Procurement of Plant for Clarifications - Design, Supply, Installation and Commissioning of 132kV Transmission Line Conductor Upgrading

ICB: PMD/EGMP/TLUP-077/78-01

CLARIFICATION 1: ISSUED BY NEPAL ELECTRICITY AUTHORITY

S.N.	From	Section/Clause No.	Comment/Question of Bidder	NEA Reply
1	Vol-1	Section 2, ITB & BDS, Clause 18.6	Quote " The prices quoted by the Bidder shall be Fixed. " Unquote : Since majority value of project will be driven from conductor supply, which is made up of highly volatile material i.e. aluminum, we request employer to consider supply of conductor on Variable basis. Please Confirm.	No changes in the PV clause
2	Vol-1	Section – 3, Clause1.3.4.1	The Bidder shall furnish guaranteed AC resistance per km (Rac) at temperature corresponding to the continuous operating current of 550 (650) Amp for different conductor under normal condition in "Form FUNC" attached in Section - 4 "Bidding Forms". We understand that Continuous operating current will be 550 Amp for ACCC Bear Conductor & 650 Amp for ACCC Duck Conductor. Please confirm if our understanding is correct.	Confirm
3	Vol-1	Section – 3, Clause1.3.7	In the comparison of Bids, only the CIP price component of each Bid for the Plant and Equipment offered from outside the Employer's country shall be increased by 15%. Kindly Clarify criteria of defining domestically produced plant and equipment, i.e. how much minimum percentage of value must have been added to the offer plant and equipment to be considered as domestically produced.	In the comparison of Bids, only the CIP price component of eac Bid for the Plant and Equipment offered from outside the Employer's country vis a vis the equipment supplied from withi Nepal shall be increased by 15%.
4	Vol-1	Section 3, Clause 2.4.1	Participation in at least two contracts that have been successfully or substantially completed within the last 10 (Ten) years and that are similar to the proposed contract, where the value of the Bidder's participation exceeds US$ 13.0 Million. The similarity of the Bidder's participation shall be based on design, supply, installation and commissioning of 132 kV or higher voltage Transmission Line involving Conductor stringing length of 450 km AND/OR design, supply, installation, testing and commissioning of Conductor upgrading of 132 kV or higher voltage Transmission Line with minimum conductor length of 450 Km. We understand, conductor upgradation of these lines are to be done in Hot Condition i.e. while one circuit is being upgraded, second circuit will be charged, which make it highly skilled job, which needs tremendous experience in Hot Line stringing. However NEA has not asked any specific experience of Hot Line strining. We request you to please ask for specific experience is this regard.	No changes in EQC is envisaged

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S.N.	From	Section/Clause No.	Comment/Question of Bidder	NEA Reply
5	Vol-1	Clause 2.5	The same must be validated by Notarized End User's Certificate issued by Utility. We request you to please relax requirement of Notarized documents, as COVID-19 has made public places high risk zones and visiting such places and arranging notarization is very challenging and risky task. Kindly accept our request of relaxing this requirement. However the requirement of notarizing the translated documents may remain there for the sake of authenticity.	No changes in EQC is envisaged
6	Vol - 1	Section 9, Appendix – 1, Payment Terms	HTLS Conductor shall be supplied and delivered in 3 (three) Lots (of equal quantity) and accordingly the Payment shall be made in 3 (three) installments. The payment for first Lot shall be made upon receipt of the invoice and shipping documents. The second lot of conductor shall be inspected and dispatched after the installation and testing of at least 60 % of HTLS conductor of the first lot has been completed. Similarly, the third lot of conductor shall be inspected and dispatched after the complete installation and testing of conductor of first lot and minimum 60 % of conductor installation and testing of the second lot.	
7			Please confirm following : - 1. We understand that Payment of second lot will be done only after testing of first circuit that is being strung. Please confirm if our understanding is correct. 2. We understand program of performance is schedule of Design, Supply, Installation Testing and Commissioning. Please confirm if our understanding is correct.	The NEA intends to install and charge the conductor section wise. The shutdown will be provided for daytime only, the circu shall be charged each day during peak hours. So, the payment for the 2nd lot will be made when 60% of 1st Lot conductor is installed and charged. 2. Confirm
8	Vol - 2	Section -1, Clause 2.1.1	De-stringing of existing conductor including dismantling of associated insulators of the existing ACSR conductor as mentioned above, Rerolling into a Drum and storing the dismantled conductor in NEA Local store or any other place designated by the Employer. The supply of the drums, if required shall be in the scope of the Contractors without any cost to NEA. Please Confirm Following : - 1. Drums supplied for ACCC Conductor can be used for re-rolling of dismantled conducted. Please confirm if our understanding is correct. If Not please clarify of drums to supplied under the contract will be of Wooden, Steel or Hybrid. 2. Please identify location of store, where dismantled conductor and associated insulators are to be handed over to NEA. 3. Please confirm if dismantled insulators are to be returned in wooden boxes	1. Confirm 2. Dhalkebar, Pathlaiya, Kushaha, Duhabi 3. Only the insulator that cannot be reused shall be dismantled and returned in wooden box.

