ECs within the periods provided), a similar contract should be interpreted to mean a contract for the consignment/supply and delivery of Distribution Transformers **consummated/made in the Philippines**.

		For the purpose of clarity, IB Clause 6.5 is ***amended*** to read as follows: "For the purpose of this bidding a similar contract or project shall mean **contracts for the 'consignment, supply and delivery of' or for 'supply and delivery of'** Distribution Transformers within the Philippines."
Section V. Terms of Reference		
TOR 6.2 (Detailed Technical Specifications and applicable Tests for Items E to H)	With respect to **Construction *(Tap Changer),*** there was a clerical error on the numeral assigned to the highest tap (*i.e.,* "2", instead of "1").	TOR 6.2, second Bullet under **Construction *(Tap Changer)*** is ***amended*** as follows: "Tap positions are painted and caution markings are marked with reflectorized, non-weathering decals at least 25 mm (1.0 inch) high. The numeral "1" shall be assigned to the highest tap."
TOR 6.2 (Detailed Technical Specifications and applicable Tests for Items E to H)	With respect to **Tests**, there is a clarification on the Member ECs right to witness the Routine and Design Tests indicated therein.	Member ECs have a right to witness the Routine and Design Tests conducted at the factory level. For the purpose of Clarity, TOR 6.2, Tests, is amended to include the following statement: "The manufacturer shall conduct the Routine and Design Tests to verify that the Distribution Transformers comply with the requirements of this standard. The Member ECs reserve the right to witness the Routine and Design Tests. and the Supplier shall notify the Member ECs **fifteen (15) days** before each test is to be conducted. The Supplier is required to furnish the Member ECs with copies of all test reports."

Section VII. Bid Forms		
Form#4 - Statement of Ongoing and Completed Contracts	The Title of Bid Form #4 did not include "Completed" Contracts. Bid Form#4 was not definitive on the supporting documents to be submitted during post-qualification.	The Title of Bid Form #4 is ***amended*** to include "Completed" Contracts. Bid Form#4 (Statement of Ongoing and Completed Contracts) is ***amended*** to provide a definitive list of supporting documents to be submitted during post-qualification as follows: **(a)** Notice of Award (or equivalent document for private contracts; if no equivalent document print one page stating "NOT Applicable"); **(b)** Notice to Proceed (or equivalent document for private contracts; if no equivalent document print one page stating "NOT Applicable"); **(c)** Contract; **(d)** Purchase Order; **(e)** For on-going Contracts, Certification from the client / project owner that the performance is satisfactory as of the bidding date OR For Completed Contracts, Certification of Acceptance/Completion or equivalent document; and **(f)** Official Receipt or Sales Invoice issued for the Contract. Bid Form#4 was also ***amended*** to include the following statement: *"The NEA SBAC may request additional supporting documents during post-qualification to verify the Bidder's statements/representations herein".* Please see revised Statement of Ongoing and Completed Contracts attached herein as **Annex "A"**.

Form#5 - SLCC	Bid Form#5 (SLCC) was not definitive on the supporting documents to be submitted together with the form.	Bid Form#5 (SLCC) is ***amended*** to provide a definitive list of supporting documents to be submitted together with the form as follows: **(a)** Notice of Award (or equivalent document for private contracts; if no equivalent document print one page stating "NOT Applicable"); **(b)** Notice to Proceed (or equivalent document for private contracts; if no equivalent document print one page stating "NOT Applicable"); **(c)** Contract; **(d)** Purchase Order; **(e)** Certification of Acceptance/Completion or equivalent document; and **(f)** Official Receipt or Sales Invoice issued for the Contract. Bid Form#5 was also ***amended*** to include the following statement: *"The NEA SBAC may request additional supporting documents during post-qualification to verify the Bidder's statements/representations herein".* Please see revised SLCC Form attached herein as **Annex "B"**.
Form#4 - Statement of Ongoing and Completed Contracts Form#5 - SLCC	Clarification was sought on what protocol to follow in the event that the contract(s) to be declared as part of Bid Form Form#4 or to be declared and submitted as the SLCC under Bid Form#5 are denominated in US Dollar.	Bid Form#5 (SLCC) is ***amended*** to provide a definitive list of supporting documents to be submitted together with the form as follows: **(a)** Notice of Award (or equivalent document for private contracts; if no equivalent document print one page stating "NOT Applicable"); **(b)** Notice to Proceed (or equivalent document for private contracts; if no equivalent document print one page stating "NOT Applicable");

		(c) Contract; **(d)** Purchase Order; **(e)** Certification of Acceptance/Completion or equivalent document; and **(f)** Official Receipt or Sales Invoice issued for the Contract. Bid Form#5 was also ***amended*** to include the following statement: *"The NEA SBAC may request additional supporting documents during post-qualification to verify the Bidder's statements/representations herein".* Please see revised SLCC Form attached herein as **Annex "B"**.
Form#6 - NFCC	Bid Form#6 (NFCC) does not include the "Value of all outstanding/uncompleted contracts" as one of the Particulars required to be indicated.	Bid Form#6 (NFCC) is ***amended*** to include "Value of all outstanding/uncompleted contracts" as one of the Particulars required to be indicated. Please see revised NFCC Form attached herein as **Annex "C"**.
Form#10 - Details of Technical Specifications	Bid Form#10 (Details of Technical Specifications) requires revisions to conform with the revision to Clause 6.2 of the TOR as provided above.	Bid Form#10 (Details of Technical Specifications) is ***amended*** to conform with the revisions to Clause 6.2 of the TOR. Please see revised Details of Technical Specifications Form attached herein as **Annex "D"**.
Section III. Instructions to Bidders & Section VI. Checklist of Eligibility Requirements and Bid Proposals		
IB Clause 12.3 & Item II (E) of Checklist of Eligibility Requirements and Bid Proposals.	1. The Second Form of Bid Security provides: "Bank draft/ Guarantee or irrevocable letter of credit issued by a universal or commercial bank". However, it does not	1. The Second Form of Bid Security under IB Clause 12.3 & Item II (E) of the Checklist of Eligibility Requirements and Bid Proposals is ***amended*** as follows: "Bank draft/

