Office of the Executive Engineer (E)
IPDS Division
Room No. 1804 "A", 18th Floor,
New Delhi Municipal Council
Palika Kendra, New Delhi: 110001
Office Tel.:- 011-23340588

CORRIGENDUM

Sub:- Strengthening of Sub Transmission and Distribution Network Under Integrated Power Development Scheme (IPDS) Of Ministry Of Power, Government Of India.

Tender ID:- 2017_NDMC_122688_1

Ref:- Pre-bid meeting held on dated 14/02/2017 in the Council room, Palika Kendra, New Delhi.

S. No.	Bid document Clause	Amendment
1	**Volume-I section I at page 2 clause 9.1.** Bids must be delivered in single sealed envelopes to the address below at or before 1530 hours (IST) on 28.02.2017. Price breakup shall be submitted electronically. Late bids will be rejected. Bid Envelope i.e. Techno Commercial Part shall be opened on the same day i.e. 28.02.2017 in the presence of the bidders representatives who choose to attend in person at the address below at 16:00(IST). Price Bids shall be opened in the presence of the bidders representatives who choose to attend at the time and date at the address given in the intimation for opening of price bids in accordance with clause 25 of ITB.	Bids must be delivered in single sealed envelopes to the address below at or before 1530 hours (IST) on **23.03.2017**. Price breakup shall be submitted electronically. Late bids will be rejected. Bid Envelope i.e. Techno Commercial Part shall be opened on the same day i.e. **23.03.2017** in the presence of the bidders representatives who choose to attend in person at the address below at 16:00(IST). Price Bids shall be opened in the presence of the bidders representatives who choose to attend at the time and date at the address given in the intimation for opening of price bids in accordance with clause 25 of ITB.
2	**Volume-I section VII at page 2 clause 1.0 (1st Para & 6th Para from the top of page).** 4 Star rated (as per Bureau of Energy Efficiency (BEE)), distribution transformers are standardized in the project. Star level: Each Distribution Transformers must contain 4 star Level with Style and information provided by the Bureau of Energy Efficiency (B.E.E.), Ministry of Power, Government of India.	**Stands Deleted**
3	**Volume-I: Annexure –A of section III at page 4.** **1.0 Pre-qualification criteria Part A:** **1.01 Technical** **(I) Part I: Supply, Erection, Testing and commissioning, New/Augmentation of existing 11/0.415KV Distribution Transformer substation.** i. The Bidder must…… (i.e. Sum of KVA rating of distribution	**Volume-I: Annexure –A of section III at page 4.** **1.0 Pre-qualification criteria Part A:** **1.01 Technical** **(I) Part I: Supply, Erection, Testing and commissioning, New/Augmentation of existing 11/0.415KV Distribution Transformer substation.** i. The Bidder must…… (i.e. Sum of KVA rating of distribution transformers proposed in the present

<table>
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<td>transformers proposed in the present bid).....
<u>Or</u>
ii. The bidder must .....
<u>Or</u>
iii. The bidder must .....</td>
<td>bid i.e. 319800KVA)
<u>Or</u>
ii. The bidder must .....
<u>Or</u>
iii. The bidder must .....</td>
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<td>4</td>
<td><u>Volume-IV: Section-I: Detail of Substation.</u>

<table>
<tr><td></td><td>Part-1 System Strengthening work for North Division</td><td>Name of Electric Substation</td></tr>
<tr><td></td><td></td><td>92</td></tr>
<tr><td>S. No.</td><td>Description of Items</td><td>IAC</td></tr>
<tr><td>1</td><td>SITC of 11/0.415 KV voltage level, oil type distribution transformer having energy efficiency of level 2 according to IS-1180 (Part 1) and as per Technical specification at annexure –TS-I including refurnishing of Plinth of following rating</td><td></td></tr>
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<td><u>Volume-I section IV at page 44 clause 20B.</u>

Electrical Inspector inspection:

After successful completion of the work permission from State Electrical Inspectorate is required. Necessary fee etc. shall be paid by the Employer.

However if Contractor pays such fee it shall be reimbursed on actual basis on documentary evidence.

Defects / in-complete works notified by Electrical Inspectorate shall be completed by the agency at no extra cost implication to Employer.</td>
<td>Stands deleted.</td>
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6	**Volume-II section I at page3 clause 2.1.1** Vendor approval: All the materials procured for IPDS works shall be purchased from the authorized vendors approved by their Quality Assurance Department of PIA. Approved vendors list is to be uploaded periodically (monthly) on the PIA web portal. New vendors/suppliers may be approved by PIAs, provided capability of manufacturer's is assessed suitably by visiting the factory premises and checking the testing facility available before accepting it as approved vendor. If required, State Electricity Board/Power Department/ Distribution Companies may adopt vendors already approved by CPSUs.	**Stands deleted.**
7	**Volume-I section VI at page 31-32** The sequence is a,b,c,d,e,o,p.	The Sequence is:- a,b,c,d,e,f,g.
8	**Volume-I: Section II at page 12, Para no. 6 from top of the page.** Requisite Sales Tax Declaration forms for all the equipments/items to be supplied from within India shall be furnished by the Employer	**Stands Deleted**
9	**Volume-III: at page 166 Clause No 14.3.** The outer sheath shall have the following information embossed or indented on it; ISI marking, the manufacturer's name or trade mark, the voltage grade, the year of manufacture and the letters "DDUGJY, Name of Employer" The identification shall repeat every 300/350mm along the length of the cable. Outer sheath of cable shall be black in permanent colour.	The outer sheath shall have the following information embossed or printed on it; ISI marking, the manufacturer's name or trade mark, the voltage grade, the year of manufacture and the letters "NDMC", Name of Employer" The identification shall repeat every 1meter along the length of the cable. Outer sheath of cable shall be black in permanent colour.
10	**Volume-I: section V at page 4.** **(New clause)**	**(New clause) 13 (xvii)** Extra/Substituted Items (i) Extra items of work are items that are completely new, and are in additional to the items contained in the contract & Substituted items are items that are taken up with partial modification or in lieu of items of work in the contract. One agreement item can be substituted by multiple items. A) For Project & Original Work In the case of extra items (s) the contractor may be within fifteen days of receipt of order of occurrence of the item(s) claim rates, supported by proper analysis, for the work and Engineer-in-Charge shall within one month of the receipt of the claim supported by analysis after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

		B) Deviation, Substituted Items, Pricing In the case of substitute items, the rate for the agreement items (to be substituted) and substituted item shall also be determined in the manner as follows; (a) If the market rate for the substituted item so determined is more than the market rate of the agreement item (to be substituted) the rate payable the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates for substituted item and the agreement item (to be substituted). (b) If the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted) the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).
11	**Volume-I: annexure –A of section III at page 6.** The sequence is 1.02.1,1.02.2,1.02.3,1.02.4,1.02.5 & 1.02.6	The sequence is:- 1.02.4,1.02.5,1.02.6,1.02.7,1.02.8 and 1.02.9.
12	**The fifth row of table 3.2 in volume-III: at page 3.** IS-335 Specification for Transformer/Mineral Oil IEC Pub 296	Specification for transformer oil/mineral oil- IS-335 shall be applicable and **IEC 296 shall optional.**
13	**Volume-III: at page 6 clause 6.1.2.6.** Transformer manufacturer should have in house core cutting facility for distribution transformer.	The prime CRGO core cutting by a sub vendor of transformer manufacturer shall be allowed.
	Volume-III: at page 35 **Annexure – A** Check-list for Inspection of Prime quality CRGO for Transformers During inspection of PRIME CRGO, the following points needs to be checked by the Transformer manufacturer. The manufacturer should have in-house core cutting facility. Utilitity's inspector shall verify all these points during inspection:- 1. **PRIME CRGO cutting is at works of Transformer Manufacturer:** Review of documents: Purchase Order (unpriced) to PRIME CRGO supplier/Authorised Agency Manufacturer's test certificate Invoice of the Supplier Packing List Bill of Lading Bill of Entry Certificate by Customs Deptt.	**Annexure - A** Check-list for Inspection of Prime quality CRGO for Transformers During inspection of PRIME CRGO, the following points needs to be checked by the Transformer manufacturer. Utilitity's inspector shall verify all these points during inspection:- 1. In case PRIME CRGO cutting is at works of Transformer Manufacturer: Review of documents: Purchase Order (unpriced) to PRIME CRGO supplier/Authorised Agency Manufacturer's test certificate Invoice of the Supplier Packing List Bill of Lading Bill of Entry Certificate by Customs Deptt.

