



BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING MANAGEMENT, NOIDA

Date-2-May-20

CORRIGENDUM- 04

PROJECT	:	1 X 660 MW UPRVUNL PANKI TPP
PACKAGE	:	Oil Filled Service Transformers
ENQUIRY NO	:	PE/PG/PKI/E-6404/2019 Dtd. 07.03.2020
SUBJECT	:	Amendment to Enquiry terms & conditions and Technical Specifications

Type of Corrigendum			
Technical Corrigendum -	☒	Commercial Corrigendum -	☒

In reference to the above-mentioned tender enquiry for **OIL FILLED SERVICE TRANSFORMER** package, bidders to please note the following:

Technical Amendment: -

Amendment to technical specifications is being issued through this corrigendum, as below:

- a) Annexure-II of Technical specifications (modified drawings submission schedule).
- b) Packing details of Oil filled Service transformer, which shall also be considered part of technical specifications as Annexure IV to Section I.
- c) The statement " The bidder shall decide CT details. CT calculation shall be submitted for approval." On page 27 of 75 of technical specification shall be replaced with following- " CT details indicated are tentative. CT detailed particulars shall be given to successful bidder during detailed engineering. There shall be no commercial implication to BHEL on this account.
- d) BHEL Replies of Pre-bid queries of all bidders for information to all bidders.

Commercial amendment: -Delivery completion schedule of the package has been revised, the same shall be as per revised Annexure-I to NIT, (enclosed).

Further, following clause mentioned in the delivery schedule of NIT shall not be applicable.

- i) Non-applicable drawings shall be decided during execution of the package.
- ii) Wherever schedule of drawings/documents submission/resubmission is stipulated in the technical specifications, same shall be superseded by delivery specified in the enquiry letter.

All other terms and conditions of the tender enquiry remain unchanged. All the bidders are requested to quote accordingly.

Yours faithfully,
For and on behalf of BHEL-PEM

GAURAV JAIN
SR. MGR/PG-III

Ref: BHEL-PEM Tender Enquiry No. PE/PG/PKI/E-6404/2019 dated 07.03.2020 for supply of Oil Filled Service Transformers for 1 X 660 MW PANKI TPS as per Technical Specification No. PE-TS-426-302-E001, Rev 00

Revised-Annexure-I to NIT (for Delivery completion schedule)