	contain the following statement which is found for the similar form of Performance Securities: "Provided, however, that it shall be confirmed or authenticated by a Universal or Commercial Bank, if issued by a foreign bank". 2. The Amounts for the Second and Third Forms of Bid Securities respectively state: "2% of the ABC of the Members EC's Respective Share in the Total ABC as provided for under IB Clause 2.3" and "5% of the ABC of the Members EC's Respective Share in the Total ABC as provided for under IB Clause 2.3".	Guarantee or irrevocable letter of credit issued by a universal or commercial bank. Provided, however, that it shall be confirmed or authenticated by a Universal or Commercial Bank, if issued by a foreign bank." 2. The Amounts for the Second and Third Forms of Bid Securities under IB Clause 12.3 & Item II (E) of the Checklist of Eligibility Requirements and Bid Proposals is respectively ***amended*** as follows: "2% of the Members EC's Respective Share in the Total ABC as provided for under IB Clause 2.3" and "5% of the Members EC's Respective Share in the Total ABC as provided for under IB Clause 2.3". Please see revised Table for the Form and Amount of Bid Securities attached herein as **Annex "D"**.

Issued this __ day of July 2024 for the guidance and information of all concerned.

ATTY. OSWALDO F. GABAT
Member
NEA RPH SBAC

MS. IRENE C. MARTIN
Member
NEA RPH SBAC

ENGR. EXEQUIEL T. EVALE, JR.
Member
NEA RPH SBAC

MS. ROSIE M. ALAMILLO
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NEA RPH SBAC

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ATTY. ALEXANDER PAUL T. RIVERA
Vice-Chairperson
NEA RPH SBAC

ENGR. ERNESTO O. SILVANO, JR.
Chairperson
NEA RPH SBAC

APPROVED:

ANTONIO MARIANO C. ALMEDA
Administrator

NATIONAL ELECTRIFICATION ADMINISTRATION
Office of the Administrator
NEA-OA274926

CONFORME:

VIRGILIO C. FORTICH
President
Region VII Electric Cooperative Association, Inc.
Confirmed Regional Association.

Form#4: Statement of Ongoing and Completed Contracts

Statement of all Completed and Ongoing Government & Private Contracts including Contracts Awarded But Not Yet Started

The bidder shall declare in this form all on going government and private contracts including contracts where the bidder is a partner in a Joint Venture agreement other than his current Joint Venture where he is a partner. Non-declaration will be a ground for the disqualification of bid.

Business Name : [Name of Bidder]
Business Type : [Manufacturer, Distributor or Supplier]
Business Address : _____

Name of Contract / Project Cost	Date of Contract	Contract Duration	Owner's Name and Address	Kinds of Goods	Date of Delivery/Completion	Amount		End user's acceptance or official receipt(s) or sales invoice issued for the contract
						Contract	Value of Outstanding Contract	
GOVERNMENT								
PRIVATE								
					TOTAL COST			

Note: 1.This statement shall be supported with the following documents for all contracts stated in this form **which shall be submitted during post-qualification**: **(a)** Notice of Award (or equivalent document for private contracts; if no equivalent document print one page stating "NOT Applicable"); **(b)** Notice to Proceed (or equivalent document for private contracts; if no equivalent document print one page stating "NOT Applicable"); **(c)** Contract; **(d)** Purchase Order; **(e)** For on-going Contracts, Certification from the client / project owner that the performance is satisfactory as of the bidding date OR For Completed Contracts, Certification of Acceptance/Completion or equivalent document; and **(f)** Official Receipt or Sales Invoice issued for the Contract.

2. In the event, that the contracts are denominated in foreign currency the following protocol shall be followed in accomplishing this form: **(a)** the Contract Amount must be converted to Philippine Peso using the applicable exchange rate as of Invoice Date; and **(b)** the exchange rate to be used must be based

on the Daily Reference Exchange Rate Bulletin (RERB) issued by the Bangko Sentral ng Pilipinas (BSP); and **(c)** the Bidder must submit the relevant Daily RERB issued by the BSP during the post-qualification stage.

3. The NEA SBAC may request additional supporting documents during post-qualification to verify the Bidder's statements/representations herein

Submitted by : _____
Printed Name & Signature
Designation : _____
Date : _____

Form#5: SLCC

Statement of Bidder's Single Largest Completed Contract (SLCC)

Business Name : [Name of Bidder]
Business Type : [Manufacturer, Distributor or Supplier]
Business Address : _____

Name of Contract	Nature and description of the project	Owner's Name and Address	Date of Contract	Contract Duration	Date of Delivery/ Completion	Contract Amount	End user's acceptance or official receipt(s) or sales invoice issued for the contract

Note: 1. The bidder must state only one (1) Single Largest Completed Contract (SLCC) Similar to the contract to be bid.

2. This statement shall be supported the following documents for the contract stated in this form **which shall be submitted together with this form as part of Envelope 1**: **(a)** Notice of Award (or equivalent document for private contracts; if no equivalent document print one page stating "NOT Applicable"); **(b)** Notice to Proceed (or equivalent document for private contracts; if no equivalent document print one page stating "NOT Applicable"); **(c)** Contract; **(d)** Purchase Order; **(e)** Certification of Acceptance/Completion or equivalent document; and **(f)** Official Receipt or Sales Invoice issued for the Contract.