	Reconciliation Statement as per format below Certificate of Origin BIS Certification **Format for Reconciliation/Traceability records** Packing List No./date /Quantity of PRIME CRGO received Name of Manufacturer Manufacturer test certificate No./date s. no | Details of package/job | Drawing Reference | Quantity Involved | Cumulative Quantity Consumed | Balance stock 2.1 Inspection of PRIME CRGO Coils: PRIME CRGO-Manufacturer's Identification Slip on PRIME CRGO Coils **Visual Inspection of PRIME CRGO Coils offered as per packing list (for verification of coil details as per Test certificate & healthiness of packaging).** **Unique numbering inside of each sample of PRIME CRGO coil and verification of records to be maintained in the register for consumption of CRGO coil.** **ISI logo sticker on packed mother coil and ISI logo in Material TC.** 2.2. During inspection of PRIME CRGO, surveillance testing of sample shall be carried out for Stacking Factor, Permeability, Specific watt loss at 1.5 Tesla and/or 1.7 Tesla depending on the grade of PRIME CRGO and aging test etc. applicable as per relevant IS/ IEC standard, Tech. Spec., MQP and Transformer manufacturer plant standard. **Inspection Clearance Report would be issued after this inspection** 3 Inspection of PRIME CRGO laminations: Transformer manufacturer will maintain records for traceability of laminations to prime CRGO coils and burr/bow on laminations shall be measured. Utility can review these records on surveillance basis. 4. Inspection at the time of core building: Visual Inspection of PRIME CRGO laminations. In case of suspected mix-up/ rusting/decoloration, samples may be taken for testing on surveillance basis for tests mentioned in A.2.2 above. Above tests shall be witnessed by Utility. In case testing facilities are not available at Manufacturer's work, the sample(s) sealed by Utility to be sent to approved labs for testing. **Inspection Clearance Report would be issued after this inspection** **NOTE :-** Transformer Manufacturer to ensure that PRIME CRGO is procured from POWERGRID approved vendors and CRGO manufacturer should have valid BIS Certificate for respective offered Grade. **a) General** If a surveillance sample is drawn and sent to TPL (if testing facility not	Reconciliation Statement as per format below Certificate of Origin BIS Certification **format for Reconciliation/Traceability records** Packing List No./date /Quantity of PRIME CRGO received Name of Manufacturer Manufacturer test certificate No./date s. no | Details of package/job | Drawing Reference | Quantity Involved | Cumulative Quantity Consumed | Balance stock 2.1 Inspection of PRIME CRGO Coils: PRIME CRGO-Manufacturer's Identification Slip on PRIME CRGO Coils **Visual Inspection of PRIME CRGO Coils offered as per packing list (for verification of coil details as per Test certificate & healthiness of packaging).** **Unique numbering inside of each sample of PRIME CRGO coil and verification of records to be maintained in the register for consumption of CRGO coil.** **ISI logo sticker on packed mother coil and ISI logo in Material TC.** 2.2. During inspection of PRIME CRGO, surveillance testing of sample shall be carried out for Stacking Factor, Permeability, Specific watt loss at 1.5 Tesla and/or 1.7 Tesla depending on the grade of PRIME CRGO and aging test etc. applicable as per relevant IS/ IEC standard, Tech. Spec., MQP and Transformer manufacturer plant standard. **Inspection Clearance Report would be issued after this inspection** 3 Inspection of PRIME CRGO laminations: Transformer manufacturer will maintain records for traceability of laminations to prime CRGO coils and burr/bow on laminations shall be measured. Utility can review these records on surveillance basis. 4 Inspection at the time of core building: Visual Inspection of PRIME CRGO laminations. In case of suspected mix-up/ rusting/decoloration, samples may be taken for testing on surveillance basis for tests mentioned in A.2.2 above. Above tests shall be witnessed by Utility. In case testing facilities are not available at Manufacturer's work, the sample(s) sealed by Utility to be sent to approved labs for testing. **Inspection Clearance Report would be issued after this inspection** (i) In case PRIME CRGO cutting is at Sub-vendor of Transformer Manufacturer: Review of documents: Purchase Order (unpriced) to PRIME CRGO supplier/ Authorised Agency

	available with the manufacturer), the Transformer manufacturer can continue manufacturing at their own risk and cost pending TPL test report on PRIME CRGO sample drawn. Decision for acceptance of PRIME CRGO shall be based upon report of the sample drawn. **These checks shall be read in-conjunction with approved Quality Plan, specification as a whole and conditions of contract.** **Sampling Plan (PRIME CRGO)** Distribution Transformers -1st transformer and subsequently at random 2% of Transformers (min. 1) offered for inspection. **NOTE:-** One sample for each lot of CRGO shall be drawn on surveillance basis. CRGO has to be procured only from POWERGRID approved vendors. List of such vendors is available at the following website. Since the list is dynamic in nature, the site may be checked from time to time to see the list of approved vendors.	Purchase Order (unpriced) to Core Cutter Manufacturer test certificate Invoice of the Supplier Packing List Bill of Lading Bill of Entry Certificate by Customs Deptt. Reconciliation Statement as per format below Certificate of origin BIS Certification Format for Traceability records as below:- Packing List No./date /Quantity of PRIME CRGO received Name of Manufacturer Manufacturer test certificate No./date 2.1 Inspection of PRIME CRGO Coils: PRIME CRGO-Manufacturer's Identification Slip on PRIME CRGO Coils **Visual Inspection of PRIME CRGO Coils offered as per packing list (for verification of coil details as per Test certificate & healthiness of packaging).** **Unique numbering inside of each sample of PRIME CRGO coil and verification of records to be maintained in the register for consumption of CRGO coil.** **ISI logo sticker on packed mother coil and ISI logo in Material TC.** 2.2. During inspection of PRIME CRGO, surveillance testing of sample shall be carried out for Stacking Factor, Permeability, Specific watt loss at 1.5 Tesla and/or 1.7 Tesla, thickness depending on the grade of PRIME CRGO and aging test etc. applicable as per relevant IS/ IEC standard, Tech. Spec., MQP and Transformer manufacturer plant standard. Inspection Clearance Report would be issued after this inspection 3 Inspection of PRIME CRGO laminations: Transformer manufacturer representative will inspect laminations and issue their internal Inspection Clearance Report. Inspection will comprise of review of traceability to prime CRGO coils, visual Inspection of PRIME CRGO laminations and record of burr/bow. After clearance given by transformer manufacturer, Utility will issue an Inspection Clearance Report after record review. If so desired by Utility, their representative may also join transformer manufacturer representative during this inspection. Inspection Clearance Report would be issued after this inspection 4.Inspection at the time of core building: Visual Inspection of PRIME CRGO laminations. In case of suspected mix-up/rusting/decoloration, samples may be taken for testing on surveillance basis for tests mentioned in B.2.2. Inspection Clearance Report would be issued after this inspection

		NOTE :- a) Transformer Manufacturer to ensure that PRIME CRGO is procured from POWERGRID approved vendors and CRGO manufacturer should have valid BIS Certificate for respective offered Grade. 14.1 Transformer Manufacturer should also involve themselves for ensuring the quality of CRGO laminations at their Core Cutter's works. They should visit the works of their Core cutter and carry out necessary checks. a) General If a surveillance sample is drawn and sent to TPL (if testing facility not available with the manufacturer), the Transformer manufacturer can continue manufacturing at their own risk and cost pending TPL test report on PRIME CRGO sample drawn. Decision for acceptance of PRIME CRGO shall be based upon report of the sample drawn. These checks shall be read in-conjunction with approved Quality Plan, specification as a whole and conditions of contract. Sampling Plan (PRIME CRGO) DTs and other ratings -1st transformer and subsequently at random 2% of Transformers (min. 1) offered for inspection. NOTE:-One sample for each lot of CRGO shall be drawn on surveillance basis. CRGO has to be procured only from POWERGRID approved vendors. List of such vendors is available at the following website. Since the list is dynamic in nature, the site may be checked from time to time to see the list of approved vendors. http://apps.powergridindia.com/ims/ComponentList/Power-former%20upto%20420%20kV-CM%20List.pdf
14	**Volume-III: at page 13 clause 22.1.** In case HV/LV terminations are to be made through cables the transformer shall be fitted with suitable cable box on 11 kV side to terminate one 11kV/ 3 core aluminium conductor cable up to 240 sq. mm. (Size as per requirement).	The transformer shall be fitted with suitable cable box on 11 kV side to terminate one 11kV/ 3 core aluminium conductor cable up to 240 sq. mm. (Size as per requirement).
15	**Volume-III: at page 13 clause 22.2.** The transformer shall be fitted with suitable LV cable box having non-magnetic material gland plate with appropriate sized single compression brass glands on LV side to terminate 1.1 kV/single core XLPE armoured cable at the bottom of LV cable box and provision shall be made to connect bus ducting at the top of LV cable box.	The transformer shall be fitted with suitable LV cable box and provision shall be made to connect bus ducting at the top of LV cable box.
16	**Volume-III: at page 15 clause 29.1.** All the equipment offered shall be fully type tested by the bidder or his collaborator as per the relevant standards including the additional type tests. The type test must have been conducted on a transformer of same design **during the last five years** at the time of bidding. The bidder shall furnish four sets of type test reports along with the offer. **In case, the offered transformer is not type tested,**	"All the equipment offered shall be fully type tested by the bidder or his collaborator/OEM as per the relevant standards including the additional type tests. The type test must have been conducted on a transformer of rating 1000 KVA and 1600 KVA. The voltage level of the transformer should be 11 KV/ 400 to 433 volt, during the last five years at the time of bidding. The bidder shall furnish four sets of type test reports along with the offer**. In case, the offered transformer is not type tested, the bidder will conduct the type test as per the relevant standards**