BHEL Drawing / Document No.	Drawing / Document Title	Primary/ Secondary	Drg Sch for Vendors	Standard Delivery Terms for Supply Portion (including short circuit test & other typeTests)
PE-V0-426-302-E149	L.V. BUSHING, LVN BUSHING, H.V. BUSHING FOR 2 MVA TRANSFORMER (11/3.45 KV)	Primary	R-0 within 28 days from PO & subsequent revisions within 10 days of comments received from BHEL. BHEL shall furnish comments / approval on each submission within 18 days from receipt.	Within Eight (08) months from date of CAT-1 approval of Primary drawing/documents, subjected to drawing/document submission/re-submission schedule as stipulated, in case of any delay in submission/re-submission of Primary drawing/documents, then same shall be reduced from the given delivery period. Delay in BHEL's comments/approval beyond 18 days shall also be considered for delay analysis.
PE-V0-426-302-E249	L.V. BUSHING, LVN BUSHING, H.V. BUSHING FOR 5 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E349	L.V. BUSHING, LVN BUSHING, H.V. BUSHING FOR 10 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E142	OUTLINE GENERAL ARRANGEMENT DRAWING [OGA], LV BUS DUCT TRUNKING, GENERAL ARRANGEMENT OF MARSHALLING BOX, HV CABLE BOX ARRANGEMENT DRAWING FOR 2 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E242	OUTLINE GENERAL ARRANGEMENT DRAWING [OGA], LV BUS DUCT TRUNKING, GENERAL ARRANGEMENT OF MARSHALLING BOX, HV CABLE BOX ARRANGEMENT DRAWING FOR 5 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E342	OUTLINE GENERAL ARRANGEMENT DRAWING [OGA], LV BUS DUCT TRUNKING, GENERAL ARRANGEMENT OF MARSHALLING BOX, HV CABLE BOX ARRANGEMENT DRAWING FOR 10 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E151	VALVE SCHEDULE PLATE, RATING & DIAGRAM PLATE FOR 2 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E251	VALVE SCHEDULE PLATE, RATING & DIAGRAM PLATE FOR 5 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E351	VALVE SCHEDULE PLATE, RATING & DIAGRAM PLATE FOR 10 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E152	WIRING DIAGRAM FOR MARSHALLING BOX FOR 2 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E252	WIRING DIAGRAM FOR MARSHALLING BOX FOR 5 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E352	WIRING DIAGRAM FOR MARSHALLING BOX FOR 10 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E141	TECHNICAL DATA SHEET FOR 2 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E241	TECHNICAL DATA SHEET FOR 5 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E341	TECHNICAL DATA SHEET FOR 10 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E803	PAINTING PROCEDURE FOR TRANSFORMERS (11/3.45KV)	Primary	1 Week from conduction of type tests	
PE-V0-426-302-E901	QUALITY PLAN FOR TRANSFORMERS (11/3.45 KV)	Primary		
PE-V0-426-302-E805	TYPE TEST REPORTS FOR TRANSFORMERS (11/3.45 KV)	Primary	R-0 within 28 days from PO & subsequent revisions within 10 days of comments received from BHEL. BHEL shall furnish comments / approval on each submission within 18 days from	
PE-V0-426-302-E144	FOUNDATION PLAN 2 MVA TRANSFORMER (11/3.45 KV)	Secondary		
PE-V0-426-302-E244	FOUNDATION PLAN 5 MVA TRANSFORMER (11/3.45 KV)	Secondary		
PE-V0-426-302-E344	FOUNDATION PLAN 10 MVA TRANSFORMER (11/3.45 KV)	Secondary	In case of non-conduction of short circuit test along with type test report of similar transformer.	
PE-V0-426-302-E155	DESIGN CALCULATIONS FOR SHORT CIRCUIT CAPABILITY (as applicable)	Secondary		
PE-V0-426-302-E153	TRANSPORTATION DETAILS FOR 2 MVA TRANSFORMER (11/3.45 KV)	Secondary	R-0 within 28 days from PO.subsequent revisions within 10 days of comments received from BHEL. BHEL shall furnish comments / approval on each submission within 18 days from receipt.	
PE-V0-426-302-E253	TRANSPORTATION DETAILS FOR 2 MVA TRANSFORMER (11/3.45 KV)	Secondary		
PE-V0-426-302-E353	TRANSPORTATION DETAILS FOR 2 MVA TRANSFORMER (11/3.45 KV)	Secondary		
PE-V0-426-302-E802	O & M MANUAL FOR TRANSFORMERS (11/3.45 KV)	Secondary	One week after approval of all primary drawings. Subsequent resubmission Within one week of BHEL comments.	
PE-V0-426-302-E804	BILL OF MATERIAL (BOM) FOR OIL FILLED TRANSFORMERS	Secondary		

Note:-

1. Vendor shall submit the dates for drawing/document submission/BHEL comments/ resubmission after approval of documents.

2. In BOM each of the item to be uniquely identified with item code no. or item Sl. no. Supplier to ensure that all the items which will find separate mention in the packing list are covered in detailed BOM.Supplier to give following undertaking in BOM: " The BOM provided here completes the scope (in content and intent) of material supply under PO no. ----- dtd ----- Any additional material which may become necessary for the intended application of supplied item/package will be supplied free of cost in most reasonable time."