3. In the event, that the SLCC is denominated in foreign currency the following protocol shall be followed in accomplishing this form: **(a)** the Contract Amount must be converted to Philippine Peso using the applicable exchange rate as of Invoice Date; and **(b)** the exchange rate to be used must be based on the Daily Reference Exchange Rate Bulletin (RERB) issued by the Bangko Sentral ng Pilipinas (BSP); and **(c)** the Bidder must attach the relevant Daily RERB issued by the BSP together with the SLCC Form

4. The NEA SBAC may request additional supporting documents during post-qualification to verify the Bidder's statements/representations herein.

Submitted by : _____
Printed Name & Signature
Designation : _____
Date : _____

Form#6: NFCC

Net Financial Contracting Capacity (NFCC)

A. Summary of the Applicant Supplier's/Distributor's/Manufacturer's assets and liabilities on the basis of the attached income tax return and audited financial statement, stamped "RECEIVED" Bureau of Internal Revenue or BIR authorized collecting agent, for the immediately preceding year.

	PARTICULARS	AMOUNT
1	Total Assets	
2	Current Assets	
3	Total Liabilities	
4	Current Liabilities	
5	Net Worth (1-3)	
6	Net Working Capital (2-4)	
7	Value of all Outstanding/Uncompleted Contracts*	

**Item No. 7 shall be based on the Total value of Outstanding Contracts indicated in the Bidder's Form No. 4 (Statement of Ongoing and Completed Contracts).*

B. The Net Financial Contracting Capacity (NFCC) based on the above data is computed as follows:

NFCC = [(Current assets minus current liabilities) (15)] minus the value of all outstanding or uncompleted portions of the projects under ongoing contracts, including awarded contracts yet to be started, coinciding with the contract to be bid.

NFCC =

Submitted by:

_____
Name of Supplier/Distributor/Manufacturer

_____
Signature of Authorized Representative

Form#10: Details of Technical Specifications

(Letterhead of the Bidder)

Date: _____, 2024

NEA Special Bids and Awards Committee (NEA SBAC)
#57 NEA Building, NIA Road,
Barangay Pinyahan, Government Center Diliman,
Quezon City

Attention: **Engr. Ernesto O. Silvano, Jr.**
Chairperson of the NEA SBAC
for the RPH Program

Subject: Details of Technical Specifications of [Name of Bidder]

Detailed Technical Specifications for: *Items A to D (Transformers, Pole Type, Conventional, 15kVA to 50 kVA, Cu-Cu-Al Winding)*			
Particulars	**Specifications Prescribed in Bidding Documents**	**Statement of Compliance**	**Details of Added Technical Specifications (if any)**
Scope	This Technical Specification covers the single-phase, overhead-type, oil-immersed, self-cooled, silicon steel core, brand new and PCB-Free distribution transformers under Items A to D, with primary voltage rating of 7620/13200 V, and secondary voltage rating of 120/240 V.		
Site and Service Conditions	Transformers conforming to this specification shall be suitable for operation at rated kVA in a tropical environment and under the following service conditions: • Maximum altitude above sea level - 1000 m • Maximum ambient temperature - 40° C • Average ambient temperature - 30° C		

Applicable Standards	All transformers furnished under this specification shall be designed, manufactured and tested to meet or exceed the requirements of the latest revision of the following IEEE, ANSI/IEEE, NEMA and ASTM Standards or equivalent IEC standards: • IEEE Std C57.12.00 - Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers • IEEE Std C57.12.20 - Requirements for Overhead-Type Distribution Transformers, 500 kVA and Smaller; High-voltage, 13200 Volts and Below; Low-voltage, 7970/13800 Y Volts and Below • IEEE Std C57.12.70 - Terminal Markings and Connections for Distribution and Power Transformers • IEEE Std C57.12.90 - Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers and Guide for Short Circuit Testing of Distribution and Power Transformers • ANSI/IEEE Std C57.92 - Guide for Loading Mineral-Oil-Immersed Power Transformers • NEMA Standards Publication No. TR 1 - Transformers, Regulators and Reactors • ASTM D3487 - Specifications for Mineral Insulating Oil Used in Electrical Apparatus		
Environmental Compliance	PCB Free		

<table>
<tr>
<td>Electrical Characteristics</td>
<td>
<u>Voltage and Rating Taps</u>

• The transformer primary voltage rating shall be specified based on the rating shown in the Table below:

<table>
<tr><th colspan="3">Standard Primary Voltage Ratings of Transformers</th></tr>
<tr><th>Nominal System Voltage(V)[2]</th><th>Primary Voltage Rating(V)[3]</th><th>Secondary Voltage Rating(V)</th></tr>
<tr><td>7620/ 13200</td><td>7620/ 13200</td><td>120/240</td></tr>
</table>

• The transformer shall be provided with a no-load tap changer to provide Two (2) - 2 ½ % tap above and Two (2) - 2½ taps below rated primary voltage. Tap 3 shall be the nominal tap. All tap ratings shall be at rated capacity.
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<td>
<u>Frequency</u>

The transformer shall be designed to operate at 60Hz.
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<td>
<u>KVA Ratings</u>

The kVA rating shall be continuous and based on not exceeding either a 65°C average winding temperature rise or an 80°C hottest-spot temperature rise above an ambient of 30°C. The temperature rise of the insulating oil shall not exceed 65°C when measured near the top of the tank.
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<td>
<u>Insulation Level</u>

The transformer shall be designed to have coordinated insulation levels at its terminals not less than values specified in the Table below.

<table>
<tr><th colspan="3">Transformer Dielectric Insulation Levels</th></tr>
<tr><th>Insulation Level</th><th>7620/ 13200 V</th><th>120/240 V</th></tr>
<tr><td>Full Wave (BIL) in kV, crest</td><td>95</td><td>30</td></tr>
<tr><td>Chopped Wave in kV, crest</td><td>105</td><td>33</td></tr>
</table>
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</table>

		Min. time to Flashover in us	1.8	1.0		
		Applied Voltage Test (kV rms)	-	10		
		Induced Voltage Test (phase to ground) (kV rms)	17	1.4		
	Percent Impedance • Transformers shall have impedance values as specified in Table 4. Conformance shall be verified thru test reports to be submitted by the manufacturer. • Difference in impedance between transformers of the same rating, when two or more units are produced by one manufacturer at the same time, shall not exceed 7.5% of the specified value.					
	Losses • Transformer losses shall be based on reference temperatures of 30°C for No-Load Losses and 85°C for Load Losses. • The No-Load Losses and Load Losses of the transformer unit shall not exceed the values specified in Table below.					