	the bidder will conduct the type test as per the relevant standards including the additional type tests at his own cost in CPRI (Bangalore)/ ERDA(Baroda) in the presence of employers representative(s) without any financial liability to employer in the event of order placed on him.	**including the additional type tests at his own cost in CPRI (Bangalore)/ERDA (Baroda) without any financial liability to employer in the event of order placed on him.**
17	**Volume-III: at page 18 clause 33.** **TESTS AT SITE**: The purchaser will conduct the following test on receipt of transformers in their store. The utility shall arrange all equipment, tools & tackle and manpower for the testing. The bidder will depute his representative to witness the same. All such test shall be conducted by utility not later than 10 days from receipt of transformers. i) Megger Test ii) Ratio test iii) Magnetization test iv) Oil test v) Core balancing test	**TESTS AT SITE**: The contractor will conduct the following tests at site of installation. The contractor shall arrange all equipments with valid calibration, tools & tackle and man power for the testing. The test shall be conducted in the presence of the representative of OEM of equipment and representative of employer to witness the same. (i) Megger Test. (ii) Ratio Test. (iii) Magnetization test. (iv) Oil test. (v) Core balancing test
18	**Volume-III: at page 19 clause 35.4.** After the main raw-material i.e. core and coil material and tanks are arranged and transformers are taken for production on shop floor and a few assembly have been completed, the firm shall intimate the purchaser in this regard, so that an officer for carrying out such inspection could be deputed, as far as possible within seven days from the date of intimation. During the stage inspection a few assembled core shall be dismantled to ensure that the laminations used are of good quality. Further, as and when the transformers are ready for despatch, an offer intimating about the readiness of transformers, for final inspection for carrying out tests as per relevant IS shall be sent by the firm along with Routine Test Certificates. The inspection shall normally be arranged by the purchaser at the earliest after receipt of offer for pre-delivery inspection. The proforma for pre delivery inspection of Distribution transformers is placed at **Annex- III**.	After the main raw-material i.e. core and coil material and tanks are arranged and transformers are taken for production on shop floor and a few assembly have been completed, the firm shall intimate the purchaser in this regard, so that an officer for carrying out such inspection could be deputed, as far as possible within seven days from the date of intimation. During the stage inspection a few assembled core shall be dismantled to ensure that the laminations used are of good quality. Further, as and when the transformers are ready for despatch, an offer intimating about the readiness of transformers, for final inspection for carrying out tests as per relevant IS shall be sent by the firm along with Routine Test Certificates. The inspection shall normally be arranged by the purchaser at the earliest after receipt of offer for pre-delivery inspection. The proforma for pre delivery inspection of Distribution transformers is placed at **Annex- II**.
19	**Volume-III: at page 20 clause 36.9.4** ISI marking on the transformer is mandatory. As per Quality Control Order for Electrical Transformers-2015, issued by Department of Heavy Industries, Government of India, the Standard / ISI marking on Distribution Transformers is mandatory and the product should be manufactured in compliance with IS 1180 Part-1: (2014).	ISI marking on the transformer is mandatory. As per Quality Control Order for Electrical Transformers- 2015, issued by Department of Heavy Industries, Government of India, the Standard / ISI marking on Distribution Transformers is mandatory and the product should be manufactured in compliance with IS 1180 Part-1: (2014). The bidder shall submit alongwith the bid a copy of valid BIS license issued by Bureau of Indian standard, authorizing original equipment manufacturer to manufacture transformers of energy efficiency level—II or higher as per IS-1180 (part-I)

20	**Volume-III: at page 21 clause 40.1** The bidder shall fill in the following schedule which will be part of the offer. If the schedule are not submitted duly filled in with the offer, the offer shall be liable for rejection. **Schedule-A : Guaranteed Technical Particulars** **Schedule-B : Schedule of Deviations**	The bidder shall fill in the following schedule which will be part of the offer. If the schedules are not submitted duly filled in with the offer, the offer shall be liable for rejection. **Schedule-A: Guaranteed Technical Particulars** (to be submitted by bidder in the form available at page 25-34) of volume-III.) **Schedule-B: Schedule of Deviations** (to be submitted along with bid in accordance with clause 41)
21	**Volume-III: at page 21 clause 42.1** Marshaling box with WTI shall be provided. For functioning of WTI, once CT (primary) at any Phase on LV side of current 1400A for 1000kVA transformer and 2300A for 1600kVA transformer shall beprovided. Secondary side of CT shall be compatible with WTI CT ratio. All the connections of WTI and Buccholz relay shall be terminated in marshaling box by providing cable connectors.	Marshalling box with **WTI/ OTI** shall be provided. For functioning of **WTI/OTI,** one CT (primary at any phase on LV side of current 1400 A for 1000 KVA transformer and 2300 A for 1600 KVA transformer shall be provided. Secondary side of CT shall be compatible with **WTI/ OTI** CT ratio. All the connections of **WTI/ OTI** and Buccholz relay/ shall be terminated in marshalling box by providing cable connections.
22	**Volume-III: at page 41** **(New clause) 7.1.2** **(New clause) 7.1.3**	(New clause) 7.1.2 The bidder should offer the core for inspection and approval by the purchaser during manufacturing stage. CRGO steel for core shall be purchased only from the approved vendors, list of which is available at http://apps.powergridindia.com/ims/ComponentList/Powerformer% 20upto%20420%20kV- M%20List.pdf. Please refer to "Check-list for Inspection of Prime quality CRGO for transformers" attached at Annexure-A. It is mandatory to follow the procedure given in this Annexure. The prime CRGO core cutting by a sub vendor of transformer manufacturer shall be allowed. Annexure - A Check-list for Inspection of Prime quality CRGO for Transformers During inspection of PRIME CRGO, the following points needs to be checked by the Transformer manufacturer. Utilitity's inspector shall verify all these points during inspection:- 1. In case PRIME CRGO cutting is at works of Transformer Manufacturer: Review of documents: Purchase Order (unpriced) to PRIME CRGO supplier/Authorised Agency Manufacturer's test certificate

Invoice of the Supplier

Packing List

Bill of Lading

Bill of Entry Certificate by Customs Deptt.

Reconciliation Statement as per format below

Certificate of Origin

BIS Certification

format for Reconciliation/Traceability records

Packing List No./date /Quantity of PRIME CRGO received

Name of Manufacturer

Manufacturer test certificate No./date

s. no	Details of package/job	Drawing Reference	Quantity Involved	Cumulative Quantity Consumed	Balance stock

2.1 Inspection of PRIME CRGO Coils:

PRIME CRGO-Manufacturer's Identification Slip on PRIME CRGO Coils

Visual Inspection of PRIME CRGO Coils offered as per packing list (for verification of coil details as per Test certificate & healthiness of packaging).

Unique numbering inside of each sample of PRIME CRGO coil and verification of records to be maintained in the register for consumption of CRGO coil.

ISI logo sticker on packed mother coil and ISI logo in Material TC.

2.2. During inspection of PRIME CRGO, surveillance testing of sample shall be carried out for Stacking Factor, Permeability, Specific watt loss at 1.5 Tesla and/or 1.7 Tesla depending on the grade of PRIME CRGO and aging test etc. applicable as per relevant IS/ IEC standard, Tech. Spec., MQP and Transformer manufacturer plant standard.

Inspection Clearance Report would be issued after this inspection

3 Inspection of PRIME CRGO laminations: Transformer manufacturer will maintain records for traceability of laminations to prime CRGO coils and burr/bow on laminations shall be measured. Utility can review these records on surveillance basis.

4. Inspection at the time of core building:

Visual Inspection of PRIME CRGO laminations. In case of suspected mix-up/ rusting/decoloration, samples may be taken for testing on surveillance basis for tests mentioned in A.2.2 above.

Above tests shall be witnessed by Utility. In case testing facilities are not available at Manufacturer's work, the sample(s) sealed by Utility to be sent to approved labs for testing.