TENDER ENQUIRY REF.	BHEL-PEM Tender Enquiry No. PE/PG/PKI/E-6404/2019 dated 07.03.2020 for supply of Oil Filled Service Transformers for 1 X 660 MW PANKI TPS as per Technical Specification No. PE-TS-426-302-E001, Rev 00		
DOCUMENT NAME	Replies to Pre-bid Queries of bidders		
S. No.	Bidders' Pre-bid queries	Query type	BHEL-PEM replies
1	This is in reference to IS2026 standard mentioned in the technical specifications for transformers, please note that IS2026 is not applicable for 2 MVA transformer and it can be manufactured only at IS1180 standard after the notice from government in 2017. Kindly confirm the same.	Technical	Please note that IS 1180 is for distribution transformers i.e secondary voltage of 433 Volt. The 2 MVA transformer as part of enquiry is 11/3.45 kV. Therefore, IS 1180 is not applicable for same. IS 2026 shall be applicable for same
2	We have short circuit test reports of following ratings : • 2.5 MVA, 33/0.433 kV , Z-6% (As per PGCIL specs) • 2 MVA, 11/0.433 kV, Z-10% (As per NTPC specs) • 10 MVA 11/3.45 kV , Z-8.5% (As per NTPC specs) As per the below clause, we would request you to confirm if our above reports of similar and higher rating will work for transformer ratings (2MVA, 5MVA and 10MVA) required in the project. 6.06.02 Short circuit test report of previously tested similar transformer for validation by comparison. Criteria for similarity of transformer for acceptance of Short circuit test report shall be as given in the Annexure-B of IEC-60076-5.	Technical	Please note that in order to comply to technical specification requirement, short circuit test need to be conducted on one transformer of each rating as per cl. No. 8.01.00 II of Annexure IIIA to section I (page 24 of 75 of technical specification). Further, short circuit test reports are required to prove compliance to pre-qualifying criteria (point no. 1 of main technical PQR and point no. 3 of Annexure-1 of technical PQR). Refer these clauses of technical PQR.
3	PQR CLARIFICATION- If vendor will pass evaluation either of the 2 categories, shall vendor awarded for both category of all transformer.	Technical PQR	Please note that the items being procured under this enquiry correspond to Cat 2 – MV service transformers only. Further, PQR Evaluation shall be done for Cat-2 transformers only.
4	PQR CLARIFICATION- We have type report of 500KVA, 11/0.433KV and 8 MVA, 33/11KV Transformer which was done at Mar '2017 and Mar '2019 respectively.	Technical PQR	Type test reports are to be submitted as per point no.1 of Main PQR for Cat-2 transformers (MV service transformers). 500 KVA, 11/0.433 kV does not fall in Cat 2 transformers. Type test reports of 33/11 kV, 8 MVA Transformers are acceptable if found ok. Further, short circuit reports have to be submitted as per point no. 3 of Annexure 1 of Technical PQR (Project specific criteria).