Standard Primary Voltage Ratings of Transformers

kVA Range	% Impedance	% Tolerance
3 thru 50	2.0	±10%

Transformer Maximum Losses

Rated Capacity (KVA)	Silicon Steel Core		Total Losses	
	No-Load Losses (w)	Load Losses (w)	(Watts)	(% of Rated kVA)
15	50	195	245	1.63
25	80	290	370	1.48
37.5	105	360	465	1.24
50	135	500	635	1.27

<table>
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- Actual transformer losses shall not exceed the values guaranteed in the bid by the manufacturer by 10% for No-Load Losses and 6% for Total Losses.

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Short Circuit Characteristics

The transformer shall withstand the mechanical and thermal stresses produced by external short-circuit currents specified in IEEE Std C57.12.00, latest revision.

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Loading Capability

The transformer shall be guaranteed to have the loading capability in accordance with ANSI/IEEE Std C57.92, latest revision.

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Audible Sound Level

Transformers shall be designed so that the average sound level does not exceed the values specified in the Table below.

<table>
<tr><th colspan="2">Transformer Audible Sound Level Limit</th></tr>
<tr><th>kVA Range</th><th>Average Sound Level (Decibels)</th></tr>
<tr><td>50 and below</td><td>48</td></tr>
</table>

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<tr><td>Construction</td><td>

Cooling Class

The cooling method employed for transformers supplied under this specification shall be self-cooled (OA or ONAN).

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Core-Coil Assembly

- Transformer core shall be manufactured using either low-loss high-permeability grain-oriented silicon steel.
- Transformer Windings shall be of high-conductivity Copper or Aluminum [(Cu-Cu) or (Cu-Al)].
- The core and coil assembly shall be mounted rigidly in the tank. The assembly shall not shill in direction during shipping, handling, installation, or during normal operation due to vibrations.
- The core and coil assembly shall be vacuum processed to ensure maximum penetration of the insulating liquid to the coil insulation system.

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</table>

Primary Bushings

- The transformer shall be furnished at the primary side with optional cover-mounted high-voltage bushing. The number and characteristics of bushing/s are shown in Table below.

Transformer Primary Bushing Number and Characteristics	
High-Voltage Bushing Number and Characteristics	**Transformer Primary Voltage Rating**
	7620/ 13200 V
Number	2
Voltage Class (kV)	15
BIL Withstand (kV, min.)	95
60 Hz Withstand, 1-min dry (kV, min.)	35
60 Hz Withstand, 10-s dry (kV, min.)	30
Minimum Creepage Distance, mm (in)	255(10)

- The high-voltage bushings shall be made from high-grade, wet- process porcelain with the entire exposed surface to be glazed. The color of the bushings shall be Light Gray ANSI 70, Munsell Notation 5BG 7.0/0.4.

- The high-voltage bushing/s shall be designated as HI (for single bushing transformer) or H1 & H2 (for double bushing transformer) and shall be arranged in accordance with the latest revision of IEEE Std C57.12.20.

- For double-bushing transformers, the HI and H2 end shall be designated as the high voltage primary winding, 1.2kV class, 30kV BIL, made from high grade, glazed, wet-process porcelain, colored Light Gray ANSI 70.

Secondary Bushings

- The transformer shall be furnished at the secondary side with sidewall-mounted, low-voltage bushings. The number and characteristics of the low-voltage bushings are shown in the Table below.

Transformer Secondary Bushing Number and Characteristics	
Low-Voltage Bushing Number and Characteristics	**Transformer Secondary Voltage Rating**
	120/240 V
Number	3
Voltage Class (kV)	1.2
BIL Withstand (kV, min.)	30
60 Hz Withstand, 1-min dry (kV, min.)	10
60 Hz Withstand, 10-s dry (kV, min.)	6

- The low-voltage bushings shall be made from high-grade, wet- process porcelain with the entire exposed surface to be glazed. The color of the bushings shall be Light Gray ANSI 70, Munsell Notation 5BG 7.0/0.4.

- The low-voltage-bushings shall be designated as Xl, X2 and X3 depending on the transformer secondary voltage rating, and shall be arranged in accordance with the latest revision of IEEE Std C57.12.20.

Bushing Terminals

- The high-voltage bushing and high-voltage neutral bushing shall be equipped with eyebolt-type connectors made from tinned copper alloy material and provided with stainless steel spring washers. The terminal connectors shall accommodate 8 mm2 (AWG No. 8) solid to 30 mm^2 (AWG No. 2) stranded copper conductor. Terminal detail shall be in accordance with the latest revision of IEEE Std C57.12.20.

- The low-voltage bushings shall be equipped with tinned copper alloy, eyebolt-type connectors or tinned spade terminal pads, arranged for vertical takeoff of cables. Size of terminal openings and cables, and type of spade terminal pads are shown in Table below.

Size of Low-Voltage Terminals and Conductor Range		
Size of Terminal Opening mm(in)	**Size of Conductor that the Terminal Will Accommodate mm² (AWG/kcmil)**	**kVA Range for Low-Voltage Rating of:**
		240 V
15.9 (5/8)	14 mm2 (AWG No. 6) solid to 100 mm² (AWG No. 4/0) stranded copper conductor	15& below
20.6 (13/16)	30 mm2 (AWG No. 2) solid to 700 mm² (350 kcmil) stranded copper conductor	25-50

- Terminal details shall be in accordance with IEEE Std C57.12.20, latest revision.
- Terminal markings shall be in accordance with IEEE Std C57.12.70, latest revision.