		Inspection Clearance Report would be issued after this inspection (ii) In case PRIME CRGO cutting is at Sub-vendor of Transformer Manufacturer: Review of documents: Purchase Order (unpriced) to PRIME CRGO supplier / Authorised Agency Purchase Order (unpriced) to Core Cutter Manufacturer test certificate Invoice of the Supplier Packing List Bill of Lading Bill of Entry Certificate by Customs Deptt. Reconciliation Statement as per format below Certificate of origin BIS Certification Format for Traceability records as below:- Packing List No./date /Quantity of PRIME CRGO received Name of Manufacturer Manufacturer test certificate No./date 2.1 Inspection of PRIME CRGO Coils: PRIME CRGO-Manufacturer's Identification Slip on PRIME CRGO Coils Visual Inspection of PRIME CRGO Coils offered as per packing list (for verification of coil details as per Test certificate & healthiness of packaging). Unique numbering inside of each sample of PRIME CRGO coil and verification of records to be maintained in the register for consumption of CRGO coil. ISI logo sticker on packed mother coil and ISI logo in Material TC. 2.2. During inspection of PRIME CRGO, surveillance testing of sample shall be carried out for Stacking Factor, Permeability, Specific watt loss at 1.5 Tesla and/or 1.7 Tesla, thickness depending on the grade of PRIME CRGO and aging test etc. applicable as per relevant IS/ IEC standard, Tech. Spec., MQP and Transformer manufacturer plant standard. Inspection Clearance Report would be issued after this inspection 3 Inspection of PRIME CRGO laminations: Transformer manufacturer representative will inspect laminations and issue their internal Inspection Clearance Report. Inspection will comprise of review of traceability to prime CRGO coils, visual Inspection of PRIME CRGO laminations and record of burr/bow. After clearance given by transformer manufacturer, Utility will issue an Inspection Clearance Report after record review. If so desired by Utility, their representative may also join transformer manufacturer representative during this inspection. Inspection Clearance Report would be issued after this inspection 4.Inspection at the time of core building: Visual Inspection of PRIME CRGO laminations. In case of suspected mix-up/rusting/decoloration, samples may be taken for testing on surveillance

		basis for tests mentioned in B.2.2. Inspection Clearance Report would be issued after this inspection NOTE :- a) Transformer Manufacturer to ensure that PRIME CRGO is procured from POWERGRID approved vendors and CRGO manufacturer should have valid BIS Certificate for respective offered Grade. 14.2 Transformer Manufacturer should also involve themselves for ensuring the quality of CRGO laminations at their Core Cutter's works. They should visit the works of their Core cutter and carry out necessary checks. b) General If a surveillance sample is drawn and sent to TPL (if testing facility not available with the manufacturer), the Transformer manufacturer can continue manufacturing at their own risk and cost pending TPL test report on PRIME CRGO sample drawn. Decision for acceptance of PRIME CRGO shall be based upon report of the sample drawn. These checks shall be read in-conjunction with approved Quality Plan, specification as a whole and conditions of contract. Sampling Plan (PRIME CRGO) DTs and other ratings -1st transformer and subsequently at random 2% of Transformers (min. 1) offered for inspection. NOTE:-One sample for each lot of CRGO shall be drawn on surveillance basis. CRGO has to be procured only from POWERGRID approved vendors. List of such vendors is available at the following website. Since the list is dynamic in nature, the site may be checked from time to time to see the list of approved vendors. http://apps.powergridindia.com/ims/ComponentList/Power-former%20upto%20420%20kV-CM%20List.pdf
23	**volume-III: at page 41 clause** **7.2.1** Material: Super enamel 'H' - Class copper / Alum / Conductor / 'C'- Class (UL Approved RTI 220 Deg. C) / Copper conductor / Strip / Foil winding. The class of insulation of the conductor must be one class higher than the class of the transformer.	Material: super enamel 'H' Class copper conductor /C class (UL approved RTI 220 deg C)/ Copper conductor/ Strip winding. The class of insulation of the conductor must be one class higher than the class of transformer.
24	**volume-III: at page 41 clause** **(New clause) 7.7.8.3**	Manufacturer's standard practice shall also be acceptable For painting work.
25	**volume-III: at page 48 clause** **7.13.1** **Load Management Signal Light:** A signal light shall be provided to give information about the loading condition of the transformer. It shall forewarn any overloading problem at the installation such that a change out of the existing transformer with a higher capacity transformer can be planned.	**Stands Deleted**

	The signal light mechanism shall not reset itself when the load drops from the overloaded condition. The signal light shall remain lighted once the signal light contacts close due to overload and can be turned off by manual operation. (The signal light shall not give indication for momentary overloading).	
26	**volume-III: at page 48-49 clause 8.0 (a)** All the equipment offered shall be fully type tested by the bidder or his collaborator as per the relevant standards including the additional type tests mentioned at clause 6.2. The type test must have been conducted on a transformer of same design. The Bidder shall furnish four sets of type test reports along with the offer. Offers without type test reports will be treated as Non-responsive.	All the equipment offered shall be fully type tested by the bidder or his collaborator/OEM as per the relevant standards including the additional type tests. The type test must have been conducted on a transformer of rating 1000 KVA and 1600 KVA. The voltage level of the transformer should be 11 KV/ 400 to 433 volt during the last five years at the time of bidding. The bidder shall furnish four sets of type test reports along with the offer. In case, the offered transformer is not type tested, the bidder will conduct the type test as per the relevant standards including the additional type tests at his own cost in CPRI (Bangalore)/ERDA(Baroda) without any financial liability to employer in the event of order placed on him.
27	**volume-III: at page 50 clause 8.3** TESTS AT SITE: The purchaser reserves the right to conduct all tests on Transformer after arrival at site and the manufacturer shall guarantee test certificate figures under actual service conditions**.**	TESTS AT SITE: The contractor will conduct the following tests at site of installation. The contractor shall arrange all equipments with valid calibration, tools & tackle and manpower for the testing. The contractor will depute his representative as well as representative of OEM of equipments to witness the same:- i) Megger Test ii) Ratio test iii) Magnetization test iv) Core balancing test
28	**volume-III: at page 50-51 clause 8.2** **TYPE TESTS TO BE CONDUCTED ON ONE UNIT:** In addition to the Tests mentioned in para 6.1 following Tests shall be conducted	 **TYPE TESTS TO BE CONDUCTED ON ONE UNIT:** In addition to the Tests mentioned in para 8.1 following Tests shall be conducted
29	**volume-III: at page 50 clause 8.2 (1)** Temperature rise test for determining the maximum temperature rise as per IS-11171/1980 Cl. No.	Be read as under; Temperature rise test for determining the maximum temperature rise as per relevant IS/IEC

30	**volume-III: at page 53 clause** **(New clause)**	**13 CABLE BOXES:** Cable Boxes shall be provided on both HV & LV side. 13.1 The transformer shall be fitted with suitable cable box on 11 kV side to terminate one 11kV/ 3 core aluminium conductor cable up to 240 sq. mm. (Size as per requirement). The bidder shall ensure the arrangement of HT Cable box so as to prevent the ingress of moisture into the box due to rain water directly falling on the box. The cable box on HT side shall be of the split type with faces plain and machined and fitted with Neo-k-Tex or similar quality gasket and complete with brass wiping gland to be mounted on separate split type gland plate with nut-bolt arrangement and MS earthing clamp. The bushings of the cable box shall be fitted with nuts and stem to take the cable cores without bending them. The stem shall be of copper with copper nuts. The cross section of the connecting rods shall be stated and shall be adequate for carrying the rated currents. On the HV side the terminal rod shall have a diameter of not less than 12 mm. The material of connecting rod shall be copper. HT Cable support clamp should be provided to avoid tension due to cable weight. 13.2 The transformer shall be fitted with suitable cable box and provision shall be made to connect bus ducting at the top of LV cable box. 14 TERMINAL MARKINGS: 14.1 High voltage phase windings shall be marked both in the terminal boards inside the tank and on the outside with capital letter 1U, 1V, 1W and low voltage winding for the same phase marked by corresponding small letter 2U, 2V, 2W. The neutral point terminal shall be indicated by the letter 2N. Neutral terminal is to be brought out and connected to local grounding terminal by an earthing strip.
31	**volume-III: at page 63 clause 1.3.1** The switchgear shall be of CRCA steel construction with sheet not less than 3mm thickness for load bearing section and not less than 2 mm thickness for non-load bearing and shall totally dust and vermin proof. However, if vendor has standardized the thickness of enclosure other than above mentioned and it meets the performance requirements and the design has been established through type test, the same shall be accepted. The panels shall be rigid without using any external bracings. The switchboard panels should comply with relevant IS/IEC and revision thereof and shall be designed for easy operation maintenance and further extension. Bus bar, metering circuit breaker chamber, cables and cable box chamber should have proper access for maintenance, proper interlocks should be	The switchgear shall be of CRCA steel/ALU ZINC construction with sheet not less than 3mm thickness for load bearing section and not less than 2 mm thickness for non-load bearing and shall totally dust and vermin proof. However, if vendor has standardized the thickness of enclosure other than above mentioned and it meets the performance requirements and the design has been established through type test, the same shall be accepted. The panels shall be rigid without using any external bracings. The switchboard panels should comply with relevant IS/IEC and revision thereof and shall be designed for easy operation maintenance and further extension. Bus bar, metering circuit breaker chamber, cables and cable box chamber should have proper access for maintenance, proper interlocks should be provided. All instruments shall be non-draw out type and safe guard in every respect from