5	PQR CLARIFICATION- Can we submit the performance certificate of 16 MVA, 110/11KV Transformer for 2 years and 10 MVA, 110/11KV Power transformer for 2 years under option 1	Technical PQR	Performance certificate of 16 MVA, 110/11KV Transformer for 2 years and 10 MVA, 110/11KV Power transformer for 2 years can be submitted under option 1. However, being the more stringent requirement, bidder to comply to point no. 1 of Annexure-1 of technical PQR regarding complete requirement of performance certificates (i.e. 1. one each at two different installations i.e two different project sites or two different contracts and 2. Transformers should have been in successful operation for a period of atleast 2 years prior to 02.11.2015.)
6	PQR CLARIFICATION- We had supplied 40 Nos of LV Transformer (15 Nos in the range of 1 MVA to 2.5 MVA) and 30 Nos of Transformer under category 1 and 2 respectively.	Technical PQR	Noted. However, please note that above mentioned quantity (30 nos. for Cat-2) should have been supplied in last 10 years from the date of techno commercial bid opening.
7	PQR CLARIFICATION- Please confirm will you accept the type test report (Short Circuit test) of higher rating transformer like 16 MVA, 110/11KV Power Transformer.	Technical PQR	Type test reports of higher rating transformer like 16 MVA, 110/11 kV power transformers are also acceptable against point no. 1 of technical PQR if conducted at independent Lab or witnessed by third party. However, short circuit reports have to be submitted as per point no. 3 of Annexure 1 of Technical PQR (Project specific criteria).
8	PQR CLARIFICATION- We supplied ten nos. of 16MVA, 110/11KV Transformer to two different projects in TNEB. We type tested (including shot circuit test) for 16 MVA 110/11 KV transformer on 06.05.2009. Please confirm whether your pre qualification of Annexure -1 will comply or not.	Technical PQR	The details mentioned comply to Annexure-1 of technical PQR if found ok.
9	BHEL PQR requirement: Bidder should have manufactured & supplied at least two numbers (one each at two different installations i.e. two different contracts) of atleast highest offered rating oil filled transformers (i.e. at least 11/3.45 kV, 10 MVA) which should have been in successful operation for a period of at least two (2) years prior to the date 02.11.2015. Bidder's Standing Qualifying Compliance: We have manufactured and supplied 5 Nos of 33/11 KV 12.5 MVA Power Transformer to NPCL , Greater Noida in FY 2014-15, which are in successful operation for more than 4 years	PQR	Rating of 33/11 kV, 12.5 MVA is acceptable against this clause. However, bidder to comply to other requirements of this clause, i.e. 1. at least two numbers (one each at two different installations i.e. two different contracts) 2. successful operation for a period of at least two (2) years prior to the date 02.11.2015

10	BHEL PQR requirement: Bidder should have his own facilities for conducting all routine and type tests as per IS : 2026 (except short circuit test, degree of protection & impulse tests which can be conducted at Govt. Lab/ Govt. approved independent lab). Bidder's Standing Qualifying Compliance: We are having our own facilities for conducting all routine and type tests as per IS : 2026 (except short circuit test, degree of protection & impulse tests which can be conducted at Govt. Lab/ Govt. approved independent lab).	PQR	Noted.
11	BHEL PQR requirement: The similar type & rating of transformer considered for above (1) should have been successfully short circuit tested. Bidder's Standing Qualifying Compliance: We are having short circuit test conducted on 33/11 KV 8.0 MVA Power Transformer. The short circuit test report is more than 5 years old. Bidder's remarks: No fresh type tests shall be conducted on the offered ratings of the transformers for the current Bid.	PQR	1. Please note that to establish qualification against Technical PQR (point no.3 of Annexure 1), following needs to be fulfilled by bidder- “The similar type & rating of transformer considered for above (1) should have been successfully short circuit tested. Reports for same shall be submitted.” 2. Further, in order to comply to technical specification requirement, type tests need to be conducted on one transformer of each rating as per cl. No. 8.01.00 II of Annexure IIIA to section I (page 24 of 75 of technical specification). Further, Please note that point no. 9 to 11 above correspond to annexure-1 to technical PQR. bidder need to submit PQR credentials for Main Technical PQR (PE- PQ-999-302-E001 point 1 to 6) also.