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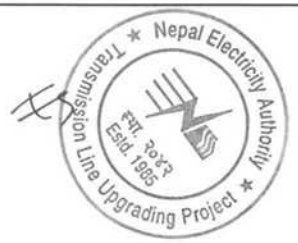
S.N.	**From**	**Section/Clause No.**	**Comment/Question of Bidder**	**NEA Reply**
9	Vol - 2	Section -1, Clause 2.1.1	Supply of HTLS conductor along with all necessary accessories, hardware and fittings completely compatible for use in stringing of proposed HTLS conductor by replacing the existing one. Please Confirm Following : - 1. We understand only live end (Line Side) of hardware fitting is to be supplied. Please confirm. 2. If completed set of hardware fittings is to be supplied, please provide drawings of existing fittings.	1. All required hardware and fitting for HTLS conductor in transmission line and hardware and fitting required for upgrading of conductors in the switchyard shall also be provide 2. The available drawings for substation equipment will be provided during DDE, else the contractor shall make the necessary site visit.
10	Vol – 2 & Vol 3	*Section -1, Clause 2.1.1 and Item No. G of Price Schedule - 1*	Supply of Insulators and hardware as much as the quantity required compensating the punctured and ageing insulators and hardware in the existing line. The insulators & hardware fittings (excluding clamps) if in good condition to be re-used. And All necessary accessories, hardware and fittings (Tension, suspension clamps, Connector etc.) required to complete the HTLS stringing works completely Request you to please quantify the aforementioned items instead of LOT.	The bidder is required to make the site visit and make their assessment, and quote accordingly.
11	Vol - 2	Section -1, Clause 2.1.1	Stringing of the HTLS conductor along with insulator, hardware fittings and other accessories required complete and commissioning of the line without changing / modification of existing transmission line structures and foundations. We understand in case of modification or replacement of members in existing structure will be paid separately as per item no. C.1 of price schedule no. 01. Please confirm.	Confirm
12	Vol - 2	Section -1, Clause 2.1.1	The scope also includes supply, delivery, installation and commissioning of Current Transformers in the AIS bays and GIS Bay (at Balaju) is required to be replaced with higher rated CT. Please Confirm Following : - 1. Replacement of higher rating current transformer in GIS Bay (at Balaju) will be done at manufacturer's premises of GIS or at site.	1. The replacement work is to be done in existing GIS which is i working condition at site. The replacement work shall be done site.