	provided. All instruments shall be non-draw out type and safe guard in every respect from damages and provided with mechanical indicator of connection and disconnection position. The switchgear shall be completed with all necessary wiring fuses, auxiliary contacts terminal boards etc	damages and provided with mechanical indicator of connection and disconnection position. The switchgear shall be completed with all necessary wiring fuses, auxiliary contacts terminal boards etc
32	**volume-III: at page 63 clause 1.3.5** Built-in/separate trolley mounted earthing switches for incomer and outgoing shall be provided.	Built-in/separate trolley mounted earthing switches (minimum one trolley for each sub-station for earthing cable end) for incomer and outgoing shall be provided.
33	**volume-III: at page 63 clause 1.3.6** All the high voltage compartments must have pressure discharge flap for the exit of gas due to internal are to insure operator safety. All the HV compartment design ensures conformity to IEC-60298 and must be type tasted for Internal Arc Test for one second.	All the high voltage compartments must have pressure discharge Flap for the exit of gas due to internal arc to ensure operator. All the HV compartment design ensures conformity of latest IEC and must be type tested for internal arc test for one second as per relevant and latest IS/IEC.
34	**volume-III: at page 64 clause 1.6.5** During detail engineering provision for shunt trip relays shall be decided by Employer for which contractor should not have any objection. Further, in this case, the series trip relays auxiliary unit contracts in the tripping circuit should be designed to handle current up to 150 Amp. and like wise trip coil voltage which appears across open contact of the series-tripping unit, be limited to 150 volts.	Provision for shunt relays shall be provided in the panels.
35	**volume-III: at page 65 clause 1.6.8** Arc flash Numerical relays to be provided with integral (no separate unit) arc flash protection system based on both current & optical input methods. Arc sensors shall be in cable chambers, bus bar chambers & circuit breaker chamber. Sensor shall cover any flash over occurring in the respective chambers.	Numerical relays to be provided with integral/independent arc flash protection system based on both current & optical input methods. Arc sensors shall be in cable chambers, bus bar chambers & circuit breaker chamber. Sensor shall cover any flash over occurring in the respective chambers. **If independent arc flash relay is provided than arc protection system should be configurable with add on modules and it should be possible to trip individual or breaker depending on the fault in various compartment. The total operating time of arc flash protection system covering both current and light shall be less than 10 ms (Documentary proof shall be submitted alongwith the bid). The arc flash relay shall have self supervision feature for arc sensors and external/independent module used, if any. The display unit shall be provided at control and relay panel (item no.4 of Price schedule) for protection system.**
36	**volume-III: at page 67 clause 1.13.1 (fourth para from top of the page.)** ❖ 1 No. 1250 Amp triple pole VCB fitted with isolating sockets, spring operated, manually	❖ 1 No. 1250 Amp triple pole VCB fitted with

	as well motor charged, manually/ electrically released spring closing mechanism with mechanical ON/OFF indicators suitable for a rupturing capacity of not less than 350 MVA at 11 kV for 3 seconds and fitted with one set of direct acting trip coils suitable for operation with AC series trip relays.	isolating sockets, spring operated , manually as well motor charged, manually/ electrically released spring closing mechanism with ON/OFF. Indicators suitable for a rupturing capacity of not less than 350 MVA at 11 KV for 3 second fitted with shunt trip.
37	**volume-III: at page 67 clause 1.13.1 (Eighth para from top of the page.)** ❖ 1 No. 3 phase resin cast, draw out type bus bar connected potential transformers of Ratio 11000/110 volts class 0.5 accuracy having minimum 50 VA output per phase to operate the A.C. static H.T. Tri-vector meter, voltmeter etc. and complete with HT fuse and LT MCB with monitoring contacts.	❖ 3 No. 1 Phase resin cast, draw out type line connected potential transformer of ratio 6.35 KV/ 63.5 V, class 0.5 accuracy having minimum 50 VA out put per phase to operte the AC static trivector meter, voltmeter etc and complete with HT fuse and LT MCB with monitoring contacts.
38	**volume-III: at page 67 clause 1.13.1 (Eleventh para from top of the page.)** ❖ 1 No. static digital Tri vector energy meter suitable for three phase 3 wire un-balanced load and CT, PT, ratio mentioned above, 0.5 accuracy class with load, survey and TOD/Tariff and MRI facility. TVM shall be as specification attached with this specification.	❖ 1 No. static digital Tri vector energy meter suitable for three phase 3 wire un-balanced load and CT, PT, ration mentioned above, 0.5 accuracy class, as per relevant IS.
39	**volume-III: at page 67 clause 1.13.1 (twelfth para from top of the page.)** ❖ 1 No. Non directional adjustable IDMT series trip O/C relay with definite minimum 3 seconds at 10 times plug setting. The relay shall be arranged for over current protection with setting from 50 to 200% of 5A on all three over current elements mounted in draw out case tropical zed with flag indicator.	❖ 1 No. Non directional adjustable IDMT O/C relay with definite minimum 3 seconds at 10 times plug setting. The relay shall be arranged for over current protection with setting from 50 to 200% of 5A on all three over current elements mounted in draw out case tropicalised with flag indicator.
40	**volume-III: at page 68 clause 1.13.4 (Fifth para from top of the page.)** 1 no. non directional triple pole adjustable IDMT, combined O/C and E/F [3 no. O/C and 1 no. E/F] AC series trip relay with instantaneous high set trip feature of low transient over reach not exceeding 5% with definite minimum 3 seconds at 10 times plug setting. The relay shall be arranged for over current protection with setting 30-120 % of 5 Amp. And for earth fault protection with setting 10-40 % mounted on a draw out case tropicalised with flag indicators. High set element of O/C shall have setting range of 5 to 20 times the rated current and the E/F elements shall be 2 to 8 times of rated current.	1 no. non directional triple pole adjustable IDMT, combined O/C and E/F [3 no. O/C and 1 no. E/F] relay with instantaneous high set trip feature of low transient over reach not exceeding 5% with definite minimum 3 seconds at 10 times plug setting. The relay shall be arranged for over current protection with setting 30-120 % of 5 Amp. And for earth fault protection with setting 10-40 % mounted on a draw out case tropicalised with flag indicators. High set element of O/C shall have setting range of 5 to 20 times the rated current and the E/F elements shall be 2 to 8 times of rated current.

41	**volume-III: at page 69 clause 1.15** **TESTS** The design of circuit breaker shall be proven through all the routine and in accordance with IS 13118: 1991/IEC 56 and any amendment thereof. Photocopy of all the test reports must be enclosed with the tender. Type test report earlier than 7 year from the date of tender opening shall not be acceptable.	**TESTS** The design of circuit breaker shall be proven through all the routine and in accordance with relevant and latest IS/IEC and any amendment thereof. Photocopy of all the test reports must be enclosed with the tender. Type test report earlier than 7 year from the date of tender opening shall not be acceptable.
42	**volume-II: section III (price schedule) item no. 3 (b)** VCB Panel for Incoming feeder with CT ratio 800 -400/5 (0.5) - 5 (0.5) – 5 (0.5) - 1 (PS) Amp.	VCB Panel for Incoming feeder with CT ratio 800 -400/5 (0.5) - 5 (1.0) – 5 (5P10) - 1 (PS) Amp.
43	**volume-II: section III (price schedule) item no. 3 (c)** VCB Panel for Outgoing feeder with CT ratio 800 -400/5 (0.5) - 5 (0.5) – 5 (0.5) - 1 (PS) Amp	VCB Panel for Outgoing feeder with CT ratio 800 -400/5 (0.5) - 5 (1.0) – 5 (5P10) - 1 (PS) Amp
44	**volume-II: section III (price schedule) item no. 3 (d)** VCB Panel for Outgoing feeder with CT ratio 200 -100/5 (0.5) - 5 (0.5) – 5 (0.5) - 1 (PS) Amp	VCB Panel for Outgoing feeder with CT ratio 200 -100/5 (0.5) - 5 (1.0) – 5 (5P10) - 1 (PS) Amp
45	**volume-II: section III (price schedule) item no. 4 (i)** VCB Panel for Incomer transformer with CT ratio 1200 -600/5(0.5)- 5(1.0) - 5(5P 10) - 1(PS) - 0.578 (PS) Amp.- 1 No.	VCB Panel for Incomer transformer with CT ratio 1200 -600/5(0.5)- 5(1.0) - 5(5P10) - 1(PS).- 1 No.
46	**volume-II: section III (price schedule) item no. 4 (ii)** VCB Panel for Outgoing feeder with CT ratio 800 -400/5 (0.5) - 5 (0.5) – 5 (0.5) - 1 (PS) Amp. -11 Nos.	VCB Panel for Outgoing feeder with CT ratio 800 -400/5 (0.5) - 5 (1.0) – 5 (5P10) - 1 (PS) Amp. -11 Nos.
47	**volume-II: section III (price schedule) item no. 4 (iii)** VCB Panel for Outgoing feeder with CT ratio 200 -100/5 (0.5) - 5 (0.5) – 5 (0.5) - 1 (PS) Amp. -1 No.	VCB Panel for Outgoing feeder with CT ratio 200 -100/5 (0.5) - 5 (1.0) – 5 (5P10) - 1 (PS) Amp. -1 No.
48	**volume-II: section III (price schedule) item no. 4 (iv)** VCB Panel for Capacitor bank with Provision of Undervoltage/ OverVoltage relay of ratio 800 -400/5 (0.5) - 5 (0.5) - 5 (0.5) - 1 (PS) Amp. -1 No.	VCB Panel for Capacitor bank with Provision of Undervoltage/ OverVoltage relay of ratio 800 -400/5 (0.5) - 5 (1.0) - 5 (5P10) - 1 (PS) Amp. -1 No.
49	**volume-III: at page 72.**	1.17 PROVISION OF NUMARICAL RELAY. 1.17.1Numerical relay shall be provided at (MC VCB)

<table>
<tr><td></td><td>(New clause) 1.17</td><td>switch gear panel, in equipments against item no. 3 (a),(b),(c), (d) and (e) of price schedule enclosed in volume –II: section-III of bid document.