Polarity

Transformers supplied under this specification shall have the polarity specified in Table below.

Transformer Polarity	
KVA Range	**Transformer Primary Voltage Rating Primary 7620/ 13200 V**
167 kVA and below	Additive

	Tank • The transformer tank shall be made of steel. It shall be of sealed type construction with a steel cover. The tank cover shall be provided with a reusable gasket. The tank cover shall be grounded to the tank body using a copper strap adequately sized for the short-circuit rating of the transformer. • The tank shall be provided with a tank grounding connector located near the base of the tank. The connector shall be eyebolt-type, made from tinned copper alloy material, and designed to accommodate 8 mm^2 (AWG No. 8) to 30 mm^2 (AWG No. 2) stranded copper conductors. • Standard support lugs shall be provided on-the tank wall for securely mounting the transformer on the pole. The type of support lug to be provided corresponding to the transformer size shall be as shown in IEEE Std C57.12.20, latest revision. • Lifting lugs shall be permanently attached near the top of the transformer tank to allow for a balanced vertical lift. The design of the lifting lugs shall incorporate a safety factor of 5. • Lifting facilities for the core-coil assembly shall be provided. • The tank should have surge arrester mounting for LA adjacent to the high-voltage bushing. It shall consist of two steel pads with a 1/2 inch-13 NC tapped holes 11 mm (0.44 in) deep and located on the side of the tank in line vertically with the high voltage bushing. The arrester mounting provisions shall have centerline-to-centerline spacing as shown in IEEE Std C57.12.20, latest revision. Corrosion-resistant flanged cup shall be installed to protect the threaded opening of the unused arrester mounting pads. • The correct oil level at 25 °C shall be marked inside the tank. • The tank shall be painted with two (2) coats of outdoor type, light gray paint conforming to Munsell Notation 5BG7.0/0.4, AN SI70 Gray, over a suitable prime coat.		

	Tank Markings • Transformer kVA rating shall be painted in black using 3-inch block letters and numerals. The location of the kVA marking shall be below the low-voltage bushings.		
	Tap Changer • The transformer shall be provided with a tap changer designed for de-energized operation only. The tap changer shall be provided with an external operating handle mounted on the tank wall that can be rotated in a clockwise direction from a high tap voltage to low tap voltage. It shall be provided with stops when rotating from the highest to the lowest tap positions and shall be designed to prevent accidental operation by requiring a preliminary step before the tap setting can be changed. A caution: "DO NOT OPERATE WHEN ENERGIZED" shall be marked near the tap changer operating handle, clearly visible to the operator. • Tap positions are painted and caution markings are marked with reflectorized, non-weathering decals at least 25 mm (1.0 inch) high. The numeral "1" shall be assigned to the highest tap.		
	Pressure Relief Valve • The transformer shall be provided with a pressure relief valve located on the tank above the expected 140 °C top-oil level to be determined by the manufacturer. • The pressure relief valve shall be provided with a pull ring which when pulled using a standard hot-stick, will vent out pressure to atmospheric level. It shall be capable of withstanding a static pull force of 11.34 kg (25 pounds) for one minute without permanent deformation. • The venting port on the outward side of the valve-head scat shall be protected from entry of dust, moisture, and insects before and after any valve operation. An indicating device shall he provided to warn an observer on the ground that the pressure relief valve has operated. • The venting and sealing characteristic of the valve shall be as follows: a) Venting pressure: 69 kPa (10 psig) ± 13 kPa (gauge) (2 psig); b) Resealing pressure: 42 kPa (gauge) (6 psig) minimum; c) Zero leakage from reseal pressure to minus 56 kPa (gauge) (8 psig)		

	d) Flow at 103 kPa (gauge) (15 psig) = 16.5 L/s (35 SCFM) minimum, corrected for air pressure of 101 kPa (14.7 psi) (absolute) and air temperature of 21°C.		
	Enclosure Integrity • The completely assembled transformer enclosure shall be of sufficient strength to withstand an internal pressure of 49 kPa (gauge) (7 psig) without permanent distortion to the enclosure. • The enclosure shall also be of sufficient strength to withstand an internal pressure of 138 kPa (gauge) (20 psig) without rupturing or displacing components (excluding the cover gasket and gasket oil leaks) of the transformer.		
	Insulating Liquid The transformer shall be filled with unused mineral oil meeting the requirements of the latest revision of ASTM D3487 (Specification for Mineral Insulating Oil Used in Electrical Apparatus).		
	Hardware All energized hardware, i.e., bolts, nuts and washers, shall be made of tinned copper alloy material such as silicon bronze or equivalent. All other hardware shall be hot-dip galvanized.		
	Nameplate • The transformer shall be provided with a nameplate in accordance with the latest revision of IEEE Std C57.12.00. The nameplate shall be made of stainless steel with the technical information etched on the surface and coated with black enamel. • The following minimum information shall appear on the nameplate: a) Serial number; b) Class; c) Number of phases; d) Frequency e) Voltage rating f) kVA rating g) Temperature rise, °C		

	h) Polarity; i) Percent Impedance; j) BIL; k) Total weight, kg; l) Connection diagram; m) Name of manufacturer; n) Installation and operating instructions reference; o) The word "Transformer"; p) Type of insulating liquid (generic); q) Conductor material for each winding; r) Equipment identification number.		
Tests	*Routine Tests* Each transformer shall be subjected to the following routine production tests in accordance with procedures specified in IEEE Std C57.12.00 and IEEE Std C57.12.90, latest revisions: a) Winding resistance measurement tests; b) Ratio Test; c) Polarity test and Phase Relation; d) No-Load Losses and Excitation Current at rated voltage and frequency; e) Impedance voltage and Load loss measurement; f) Induced Potential Test (Low-Frequency Dielectric Test) g) Mechanical (Leak Test) The manufacturer shall conduct the Routine and Design Tests to verify that the Distribution Transformers comply with the requirements of this standard. The Member ECs reserve the right to witness the Routine and Design Tests. and the Supplier shall notify the Member ECs **fifteen (15) days** before each test is to be conducted. The Supplier is required to furnish the Member ECs with copies of all test reports.		