12	As per Specification	Suggested	Delivery completion schedule (Annexure-I to NIT)	Please refer revised Delivery completion schedule being issued through this corrigendum (revised Annexure-I) wherein "six" months period has been revised to "eight" months. The drawings/ documents details & their submission time have also been revised in the revised Annexure-I.
	Annexure-I Delivery Schedule: Within six (06) months from date of CAT-1 approval of Primary drawing/documents, subjected to drawing/document submission /re-submission schedule as stipulated, in case of any delay in submission/re-submission of Primary drawing/documents, then same shall be reduced from the given delivery period. Delay in BHEL's comments/approval beyond 18 days shall also be considered for delay analysis.	Annexure-I Delivery Schedule: Within six (06) months from date of CAT-1 approval of Primary drawing/documents, subjected to drawing/document submission /re-submission schedule as stipulated, in case of any delay in submission/re-submission of Primary drawing/documents, then same shall be reduced from the given delivery period. Delay in BHEL's comments/approval beyond 18 days shall also be considered for delay analysis. 4 (Four) months extra for short circuit test. Short Circuit test depends on availability of Test dates from third party labs.		
13	As per Specification	Suggested	Delivery completion schedule (Annexure-I to NIT)	Please refer revised Delivery completion schedule being issued through this corrigendum (revised Annexure-I) wherein "14" days period has been revised to "28" days. The drawings/ documents details & their submission time as also the delivery completion time have been revised in the revised Annexure-I.
	Annexure-I Drawing Submission: R0 within 14 days from PO & subsequent revisions within 10 days of comments received from BHEL, BHEL shall furnish comments / approval on each submission within 18 days from receipt.	Annexure-I Drawing Submission: R0 within 60 days from PO & subsequent revisions within 20 days of comments received from BHEL, BHEL shall furnish comments / approval on each submission within 18 days from receipt.		
14	As per Specification	Suggested	GCC	Relevant clause as per BHEL PEM GCC Rev 07 shall be applicable.
	Clause No. 16.2.1 (a) of GCC Delayed Delivery: Purchaser reserves the right to recover from the seller/contractor, as agreed liquidated damages and not by way of penalty, a sum equivalent to half (1/2) percent and applicable GST thereon, of the total main supply contract price excluding GST per week or part thereof, subject to a maximum of ten (10) percent of the total main supply contract price excluding GST, if the Seller/Contractor fails to deliver any part of the ordered goods/stores within the period stipulated in the Order/Contract.	Clause No. 16.2.1 (a) Delayed Delivery: Purchaser reserves the right to recover from the seller/contractor, as agreed liquidated damages and not by way of penalty, a sum equivalent to half (1/2) percent of the Ex-Works Price of the undelivered portion excluding GST per week or part thereof, subject to a maximum of Five (5) percent of the Ex-Works Price of the undelivered portion excluding GST, if the Seller/Contractor fails to deliver any part of the ordered goods/stores within the period stipulated in the Order/Contract.		

15	As per Specification Clause No. 9.2.1 of GCC Payment of basic price of materials supplied, as per PO/approved billing schedule, along with freight, taxes and duties (as applicable), shall be paid against receipt of material (receipted LR) at site on pro-rata basis. 15% of basic price of materials supplied will be retained as security deposit which will be released on pro-rata basis as below i) 10% will be released on pro-rata basis after submission of Material Receipt Certificate (MRC) from project site engineer of Owner/Purchaser. ii) 5% shall be released after i) submission of certificate of submission of all the final documents for the package (as per Annexure IX (A), duly certified by Engineering Department of Purchaser and ii) successful completion of Performance Guarantee (PG)/Demonstration Test and handing over of the system/package to Customer/BHEL, if applicable, as per Order/Contract. Note: If the Performance Guarantee (PG)/Demonstration Test and handing over of the system/package, if applicable, as per Order/Contract is not conducted up to 36 months from supply completion for reasons not attributable to the vendor, then last 5% security deposit will be released on submission of certificate of all final documents for the package (as per Annexure IX (A), duly certified by Engineering Department of Purchaser. However, PBG for contract shall be released only after completion of contractual obligations.	Suggested Clause No. 9.2.1 of GCC Payment of basic price of materials supplied, as per PO/approved billing schedule, along with freight, taxes and duties (as applicable), shall be paid against receipt of material (receipted LR) at site on pro-rata basis. 15% of basic price of materials supplied will be retained as security deposit which will be released on pro-rata basis as below i) 10% will be released on pro-rata basis after submission of Material Receipt Certificate. (MRC) from project site engineer of Owner/Purchaser. ii) 5% i) submission of certificate of submission of all the final documents for the package (as per Annexure IX (A), duly certified by Engineering Department of Purchaser and ii) successful completion of Performance Guarantee (PG)/Demonstration Test and handing over of the system/package to Customer/BHEL, if applicable, as per Order/Contract. Note: However, Corporate Guarantee for contract shall be released only after completion of contractual obligations.	GCC	Relevant clause as per BHEL PEM GCC Rev 07 shall be applicable. Please refer to payment terms as per clause no. 9.1 (being supply scope package)
16	As per Specification Clause No. 9.6 of GCC Release of Payment: Vendors shall submit billing documents for payment directly to BHEL. Payment will be released within 60 days after submission of complete documents as per clause no. 9.7.2-9.7.5 below or as per order/contract (45 days for vendors qualified and registered as micro or small as per MSMED Act.)	Suggested Clause No. 9.6 of GCC Release of Payment: Vendors shall submit billing documents for payment directly to BHEL. Payment will be released within 15 days after submission of complete documents as per clause no. 9.7.2-9.7.5 below or as per order/contract.	GCC	Relevant clause as per BHEL PEM GCC Rev 07 shall be applicable.