1.17.2Numerical relay shall be provided at 11 KV control & relay (C&R) panel, in equipments against item no. 4(i),(ii),(iii) and (iv) of price schedule enclosed in volume-II: section –III of bid document.

1.17.3 The technical specification specified for numerical relay in control and relay panel shall also be applicable for numerical relay provided in (MC VCB) panel.

1.17.4 The technical specification specified for numerical relay in indoor (MC-VCB) panel shall also be applicable for numerical relay provided in C&R panel.

1.17.5The tri-vector meter of technical specification specified in (MC-VCB) panel shall also be provided in control and relay panel.</td></tr>
<tr><td>50</td><td>volume-III: at page 73 clause 2.5 (fifth row of para)

<table><tr><td>Neutral earthing</td><td>33 kV Grounded through Earthing

Transformer

11 kV solidly earthed</td></tr></table></td><td><table><tr><td>Neutral earthing</td><td>11 kV solidly earthed</td></tr></table></td></tr>
<tr><td>51</td><td>volume-III: at page 75 clause 3.1 (third para)

The individual panel shall be 2250 mm. in height with Channel base, 610 mm. in depth and of suitable width limited to 1000mm to accommodate the equipment at a suitable height, suitable gaps to facilitate easy workability as specified hereafter. Individual piece of Channel base of C&R Panel is to be provided to obtain the flexibility of inter-changing the Panel, if any.</td><td>The individual panel shall be 2250 mm. in height with Channel base, 610 mm. in depth and of suitable width limited to 600mm ± 10% to accommodate the equipment at a suitable height, suitable gaps to facilitate easy workability as specified hereafter. Individual piece of Channel base of C&R Panel is to be provided to obtain the flexibility of inter-changing the Panel, if any.</td></tr>
<tr><td>52</td><td>volume-III: at page 75 clause 3.2 (b)

The manufacturer shall ensure that the equipment specified and such unspecified complementary equipment required for completeness of protection/control scheme be properly accommodated in the panels without congestion and if necessary to provide panels with larger width. No price increase at a later date on this account shall be allowed.</td><td>The manufacturer shall ensure that the equipment specified and such unspecified complementary equipment required for completeness of protection/control scheme be properly accommodated in the panels without congestion.</td></tr>
<tr><td>53</td><td>volume-III: at page 75-76 clause 3.2 (f)

All holes and extension windows in the Panel shall be blanked and access doors shall be lined with compressible liners at the edges. The EMPLOYER will</td><td>All holes and extension windows in the Panel shall be blanked and access doors shall be lined with compressible liners at the edges. The contractor will shut off the bottom</td></tr>
</table>

	shut off the bottom crevices with cream cement, the Cable Entry holes with weak concrete and the cable trench with present R.C. Slabs or checker plate. All control and supply cables will be laid in a distribution trench running under the panel . The Cable will branch off into each cubicle through entry holes in the concrete floor opening in the bottom cubicles. Necessary Drawings for concrete floor and trench shall be supplied by the manufacturer to enable the EMPLOYER to construct the foundation floor for these panels. The drawings shall show details of the distributing trench, cable entry holes, glands and positions of grouting bolts. The EMPLOYER will prepare foundation with pocket for grouting bolts. The manufacturer shall supply channel base, suitable grouting bolts, lock nut and washers.	crevices with cream cement, the Cable Entry holes with weak concrete and the cable trench with present R.C. Slabs or chequered plate. All control and supply cables will be laid in a distribution trench running under the panel . The Cable will branch off into each cubicle through entry holes in the concrete floor opening in the bottom cubicles. The channel base shall also be in the scope of contractor which shall be fixed by the contractor at site with suitable grouting bolts, lock nut and washer etc.
54	**volume-III: at page 76 clause 3.2.** **(New para 'h')**	Control & relay (C&R) panel shall be manufactured by the same original equipment manufacturer (O.E.M) of 11 KV (MC VCB) switch gear panel to be supplied in this work.
55	**volume-III: at page 79 clause 7.0** **SPACE FOR CONTROL CABLES AND CABLE GLANDS** Sufficient space for receiving the Control Cables inside the Panel at the bottom of the cubicles and mounting arrangement for the terminal cable glands shall be provided. Removable type separate cable, entry plate (may be two) shall be fixed with bottom plate. The specification does not cover supply of control cables and cable glands for which the EMPLOYER will make separate arrangement.	SPACE FOR CONTROL CABLES AND CABLE GLANDS Sufficient space for receiving the Control Cables inside the Panel at the bottom of the cubicles and mounting arrangement for the terminal cable glands shall be provided. Removable type separate cable entry plate (may be two) shall be fixed with bottom plate. Supplying and fixing of cable gland for control cable shall be in the scope of contractor.
56	**volume-III: at page 82**	"equipment" in the second para from top of page 82 be read as: equivalent.
57	**volume-III: at page 86 clause 22 (B) first para** The primary requirements of the relays are to protect the respective single circuit or double circuit feeders and 33/11KV or 66/11 KV Power Transformers in the event of fault. The Directional/Non Directional E/F relays shall provide suitable sensitivity for limited earth fault current.	**Stands Deleted**
58	**volume-III: at page 89 (fifth row, sixth row and seven row of table.)** Inbuilt REF protection. Inbuilt HV & LV side over current & earth fault protection. Inbuilt transformer trouble auxiliary relay	**Stands Deleted**

59	**volume-III: at page 115 clause 29 (Third row of table.)** Service Charge for Commissioning Engineer — Firm rate shall be quoted separately for commissioning and integration of Relay with SCADA as per format. This rate shall be valid for three years from due date of submission of tender. However, the above cost will not be considered for evaluation.	**Stands Deleted**
60	**volume-III: at page 128 clause 3.** The system shall be such that coupler below the incomer panel shall energize the bus-bar of adjoining board on either side and there would be no interconnection between the incoming ACB and coupler ACB in the cubicle. The incomer or outgoing panels shall be suitable for further extension on either side.	The system shall be such that coupler below the incomer panel shall energize the bus bar of adjoining board on either side. The incomer or outgoing panels shall be suitable for further extension on either side. Mechanical inter lock shall be provided at incomer ACBs and bus coupler ACBs.
61	**volume-III: at page 128 clause 5.** The LT panel shall be total type test assembly (TTA)	(i) The LT panel shall be total type assembly (with equipment). (ii) All offered TTA panel should be temperature rise tested (with equipments) as per the relevant and latest IS/IEC. Bidder shall submit the temperature rise test report on TTA panel of rating 800A, 1600 A and 2500 A. The type test report earlier than seven year from the date of submission of bid shall not acceptable. (iii) During the execution of work all TTA panel modules (6 Nos.) as mentioned in BOQ , shall be got tested by contractor for temperature rise test (with equipments) as per the relevant and latest IS/IEC. (iv) Also one TTA panel, chosen by the NDMC shall be got tested by contractor for short circuit test (with equipments) as per the relevant and latest IS/IEC. For temperature rise test & short circuit test, the contractor shall bear all the expenses.
62	**volume-III: at page 129 clause 7.3 (2)** Separate fault indication by LED/ LEDs for each type of fault like Overload, Short Circuit, Instantaneous and Earth fault without using any auxiliary supply or battery resulting in faster fault diagnosis and reduced system down time. The release should provide indication of actual %age or absolute value of loading at any instant by LEDs or in case microprocessor, release should have absolute value of fault current. No external LED lamps are to be provided on panels.	Separate fault indication by LEDs/ LCDs for each type of fault like over load, short circuit, instantaneous and earth fault without using any auxiliary supply or battery for fault diagnosis. Release should have provision to display for the absolute value of fault current. No. external LED lamps are to be provided on panel.