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S.N.	From	Section/Clause No.	Comment/Question of Bidder	NEA Reply
13	Vol - 2		The scope includes supply, delivery and installation of all hardware and connectors required for transmission line and replacement of existing conductors of the switchyard in the respective line bays. 1. Request you to please provide drawings of existing clamps & fittings installed in substations, if drawings are not available, please confirm, shut down will be provided for sufficient time to measure the existing fitting.	Refer above
14	Vol – 2	Section -1, Clause 2.3	The bidders are advised to visit the substation sites and acquaint themselves with the topography, infrastructure and also the design philosophy. Before proceeding with the construction work of the Sub-stations and line, the Contractor shall fully familiarize himself with the site conditions and General arrangements & scheme etc. Though the Employer shall endeavor to provide the information, it shall not be binding for the Employer to provide the same. Please Confirm Make & Country of Origin of Existing equipment's in all substation, as same would be critical to understand the work to be done in relay setting after installation of current transformers	various make of Relays installed in the substation, which includes AREVA, Siemens, Easun Reyrolle and ABB. The GIS installed at Balaju substation is of ALSTOM Make. Othe details will be provided to successful bidders.
15	Vol - 2	Section -1, Clause 2.7	The Employer shall arrange shut down of one circuit at a time and the other circuit shall be kept under charged condition. The contractor shall de-string the existing conductor and restring the circuit with the HTLS conductor section by section and restore the line in original conditions as per program finalized in co-ordination with site. 1. We understand employer will provide shutdown in such a way that, contractor's resources will be utilized to full extent and no idiling will occur due to non availability of shutdown. Please confirm 2. We understand, in case of non availability of timely shutdown, employer will compensate contractor for overheads and idiling. Please Confirm.	1. Shutdown will be provided without delaus as far as possible. 2. No compensation is envisaged.
16	Vol -2	Section -1, Clause 2.8	For the critical lines where shutdown may not be availed easily, the bidder may use the ERT system for installation of HTLS conductor. Such ERT tower will be provided by the Employer but the installation of tower and reconductoring shall be done by the Contractor without any extra cost to employer. The bidder is required to include such cost in the respective items in the BPS. 1. Kindly identify, at how many places contractor might have to use ERT and Location from where contractor has to collect & return ERT.	The ERT is envisaged to be used in Kathmandu only.

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S.N.	**From**	**Section/Clause No.**	**Comment/Question of Bidder**	**NEA Reply**
17	Vol - 3	Price Schedule No. 1, Item No. B1 & B2	Design, manufacture, testing and Supply of Disc Insulators 70 KN with fittings & Design, manufacture, testing and Supply of Disc Insulators 120 KN with fittings. 1. We Understand above mentioned items are complete set of hardware fittings (Live Side & Non Live Side) along with Insulators. Please confirm if our understanding is correct. 2. If above mentioned items are not complete set i.e. including hardware fittings, then request you to please provide quantity of hardware fittings also.	It is complete set.
18		Price Schedule No. 1, Item No. G1	All necessary accessories, hardware and fittings (Tension, suspension clamps, Connector etc.) required to complete the HTLS stringing works completely. 1. We understand these are the quantities, which are to be installed in substation only and contractor has to assess them accordingly. Please confirm. If not then request you to please quantify hardware fittings quantity to be supplied under this contract.	Refer above

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S.N.	From	Section/Clause No.	Comment/Question of Bidder	NEA Reply
19			We have quarries that the length of 132 kV transmission line is Circuit length or Conductor length? Please clarify the above point so that we proceed further & start preparation of our offer.	Total Line Length is 900 Km. Please refer PSR.