TECHNICAL SPECIFICATION FOR OIL FILLED TRANSFORMERS

1 X 660 MW PANKI TPS

SPECIFICATION NO. PE-TS-426-302-E001

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ANNEXURE-II

DOCUMENTS REQUIRED AFTER AWARD OF LOI

DRAWING/DOCUMENT NO	DRWAING/DOCUMENT DESCRIPTION	DOCUMENT TYPE	FIRST SUBMISSION	RESUBMISSION
PE-V0-426-302-E149	L.V. BUSHING, LVN BUSHING , H.V. BUSHING FOR 2 MVA TRANSFORMER (11/3.45 KV)	Primary	R0 within 28 days from PO	Within 10 days of comments received from BHEL
PE-V0-426-302-E249	L.V. BUSHING, LVN BUSHING , H.V. BUSHING FOR 5 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E349	L.V. BUSHING, LVN BUSHING , H.V. BUSHING FOR 10 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E142	OUTLINE GENERAL ARRANGEMENT DRAWING [OGA] , LV BUS DUCT TRUNKING, GENERAL ARRANGEMENT OF MARSHALLING BOX , HV CABLE BOX ARRANGEMENT DRAWING FOR 2 MVA TRANSFORMER (11/3.45 KV)	Primary	R0 within 28 days from PO	Within 10 days of comments received from BHEL
PE-V0-426-302-E242	OUTLINE GENERAL ARRANGEMENT DRAWING [OGA] , LV BUS DUCT TRUNKING, GENERAL ARRANGEMENT OF MARSHALLING BOX , HV CABLE BOX ARRANGEMENT DRAWING FOR 5 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E342	OUTLINE GENERAL ARRANGEMENT DRAWING [OGA] , LV BUS DUCT TRUNKING, GENERAL ARRANGEMENT OF MARSHALLING BOX , HV CABLE BOX ARRANGEMENT DRAWING FOR 10 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E151	VALVE SCHEDULE PLATE , RATING & DIAGRAM PLATE FOR 2 MVA TRANSFORMER	Primary	R0 within 28 days from PO	Within 10 days of comments received from BHEL