63	**volume-III: at page 129 clause 7.3 (3)** The release shall be self powered and draw its power from the main breaker CTs and shall require no external power supply for its operation. Release should have LCD/ LED Display for current metering.	The release shall be self powered and draw its power from the main breaker CTs and shall require no. external power supply for its operation. Release should have LCD/LED display for showing real time parameter.
64	**volume-III: at page 129 clause 7.3 (4)** The release shall trip the breaker directly without any intermediately coil or with intermediate coil. The release shall also display all electrical parameters.	The release shall trip the breaker directly without any intermediate coil. Release should have LCD/LED screen for display of real time value of current and voltage.
65	**volume-III: at page 129 clause 7.3 (5)** The numerical relay shall have 3 over current and earth fault protection.	**Stands Deleted**
66	**volume-III: at page 129 clause 7.3 (6)** Circuit breaker trip unit shall have a display for measurements of current and voltage. It shall have a provision to view last 5 trip cause on trip unit.	Release should have a provision to view minimum last 5 trip history.
67	**volume-III: at page 130 clause 8 (second para)** The size of main busbar should be 2000 Amp and 3000 Amp capacity and control wiring must be fire retardant.	i. The size of main bus bar should be as per TTA design for respective rating. ii. Fish Plates and necessary hardware as required for coupling the main bus bar of TTA panels shall also be provided by contractor.
68	**volume-III: at page 131 clause 1 (para one)** Specifications for incoming panel of 2500 Amps 3 Pole ACB with coupler of 2500 Amps and outgoing panel of 800 Amp. 3 pole ACB, with protection release in top and bottom tiers having Bus Bar rating 3000 Amps**.**	Specifications for incoming panel of 2500 Amps 3 Pole ACB with coupler of 2500 Amps and outgoing panel of 800 Amp. 3 pole ACB, with protection release in top and bottom tiers.
69	**volume-III: at page 132 clause 1 (a)(v)** Provision for Bus connection: Suitable for connection to bus ducts from the top.	**Stands Deleted**
70	**volume-III: at page 132 clause 1 (b)(vii)** Provision shall be made for rising mains.	**Stands Deleted**
71	**volume-III: at page 132 clause 2 (para one)** Specifications for incoming panel of 1600 Amps 3 Pole ACB with coupler of 1600 Amps and outgoing panel of 800 A mp. 3 pole ACB, with protection release in top and bottom tiers having Bus Bar rating 2000 Amps**.**	Specifications for incoming panel of 1600 Amps 3 Pole ACB with coupler of 1600 Amps and outgoing panel of 800 A mp. 3 pole ACB, with protection release in top and bottom tiers.

<table>
<tr><td>72</td><td>volume-III: at page 132 clause 2 (a)(v)

Provision for Bus connection: Suitable for connection to bus ducts from the top.</td><td>Stands Deleted</td></tr>
<tr><td>73</td><td>volume-III: at page 132 clause 2 (c)(vii)

Provision shall be made for rising mains.</td><td>Stands Deleted</td></tr>
<tr><td>74</td><td>volume-III: at page 133 clause 3

In off position the doors of panel of all ACBs should remain closed.</td><td>In ON position the doors of panel of all ACBs should remain closed.</td></tr>
<tr><td>75</td><td>volume-III: at page 133 clause 3

Any extra cost of part/ component should be invariably mentioned in the price bids and not in the technical specifications. Also, the successful bidder should have to provide list of spare along with prices.</td><td>Stands Deleted</td></tr>
<tr><td>76</td><td>volume-III: at page 133 clause 15

Arrangement for fixing the energy meter i.e. wiring, cubicles terminal block and window shall be made on incoming panels and outgoing panels.</td><td>1 No. static digital Tri vector energy meter as per relevant IS, suitable for three phase 4 wire un-balanced load and compatible to work with CT ratio-/5Amp., 0.5 accuracy class.</td></tr>
<tr><td>77</td><td>volume-III: at page 133 clause 16

<table><tr><td>CT (resin cast) for metering</td><td>:</td><td>CT (resin cast) for metering</td></tr><tr><td>Digital Meter</td><td>:</td><td>AE, Rishab, Schneider, Secure or of the same make as ACB</td></tr><tr><td>Selector switch</td><td>:</td><td>Kaycee, Salzer, Vaishno ,Schneider or of the same make as

ACB</td></tr><tr><td>Protection MCBs</td><td>:</td><td>Standard, Havells, Siemens, Control & switchgear, Schneider,

ABB , L&T or of the same make as ACB</td></tr><tr><td>Cable lugs</td><td>:</td><td>Dowels, Ismail, Jainson or of the same make as ACB</td></tr></table></td><td><table><tr><td>CT (resin cast) for metering</td><td>:</td><td>CT (resin cast) for metering</td></tr><tr><td>Digital Meter</td><td>:</td><td>AE, Rishab, Schneider, Secure or of the same make as ACB</td></tr><tr><td>Selector switch</td><td>:</td><td>Kaycee, Salzer, Vaishno ,Schneider or of the same make as

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<tr><td>78</td><td>volume-III: at page 134 clause 24

The height of bus bar chamber, spacing between bus bars, sequencing of bus bar phases etc should be as per NDMC drawings enclosed.</td><td>The GA drawing indicating overall dimensions alongwith height of bus bar chamber, spacing between bus bar's and bill of material etc. shall be submitted to NDMC for approval before manufacturing of LT panels.</td></tr>
<tr><td>79</td><td>volume-II: section –III price schedule. Item no. 5

SITC of 415 V, 35 MVA, 2000 A main bus bar arrangement at top, two tier LT ACB panels, as per Technical specifications enclosed at annexure -TS-V</td><td>SITC of 415 V, 35 MVA, main bus bar arrangement at top, two tier LT ACB panels, as per Technical specifications enclosed at annexure -TS-V including refurnishing of cable duct and floor beneath the panel, in following</td></tr>
</table>

<table>
<tr><td></td><td>including refurnishing of cable duct and floor beneath the panel, in following configuration.</td><td>configuration.</td></tr>
<tr><td>80</td><td>volume-II: section –III price schedule. Item no. 6

SITC of 415 V, 35 MVA 3000 A main bus bar arrangement at top, Two tier LT ACB panels, as per Technical specifications enclosed at annexure-TS- V including refurnishing of cable duct and floor beneath the panel, in following configuration.</td><td>

SITC of 415 V, 35 MVA, main bus bar arrangement at top, Two tier LT ACB panels, as per Technical specifications enclosed at annexure-TS- V including refurnishing of cable duct and floor beneath the panel, in following configuration.</td></tr>
<tr><td>81</td><td>volume-III: at page 134

(New clause)</td><td><u>Clause 29</u>

Cable entry arrangement:- TOP panel in two tier formation shall be capable of making connection in bus duct/ rising main from the top and also capable of cable entry from bottom panel in two tier formation shall be capable of cable entry from the bottom.</td></tr>
<tr><td>82</td><td>volume-III: at page 135 clause 1.1 (a)

This specification covers the design, manufacturing, testing, supply, erection & commissioning of 7.2 MVAR, 12.65 KV three phase indoor Auto Switched Capacitor Bank with bus bar arrangement at site for outdoor/indoor installation on panel including but not limited to 0.2% series reactors, capacitor switch/contactor, Isolator cum earth switch, LA, HT fuses, RVT, Automatic power factor controller and vacuum contactors and all necessary equipment for auto switching</td><td>

This specification covers the design, manufacturing, testing, supply, erection & commissioning of 7.2 MVAR, 12.65 KV three phase indoor Auto Switched Capacitor Bank with bus bar arrangement at site for indoor installation on panel including but not limited to 0.2% series reactors, capacitor switch/contactor, Isolator cum earth switch, RC surge suppresser, HT fuses, RVT, Automatic power factor controller and vacuum contactors and all necessary equipment for auto switching.</td></tr>
<tr><td>83</td><td>volume-III: at page 136 clause 4 (third row of table)

<table><tr><td>Service location</td><td>Suitable for Indoor / Outdoor use</td></tr></table></td><td>

<table><tr><td>Service location</td><td>Suitable for Indoor.</td></tr></table></td></tr>
<tr><td>84</td><td>volume-III: at page 137 clause 5.0 (second row of table)

<table><tr><td></td><td>There shall be one incomer panel for Isolator and

LA.

All other panels shall be each of 1.8Mvar.

Total 7.2Mvar</td></tr></table></td><td>

<table><tr><td></td><td>There shall be one incomer panel for Isolator and surge suppresser.

All other panels shall be each of 1.8Mvar.

Total 7.2Mvar</td></tr></table></td></tr>
<tr><td>85</td><td>volume-III: at page 137 clause 6.0 (first row of table)

<table><tr><td>Single phase capacitor</td><td>Totally enclosed, leak proof, dust proof suitable</td></tr></table></td><td></td></tr>
</table>

	unit	for outdoor application, comprising individual capacitor elements connected in series & parallel groups. Continuous operating current shall be minimum 1.43 times to max. 1.65 times as per clause 6.2 of IS 13925.

Single phase capacitor unit	Totally enclosed, leak proof, dust proof suitable for outdoor application, comprising individual capacitor elements connected in series & parallel groups. Continuous operating current shall be maximum 1.43 times clause 6.2 of IS 13925.