	Design Tests Copies of certified test reports from a reputable, internationally-accepted testing facility shall be submitted as proof of meeting the requirements in the following design tests: a) Temperature Rise; b) Lightning Impulse; c) Insulation Power Factor; d) Insulation Resistance;		

Detailed Technical Specifications for: *Items E to H (Transformer, Pole Type, Conventional, Amorphous, 15 kVA to 50 kVA, Cu-Cu-Al Winding)*			
Particulars	**Specifications Prescribed in Bidding Documents**	**Statement of Compliance**	**Details of Added Technical Specifications (if any)**
Scope	This Technical Specification covers the single-phase, overhead-type, oil-immersed, self-cooled, amorphous core, brand new and PCB-Free distribution transformers under Items E to H, with primary voltage rating of 7620/13200 V, and secondary voltage rating of 240 V.		
Site and Service Conditions	Transformers conforming to this specification shall be suitable for operation at rated kVA in a tropical environment and under the following service conditions: • Maximum altitude above sea level - 1000 m • Maximum ambient temperature - 40° C • Average ambient temperature - 30° C		
Applicable Standards	All transformers furnished under this specification shall be designed, manufactured and tested to meet or exceed the requirements of the latest revision of the following IEEE, ANSI/IEEE, NEMA and ASTM Standards or equivalent IEC standards: • IEEE C57.12.00 Std - Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers • IEEE C57.12.20 Std - Requirements for Overhead-Type Distribution Transformers, 500 kVA and Smaller; High-voltage,		

<table>
<tr><td></td><td>13200 Volts and Below; Low-voltage, 7970/13800 Y Volts and Below

• IEEE Std C57.12.70 - Terminal Markings and Connections for Distribution and Power Transformers

• IEEE Std C57.12.90 - Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers and Guide for Short Circuit Testing of Distribution and Power Transformers

• ANSI/IEEE Std C57.92 - Guide for Loading Mineral-Oil-Immersed Power Transformers

• NEMA Standards Publication No. TR 1 - Transformers, Regulators and Reactors

• ASTM D3487 - Specifications for Mineral Insulating Oil Used in Electrical Apparatus</td><td></td><td></td></tr>
<tr><td>Environmental Compliance</td><td>PCB Free</td><td></td><td></td></tr>
<tr><td>Electrical Characteristics</td><td><u>Voltage and Rating Taps</u>

• The transformer primary voltage rating shall be specified based on the rating shown in the Table below:

<table><tr><th colspan="3">Standard Primary Voltage Ratings of Transformers</th></tr><tr><th>Nominal System Voltage(V)[2]</th><th>Primary Voltage Rating(V)[3]</th><th>Secondary Voltage Rating(V)</th></tr><tr><td>7620/ 13200</td><td>7620/ 13200</td><td>240</td></tr></table>
• The transformer shall have a no-load tap changer to provide one (1) - 2 ½ % tap above and three (3) - 2½ taps below the rated primary voltage. Tap 2 shall be set as the nominal tap for the secondary voltage. All tap ratings shall be at rated capacity.</td><td></td><td></td></tr>
</table>

Frequency

The transformer shall be designed to operate at 60Hz.

KVA Ratings

The kVA rating shall be continuous and based on not exceeding either a 65°C average winding temperature rise or an 80°C hottest-spot temperature rise above an ambient of 30°C. The temperature rise of the insulating oil shall not exceed 65°C when measured near the top of the tank.

Insulation Level

The transformer shall be designed to have coordinated insulation levels at its terminals not less than values specified in the Table below.

Transformer Dielectric Insulation Levels		
Insulation Level	**7620/ 13200 V**	**120/240 V**
Full Wave (BIL) in kV, crest	95	30
Chopped Wave in kV, crest	105	33
Min. time to Flashover in us	1.8	1.0
Applied Voltage Test (kV rms)	-	10
Induced Voltage Test (phase to ground) (kV rms)	17	1.4

Percent Impedance

- Transformers shall have impedance values as specified in the table below. Conformance shall be verified thru test reports to be submitted by the manufacturer.

Standard Primary Voltage Ratings of Transformers		
kVA Range	**% Impedance**	**% Tolerance**
3 thru 50	2.0	±10%

- Difference in impedance between transformers of the same rating, when two or more units are produced by one manufacturer at the same time, shall not exceed 7.5% of the specified value.

Losses

- Transformer losses shall be based on reference temperatures of 30°C for No-Load Losses and 85°C for Load Losses.
- The No-Load Losses and Load Losses of the transformer unit shall not exceed the values specified in Table below.

Transformer Maximum Losses				
kVA Rating	**No-Load Loss (w)**	**Load Loss (w)**	**Total Losses**	
			Watts	**% of rate kVA**
15	15	195	210	1.4
25	18	290	308	1.23
37.5	30	360	390	1.04
50	32	500	532	1.06

- Actual transformer losses shall not exceed the values guaranteed in the bid by the manufacturer by 10% for No-Load Losses and 6% for Total Losses.

Short Circuit Characteristics

The transformer shall withstand the mechanical and thermal stresses produced by external short-circuit currents specified in IEEE Std C57.12.00, latest revision.

Loading Capability

The transformer shall be guaranteed to have the loading capability in accordance with ANSI/IEEE Std C57.92, latest revision.