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	(11/3.45 KV)			
PE-V0-426-302-E251	VALVE SCHEDULE PLATE , RATING & DIAGRAM PLATE FOR 5 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E351	VALVE SCHEDULE PLATE , RATING & DIAGRAM PLATE FOR 10 MVA TRANSFORMER (11/3.45 KV)	Primary	R0 within 28 days from PO	Within 10 days of comments received from BHEL
PE-V0-426-302-E152	WIRING DIAGRAM FOR MARSHALLING BOX FOR 2 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E252	WIRING DIAGRAM FOR MARSHALLING BOX FOR 5 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E352	WIRING DIAGRAM FOR MARSHALLING BOX FOR 10 MVA TRANSFORMER (11/3.45 KV)	Primary	R0 within 28 days from PO	Within 10 days of comments received from BHEL
PE-V0-426-302-E141	TECHNICAL DATA SHEET FOR 2 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E241	TECHNICAL DATA SHEET FOR 5 MVA TRANSFORMER (11/3.45 KV)	Primary		
PE-V0-426-302-E341	TECHNICAL DATA SHEET FOR 10 MVA TRANSFORMER (11/3.45 KV)	Primary	R0 within 28 days from PO	Within 10 days of comments received from BHEL
PE-V0-426-302-E803	PAINTING PROCEDURE FOR TRANSFORMERS (11/3.45 KV)	Primary		
PE-V0-426-302-E901	QUALITY PLAN FOR TRANSFORMERS (11/3.45 KV)	Primary	R0 within 28 days from PO	Within 10 days of comments received from BHEL
PE-V0-426-302-E805	TYPE TEST REPORTS FOR TRANSFORMERS (11/3.45 KV)	Primary	1 Week from conduction of type tests	
PE-V0-426-302-E144	FOUNDATION PLAN FOR 2 MVA TRANSFORMER (11/3.45 KV)	Secondary		
PE-V0-426-302-E244	FOUNDATION PLAN FOR 5 MVA TRANSFORMER (11/3.45 KV)	Secondary	R0 within 28 days from PO	Within 10 days of comments received from BHEL
PE-V0-426-302-E344	FOUNDATION PLAN FOR 10 MVA TRANSFORMER (11/3.45 KV)	Secondary	R0 within 28 days from PO	Within 10 days of comments received from BHEL



**TECHNICAL SPECIFICATION FOR
OIL FILLED TRANSFORMERS**

1 X 660 MW PANKI TPS

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PE-V0-426-302-E155	DESIGN CALCULATIONS FOR SHORT CIRCUIT CAPABILITY (as applicable)	Secondary	In case of non-conduction of short circuit test along with type test report of similar transformer.	In case of non-conduction of short circuit test along with type test report of similar transformer.
PE-V0-426-302-E153	TRANSPORTATION DETAILS FOR 2 MVA TRANSFORMER (11/3.45 KV)	Secondary	R0 within 28 days from PO	Within 10 days of comments received from BHEL
PE-V0-426-302-E253	TRANSPORTATION DETAILS FOR 5 MVA TRANSFORMER (11/3.45 KV)	Secondary		
PE-V0-426-302-E353	TRANSPORTATION DETAILS FOR 10 MVA TRANSFORMER (11/3.45 KV)	Secondary		
PE-V0-426-302-E802	O & M MANUAL FOR TRANSFORMERS (11/3.45 KV)	Secondary		
PE-V0-426-302-E804	BILL OF MATERIAL (BOM) FOR OIL FILLED TRANSFORMERS	SECONDARY	One week after approval of all primary drawings	Within one week of BHEL comments

Note-

1. Vendor shall submit the dates for drawing/document submission/BHEL comments/resubmission after approval of documents.
2. In BOM each of the item to be uniquely identified with item code no. or item Sl. no. Supplier to ensure that all the items which will find separate mention in the packing list are covered in detailed BOM. Supplier to give following undertaking in BOM: " The BOM provided here completes the scope (in content and intent) of material supply under PO no. ---- dtd ----- Any additional material which may become necessary for the intended application of supplied item/package will be supplied free of cost in most reasonable time."

1X660 MW Panki TPS
Annexure IV to Section I

Domestic Packing for Oil Filled Transformers Rating <10MVA

A. Transformer shall be despatched in open in such a manner there shall be no damage during transit.

B. Transformer Radiator Assembly, Conservator, Spares and Accessories shall be despatched in “Crate Packing” using wood.

C. Transformer Oil (Extra Oil + Spare Oil) shall be despatched in Non Returnable Sealed Drums with proper marking of Volume and Vendor details.