86 **volume-III: at page 138 clause 6.0 (seventh and eighth row of table)**

6.10	External fuse	Each capacitor element shall be protected by External HRC fuse of suitable rating and interruption capacity so that a faulty capacitor element shall be disconnected by fuse. The fuse shall satisfactorily operate under ambient conditions. The following requirements shall be considered while selecting the right size of fuse. a. Ability to withstand the maximum discharge current from healthy capacitor element. b. Capability of handing fault current so as to
6.11	Surge arrestor	Blow off before the in case rupture takes place thereby avoiding.

6.10	External fuse	Each step of capacitor bank shall be protected by External HRC fuse of suitable rating and interruption capacity so that a faulty capacitor element shall be disconnected by fuse. The fuse shall satisfactorily operate under ambient conditions. The following requirements shall be considered while selecting the right size of fuse. a. Ability to withstand the maximum discharge current from healthy capacitor element. b. Capability of handing fault current so as to
6.11	Surge arrestor	RC surge suppresser

87 **volume-III: at page 139 clause 8.0 (first and second row of table)**

8.1	Installation	Outddoor/Indoor
8.2	Type	Metal Oxide

8.1	Installation	Indoor
8.2	Type	Metal Oxide **(stands deleted)**

88 **volume-III: at page 140 clause 10.0 (fourth row of table)**

10.9	Series reactor short time withstand current rating for 3 seconds	16 times capacitor rated current at 130% rated voltage

10.9	Series reactor short time withstand current rating for 2 seconds	16 times capacitor rated current at 130% rated voltage

89	**volume-III: at page 142 clause 11.0 (first row of table)** 11.3 | | ACU Should be SCADA Compatible. The DC control Voltage for operation of the ACU shall be taken from substation DCDB. The required control voltage shall be either 50VDC or 220VDC	11.3 | | ACU Should be SCADA Compatible. The DC control Voltage for operation of the ACU shall be taken from substation DCDB. The required control voltage shall be either 30VDC
90	**volume-III: at page 143 clause 13.4 (first row of table)** 13.4 | Discharge characteristic as per IS 13925 part1 | a. Each capacitor single phase unit residual voltage after disconnection from mains supply shall be 50V (maximum) within 10 minutes b. Capacitor bank residual voltage after	13.4 | Discharge characteristic as per IS 13925 part1 | a. Each capacitor single phase unit residual voltage after disconnection from mains supply shall be 50V (maximum) within 10 minutes b. Capacitor bank residual voltage after disconnection from mains supply shall be 50V (maximum) within 10 minutes
91	**volume-III: at page 145 clause 18.0 (seventh row of table)** 2. | LA |	2. | Surge suppresser |
92	**volume-III: at page 148 (seventeenth,twenty first and twenty third row of table)** 25.6 | Short time withstand current capacity for 3sec (min 16 times capacitor rated current at 130% rated voltage)	25.6 | Short time withstand current capacity for 2sec (min 16 times capacitor rated current at 130% rated voltage)
93	**volume-III: at page 151 clause 1.0 (first para)** Supply, Laying, Testing, and Commissioning of Metal enclosed non-segregated phase bus duct assemblies to be used for incoming connection from the transformers to the L.T Switchboard . The enclosure shall be made of minimum 3mm thick Aluminium alloy. The section of the bus ducts shall be of adequate strength to withstand the internal or	Supply, Laying, Testing, and Commissioning of Metal enclosed non-segregated phase bus duct assemblies to be used for incoming connection from the transformers to the L.T Switchboard . The enclosure shall be made of minimum 3mm thick Aluminium alloy/MS sheet duly powder coated. The section of the bus ducts shall be of adequate strength to withstand the internal or external

<table>
<tr><td></td><td>external forces resulting from the various operating conditions.</td><td>forces resulting from the various operating conditions.</td></tr>
<tr><td>94</td><td>volume-III: at page 152 clause 1.10

An earth bus running along the length of the bus duct and connecting to each bus duct section shall be provided. Necessary earthling arrangement for connecting the earth bus to owner's station earthling bus shall be provided. All accessories and hardware required for earthling arrangement shall be provided by the vendor .Bus enclosure material is made out of 3mm thick Al. alloy sheet conforming to IS-737.</td><td>

An earth bus running along the length of the bus duct and connecting to each bus duct section shall be provided. Necessary earthling arrangement for connecting the earth bus to owner's station earthling bus shall be provided. All accessories and hardware required for earthling arrangement shall be provided by the vendor.</td></tr>
<tr><td>95</td><td>volume-III: at page 152 clause 1.12

Bus conductor material shall be electrolytic grade of aluminum alloy conforming to relevant Indian standards IS 5082. The section of the bus conductor shall be rectangular. Copper laminated flexible at transformer side and aluminum laminated flexible at switchboard shall be provided.</td><td>Bus conductor material shall be electrolytic grade of aluminum alloy conforming to relevant Indian standards IS 5082. The section of the bus conductor shall be rectangular. Copper laminated flexible at transformer side and switch board shall be provided.</td></tr>
<tr><td>96</td><td>volume-III: at page 153 clause 1.17

One no. Silica gel breather assembly on indoor as well as outdoor bus duct shall be provided. Phase cross over chambers shall be provided as per the requirement.</td><td>Stands Deleted</td></tr>
<tr><td>97</td><td>volume-III: at page 153 clause 1.18

All internal wiring shall be done with 650V/1100V grade FRLS PVC insulated stranded copper cable of at least 2.5 Sq.mm.</td><td>Stands Deleted</td></tr>
<tr><td>98</td><td>volume-III: at page 154 clause 4.0

The supporting structure shall be fabricated from standard steel sections and shall be hot dip galvanized after fabrication to attain required thickness. Supporting structure shall be pre treated as per IS 6005. The supporting structures shall be designed to withstand the dead weight of the bus duct, short circuit forces under maximum fault conditions, wind load and forces due to seismic accelerations. The supporting structures shall include supporting members, brackets, hangers, longitudinal beams, channels, nuts, insulating washers, and all other hardware which are necessary for the erection and support of the entire bus duct installation.

All the accessories and hardware of ferrous material shall be hot dip galvanized. Each supporting structure shall be securely connected at two points to the earthling bus. All necessary hardware such as clamps, connectors, etc. required for this purpose shall be furnished by the vendor</td><td>The supporting structure shall be fabricated from standard steel. The supporting structures shall be designed to withstand the dead weight of the bus duct, short circuit forces under maximum fault conditions, wind load and forces due to seismic accelerations. The supporting structures shall include supporting members, brackets, hangers, longitudinal beams, channels, nuts, insulating washers, and all other hardware which are necessary for the erection and support of the entire bus duct installation. All the accessories and hardware of ferrous material shall be hot dip galvanized. All necessary hardware such as clamps, connectors, etc. required for this purpose shall be provided by the vendor.</td></tr>
<tr><td>99</td><td>volume-III: at page 181 clause 1.4 (fifth row and eighth of table)

<table><tr><td>8.</td><td>Conductor size</td><td>Sq.mm</td><td>400</td></tr><tr><td>11.</td><td>Short Circuit Current</td><td>kA</td><td>18.35 for 3 secs.</td></tr></table></td><td>

<table><tr><td>8.</td><td>Conductor size</td><td>Sq.mm</td><td>150</td></tr><tr><td>11.</td><td>Short Circuit Current</td><td>kA</td><td>14.1 for 3 secs.</td></tr><tr><td></td><td></td><td></td><td></td></tr></table></td></tr>
</table>

<table>
<tr>
<td>100</td>
<td>volume-III: at page 148- 149 clause 18 (Sr No. 26)
<table>
<tr><td>26</td><td>Lightning Arrestor</td><td></td></tr>
<tr><td>26.1</td><td>Name of manufacturer</td><td></td></tr>
<tr><td>26.2</td><td>Type – Gapless ZnO</td><td></td></tr>
<tr><td>26.3</td><td>Rated voltage</td><td></td></tr>
<tr><td>26.4</td><td>Nominal Discharge Current</td><td></td></tr>
<tr><td>26.5</td><td>Class - III</td><td></td></tr>
<tr><td>26.6</td><td>Insulation withstand voltage</td><td></td></tr>
<tr><td>26.7</td><td>Crrepage distance</td><td></td></tr>
</table></td>
<td>Stands Deleted</td>
</tr>
<tr>
<td>101</td>
<td>volume-I: Section-V Page 4 clause 13(xii)

Performance of the equipments to be installed in this project should be proven for at least three years for successful operation. The bidder shall submit the performance certificate of successful operation of particular make & model of equipment to be used in this project for at least 10% of quantity mentioned in the BOQ.</td>
<td>Performance of the equipments to be installed in this project should be proven for successful operation for a minimum of one year (performance report for 1000 & 1600 KVA, oil type and dry type distribution transformer, supplied, as per earlier IS standard shall also be acceptable). The bidder shall submit the performance certificate of successful operation of equipment confirming to the specification of this bid document, at least 10% of quantity mentioned in the BOQ.</td>
</tr>
</table>

The other terms and conditions of bidding document will remain same.

Sd/-

Executive Engineer (IPDS)
Email:- eeipds.elect@ndmc.gov.in