<table>
<tr>
<td></td>
<td><u>Audible Sound Level</u>

Transformers shall be designed so that the average sound level does not exceed the values specified in the Table below.
<table>
<tr><th colspan="2">Transformer Audible Sound Level Limit</th></tr>
<tr><th>kVA Range</th><th>Average Sound Level (Decibels)</th></tr>
<tr><td>50 and below</td><td>48</td></tr>
</table>
</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td><u>Cooling Class</u>

The cooling method employed for transformers supplied under this specification shall be self-cooled (OA or ONAN).</td>
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<td></td>
<td><u>Core-Coil Assembly</u>

• Transformer core shall be manufactured using either low-loss high-permeability grain-oriented amorphous metal core.

• Transformer Windings shall be of high-conductivity Copper or Aluminum [(Cu-Cu) or (Cu-Al)].

• The core and coil assembly shall be mounted rigidly in the tank. The assembly shall not shill in direction during shipping, handling, installation, or during normal operation due to vibrations.

• The core and coil assembly shall be vacuum processed to ensure maximum penetration of the insulating liquid to the coil insulation system.</td>
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Primary Bushings

- The transformer shall be furnished at the primary side with optional cover-mounted high-voltage bushing. The number and characteristics of bushing/s are shown in Table below.

Transformer Primary Bushing Number and Characteristics	
High-Voltage Bushing Number and Characteristics	**Transformer Primary Voltage Rating**
	7620/ 13200 V
Number	2
Voltage Class (kV)	15
BIL Withstand (kV, min.)	95
60 Hz Withstand, 1-min dry (kV, min.)	35
60 Hz Withstand, 10-s dry (kV, min.)	30
Minimum Creepage Distance, mm (in)	255(10)

- The high-voltage bushings shall be made from high-grade, wet- process porcelain with the entire exposed surface to be glazed. The color of the bushings shall be Light Gray ANSI 70, Munsell Notation 5BG 7.0/0.4.

- The high-voltage bushing/s shall be designated as HI (for single bushing transformer) or H1 & H2 (for double bushing transformer) and shall be arranged in accordance with the latest revision of IEEE Std C57.12.20.

- For double-bushing transformers, the HI and H2 end shall be designated as the high voltage primary winding, 1.2kV class, 30kV BIL, made from high grade, glazed, wet-process porcelain, colored Light Gray ANSI 70.

Secondary Bushings

- The transformer shall be furnished at the secondary side with sidewall-mounted, low-voltage bushings. The number and characteristics of the low-voltage bushings are shown in the Table below.

Transformer Secondary Bushing Number and Characteristics	
Low-Voltage Bushing Number and Characteristics	**Transformer Secondary Voltage Rating**
	240 V
Number	3
Voltage Class (kV)	1.2
BIL Withstand (kV, min.)	30
60 Hz Withstand, 1-min dry (kV, min.)	10
60 Hz Withstand, 10-s dry (kV, min.)	6

- The low-voltage bushings shall be made from high-grade, wet- process porcelain with the entire exposed surface to be glazed. The color of the bushings shall be Light Gray ANSI 70, Munsell Notation 5BG 7.0/0.4.

- The low-voltage-bushings shall be designated as Xl, X2 and X3 depending on the transformer secondary voltage rating, and shall be arranged in accordance with the latest revision of IEEE Std C57.12.20.

Bushing Terminals

- The high-voltage bushing and high-voltage neutral bushing shall be equipped with eyebolt-type connectors made from tinned copper-alloy material and provided with stainless steel spring washers. The terminal connectors shall accommodate 8 mm^2 (AWG No. 8) solid to 30 mm^2 (AWG No. 2) stranded copper conductor. Terminal detail shall be in accordance with the latest revision of IEEE Std C57.12.20.

- The low-voltage bushings shall be equipped with tinned copper alloy, eyebolt-type connectors or tinned spade terminal pads, arranged for vertical takeoff of cables. Size of terminal openings and cables, and type of spade terminal pads are shown in Table below.

Size of Low-Voltage Terminals and Conductor Range		
Size of Terminal Opening mm(in)	**Size of Conductor that the Terminal Will Accommodate mm² (AWG/kcmil)**	**kVA Range for Low-Voltage Rating of:**
		240 V
15.9 (5/8)	14 mm² (AWG No. 6) solid to 100 mm² (AWG No. 4/0) stranded copper conductor	15& below
20.6 (13/16)	30 mm² (AWG No. 2) solid to 700 mm² (350 kcmil) stranded copper conductor	25-50

- Terminal details shall be in accordance with IEEE Std C57.12.20, latest revision.
- Terminal markings shall be in accordance with IEEE Std C57.12.70, latest revision.

Polarity

Transformers supplied under this specification shall have the polarity specified in Table below.

Transformer Polarity	
KVA Range	**Transformer Primary Voltage Rating Primary 7620/ 13200 V**
167 kVA and below	Additive

Tank

- The transformer tank shall be made of steel. It shall be of sealed-type construction with a steel cover. The tank cover shall be provided with a reusable gasket. The

	tank cover shall be grounded to the tank body using a copper strap adequately sized for the short-circuit rating of the transformer. • The tank shall be provided with a tank grounding connector located near the base of the tank. The connector shall be eyebolt-type, made from tinned copper alloy material, and designed to accommodate 8 mm^2 (AWG No. 8) to 30 mm^2 (AWG No. 2) stranded copper conductors. • Standard support lugs shall be provided on-the tank wall for securely mounting the transformer on the pole. The type of support lug to be provided corresponding to the transformer size shall be as shown in IEEE Std C57.12.20, latest revision. • Lifting lugs shall be permanently attached near the top of the transformer tank to allow for a balanced vertical lift. The design of the lifting lugs shall incorporate a safety factor of 5. • Lifting facilities for the core-coil assembly shall be provided. • The tank should have surge arrester mounting for LA adjacent to the high-voltage bushing. It shall consist of two steel pads with a 1/2 inch-13 NC tapped holes 11 mm (0.44 in) deep and located on the side of the tank in line vertically with the high voltage bushing. The arrester mounting provisions shall have centerline-to-centerline spacing as shown in IEEE Std C57.12.20, latest revision. Corrosion-resistant flanged cup shall be installed to protect the threaded opening of the unused arrester mounting pads. • The correct oil level at 25 °C shall be marked inside the tank. • The tank shall be painted with two (2) coats of outdoor type, light gray paint conforming to Munsell Notation 5BG7.0/0.4, ANSI70 Gray, over a suitable prime coat.		
	Tank Markings • Transformer kVA rating shall be painted in black using 3-inch block letters and numerals. The location of the kVA marking shall be below the low-voltage bushings.		