D. Paint for touchup shall be despatched in “Crate Packing” using wood.

E. CRATE PACKING DETAILS

1.0 PREPARATION OF PACKING CASES:

1.1 DIMENSIONS

1.1.1 Minimum number of planks shall be used for a shook.

1.1.2 Thickness of planks for Front, rear, top and bottom sides and binding, jointing battens shall be 25/20mm +2/-3 mm

1.1.3 Horizontal, vertical, diagonal planks shall be given for binding

1.1.4 Width of binding planks shall be minimum 100mm

1.1.5 Distance between any 2 binding planks shall be less than 750mm

1.1.6 Diagonal planks shall be used in between vertical binding planks when distance between inner to inner of vertical planks is more than 750mm

1.1.7 Distance of the outer edges of these planks from the edge of case shall be less than 250mm.

1.1.8 Diagonal planks are not required for top planks and width side, if the width of pallet is less than 750mm.

1.2 JOINTING OF PLANKS

Single length planks shall be used for cubicles whose overall length is less than 2400mm. For cubicles of length more than 2400mm, jointing is permitted. The jointing shall be done with one single or maximum of 2 planks of wood same as other planks of width 250 mm (minimum) with two rows of nails on either side of the joint in zigzag manner. From the joint along height side, it shall be of lap joint with overlap of at least the width of plank.

1.3 TONGUE AND GROOVE JOINTS

Two consecutive planks shall be joined by tongue and groove joint. Depth of tongue shall be 12+1 mm, thickness of tongue shall be 8 +1 mm. The groove dimensions shall be such that the tongue fits tightly into the groove to make a good joint. This type of joint can be done based on the product requirement wherever required.

1.4 PERMISSIBLE DEFECTS

Wood shall be free from knots, bows, visible sign of infection and any kind of decay caused by insects, fungus, etc. End splits: Longest end splits at each end shall be

measured and lengths added together. The added length shall not exceed 60mm per meter run of shook's. Wood pins shall be used to prevent further development of split. Surface cracks: Surface cracks with a maximum depth of 3mm are permissible. A continuous crack of any depth all along the length is not allowed.

1.5 OTHER MATERIALS

1.5.1 NAILS

The dia. of the nails shall be 3.15mm. The length of the nails shall be 65mm wherever two planks of 25mm thickness are joined and 75mm wherever a 25mm plank is joined to a 50mm plank.

1.5.2 BLUE NAILS

These are used for nailing bituminized Kraft paper/hessian cloth to the planks. The length of the nails shall be 16mm.

1.5.3 HOOP IRON STRIPS

These are used for strapping the boxes. The width of the strips shall be 19+1mm and thickness 0.6+0.01mm. The material shall be free from rust. If sufficient nailing is done for bigger boxes, strapping need not be done.

1.5.4 CLIPS

These shall be used for strapping the hoop iron strips on the boxes.

1.5.5 BRACKETS

These brackets are used for nailing to the corners of cubicle boxes. The brackets shall be of mild steel of thickness min 2mm and width 25+1mm. The brackets shall be of "L" shape, the length of each side being 100+2mm. Two holes shall be provided towards the end of each side for screwing /nailing.

1.5.6 MULTI LAYERED CROSS LAMINATED POLYTHELENE FILM 100GSM (Colourless) Multi Layered Cross Laminated Polyethylene Film are used to make covers to the jobs individually. The cross lamination gives qualities of extra toughness, together with flexibility and lightness coupled with good weather resistance to ultra violet rays.

1.5.7 RUBBERISED COIR

The rubberized coir is used as cushioning material. For the packing of loose items, items are to be arrested by using rubberized coir. For the packing of cubicles rubberized coir of thickness 25mm and width 75mm shall be used.

1.5.8 FASTENERS

Bolts, double nuts, spring washers will have to be used to hold the job that there shall be no jerk.

1.5.8 PACKING SLIP

Packing slip kept in the polyethylene bag shall be placed in the box at appropriate place. In addition, one more packing slip covered in polyethylene cover and packing slip holder shall be nailed to front / rear of case.

1.5.9 MARKING PLATE

Marking on the packing case shall be done as per the manufacturer standard.