	Tap Changer • The transformer shall be provided with a tap changer designed for de-energized operation only. The tap changer shall be provided with an external operating handle mounted on the tank wall that can be rotated in a clockwise direction from a high tap voltage to low tap voltage. It shall be provided with stops when rotating from the highest to the lowest tap positions and shall be designed to prevent accidental operation by requiring a preliminary step before the tap setting can be changed. A caution: "DO NOT OPERATE WHEN ENERGIZED" shall be marked near the tap changer operating handle, clearly visible to the operator. • Tap positions are painted and caution markings are marked with reflectorized, non-weathering decals at least 25 mm (1.0 inch) high. The numeral "1" shall be assigned to the highest tap.		
	Pressure Relief Valve • The transformer shall be provided with a pressure relief valve located on the tank above the expected 140 °C top-oil level to be determined by the manufacturer. • The pressure relief valve shall be provided with a pull ring which when pulled using a standard hot-stick, will vent out pressure to atmospheric level. It shall be capable of withstanding a static pull force of 11.34 kg (25 pounds) for one minute without permanent deformation. • The venting port on the outward side of the valve-head scat shall be protected from entry of dust, moisture, and insects before and after any valve operation. An indicating device shall he provided to warn an observer on the ground that the pressure relief valve has operated. • The venting and sealing characteristic of the valve shall be as follows: a) Venting pressure: 69 kPa (10 psig) ± 13 kPa (gauge) (2 psig); b) Resealing pressure: 42 kPa (gauge) (6 psig) minimum; c) Zero leakage from reseal pressure to minus 56 kPa (gauge) (8 psig) d) Flow at 103 kPa (gauge) (15 psig) = 16.5 L/s (35 SCFM) minimum, corrected for air pressure of 101 kPa (14.7 psi) (absolute) and air temperature of 21°C.		

	Enclosure Integrity • The completely assembled transformer enclosure shall be of sufficient strength to withstand an internal pressure of 49 kPa (gauge) (7 psig) without permanent distortion to the enclosure. • The enclosure shall also be of sufficient strength to withstand an internal pressure of 138 kPa (gauge) (20 psig) without rupturing or displacing components (excluding the cover gasket and gasket oil leaks) of the transformer.		
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	Hardware All energized hardware, i.e., bolts, nuts and washers, shall be made of tinned copper alloy material such as silicon bronze or equivalent. All other hardware shall be hot-dip galvanized.		
	Nameplate • The transformer shall be provided with a nameplate in accordance with the latest revision of IEEE Std C57.12.00. The nameplate shall be made of stainless steel with the technical information etched on the surface and coated with black enamel. • The following minimum information shall appear on the nameplate: a) Serial number; b) Class; c) Number of phases; d) Frequency e) Voltage rating f) kVA rating g) Temperature rise, °C h) Polarity; i) Percent Impedance;		

	j) BIL; k) Total weight, kg; l) Connection diagram; m) Name of manufacturer; n) Installation and operating instructions reference; o) The word "Transformer"; p) Type of insulating liquid (generic); q) Conductor material for each winding; r) Equipment identification number.		
Tests	*Routine Tests* Each transformer shall be subjected to the following routine production tests in accordance with procedures specified in IEEE Std C57.12.00 and IEEE Std C57.12.90, latest revisions: a) Winding resistance measurement tests; b) Ratio Test; c) Polarity test and Phase Relation; d) No-Load Losses and Excitation Current at rated voltage and frequency; e) Impedance voltage and Load loss measurement; f) Induced Potential Test (Low-Frequency Dielectric Test) g) Mechanical (Leak Test) The manufacturer shall conduct the Routine and Design Tests to verify that the Distribution Transformers comply with the requirements of this standard. The Member ECs reserve the right to witness the Routine and Design Tests. and the Supplier shall notify the Member ECs **fifteen (15) days** before each test is to be conducted. The Supplier is required to furnish the Member ECs with copies of all test reports.		
	Design Tests Copies of certified test reports from a reputable, internationally-accepted testing facility shall be submitted as proof of meeting the requirements in the following design tests: a) Temperature Rise; b) Lightning Impulse; c) Insulation Power Factor; d) Insulation Resistance.		

Annex D

Company Name:

[Name of Bidder]

Authorized Representative:

[Name and Signature of Authorized Representative]

Contact Details:

Revised Table for the Form and Amount of Bid Securities

Form of Security	Amount
Cash, Cashier's check, Manager's check, issued by a Universal or Commercial Bank.	**2%** of the Member EC's respective share in the Total ABC as provided for under IB Clause 2.3
Bank draft/ Guarantee or irrevocable letter of credit issued by a universal or commercial bank. Provided, however, that it shall be confirmed or authenticated by a Universal or Commercial Bank, if issued by a foreign bank.	**2%** of the Member EC's respective share in the Total ABC as provided for under IB Clause 2.3
Surety Bond, callable upon demand issued by a surety or insurance company duly certified by the Insurance Commission as authorized to issue such security.	**5%** of the Member EC's respective share in the Total ABC as provided for under IB Clause 2.3