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Sr. No.	Clause No	Existing Clause	Change Requested / Clarification Requested	Remarks / Reason	NEA Reply
20	Volume II, Chapter – 04, Clause 1.16	The HTLS Conductor shall be capable of providing the Ampacity of 1100 A for ACSR Bear equivalent HTLS conductor and 12500 A for Duck Equivalent HTLS conductor, not exceeding the maximum permissible operating temperature for continuous operation of the offered HTLS Conductor and without exceeding the level of maximum permissible sag indicated at normal condition.	Please amend as follows, The HTLS Conductor shall be capable of providing the Ampacity of 1100 A for ACSR Bear equivalent HTLS conductor and 1250 A for Duck Equivalent HTLS conductor, not exceeding the maximum permissible operating temperature for continuous operation of the offered HTLS Conductor and without exceeding the level of maximum permissible sag indicated at normal condition.	Please amend typo error.	Please refer the Amendment 1 issued
21	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Clause 1.2.1	Maximum permissible Conductor sag for 447m and 300m span respectively at steady state conductor temperature and nil wind corresponding to 50 Hz alternating current of 1100 Amperes and 780 Amperes per conductor respectively under ambient conditions specified above = Not exceeding the sag for existing ACSR type of Conductor or existing sag of line, whichever is lower.	Maximum permissible Conductor sag for 447m and 300m span respectively at steady state conductor temperature and nil wind corresponding to 50 Hz alternating current of 1100 Amperes and 1250 Amperes per conductor respectively under ambient conditions specified above = Not exceeding the sag for existing ACSR type of Conductor or existing sag of line, whichever is lower.	**780 A Should be Replace by 1250 A**	Please refer the Amendment 1 issued
22	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Clause 1.2.2	The UTS of conductor at ambient temperature and maximum continuous operating temperature shall be declared in the GTP. Further, UTS of conductor achieved at maximum continuous operating temperature shall not be less than 80% of UTS at ambient temperature declared in the GTP.	Please amend as follows; The UTS of conductor at ambient temperature and maximum continuous operating temperature shall be declared in the GTP. Further, UTS of conductor achieved at maximum continuous operating temperature shall not be less than 70% of UTS at ambient temperature declared in the GTP.	Please clarify UTS value at Elevated Temperature should be limited to 70% of the UTS. Reference to UTS & Stress-Strain test at Elevated Temp.	**Please refer the Amendment 1 issued**
23	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Clause 1.3	A. For ACSR Bear Equivalent. Max allowable sag for 1100A or maximum continuous safe operational temperature for 447 m ruling span = 10m or less than the existing sag	A.For ACSR Bear Equivalent. Max allowable sag for 1100A or maximum continuous safe operational temperature for 447 m ruling span = 12.595 m at 75 deg.C or less than the existing sag	Please Clarify the Existing Sag Requirement of ACSR Bear Conductor.	The bidder is required to perfrom the survey w existing line, which includes measuring of exi sag. The HTLS conductor shall be strung cons the existing sag, and apply necessary tension v exceeding existing sag.

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Sr. No.	Clause No	Existing Clause	Change Requested / Clarification Requested	Remarks / Reason	NEA Reply
24	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Clause 1.3	C.For ACSR DUCK Equivalent. Max allowable sag for 1250A or maximum continuous safe operational temperature for 300 m ruling span = 7.30m or less than the existing sag	C.For ACSR DUCK Equivalent. Max allowable sag for 1250A or maximum continuous safe operational temperature for 300 m ruling span = 6.88 m at 75 deg.C or less than the existing sag	Please Clarify the Existing Sag Requirement of ACSR Duck Conductor.	The bidder is required to perfrom the survey w existing line, which includes measuring of exis sag. The HTLS conductor shall be strung consi the existing sag, and apply necessary tension w exceeding existing sag.
25	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Clause 1.4. Sag-Tension Requirements	Sag at designed maximum temperature (corresponding to max. specified temperature Amperes and ambient conditions specified at 1.2.1) = Lower of value of Standard sag for existing ACSR conductor for specified span @ 75DegC and measured sag of existing line @ specified span.	Sag at designed maximum temperature (corresponding to max. specified temperature Amperes and ambient conditions specified at 1.2.1) = Lower of value of Standard sag for existing ACSR Bear & ACSR Duck conductor for specified span @ 75DegC (i.e 12.595 m & 6.883 m Respectively) and measured sag of existing line @ specified span.	Please Clarify and Include the Sag Limitation Value.	Please refer above
26	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Clause 1.4. Sag-Tension Requirements	Tension at following wind pressure: - Tension at 32 deg C, full wind (166.8kg/m2) = < Tension of existing Conductor ≤ not exceeding 70% of UTS of proposed conductor	Tension at following wind pressure: - Tension at 32 deg C, full wind (166.8kg/m2) = < Tension of existing ACSR Bear Conductor (6812 Kg) ≤ not exceeding 70% of UTS of proposed conductor & = < Tension of existing ACSR Duck Conductor (5586 Kg) ≤ not exceeding 70% of UTS of proposed conductor	Please Clarify and Include the Tension Value Correspondence to Existing Conductor at 32FW.	**Please refer the Amendment 1 issued**
27	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Clause 1.6.2	Core Wires There shall be no joint of any kind in the finished wire entering into the manufacture of the strand. There shall also be no joints or splices in any length of the complete stranded core.	Please add following; There shall be no joint of any kind in the finished wire entering into the manufacture of the strand. There shall also be no joints or splices in any length of the complete stranded core. For composite core wires, during the production run, splicing of the galvanic protection barrier is allowed, provided diameter specifications are maintained.	Please refer NEA tenders, · NCB/BBP/CC/TL-076/77-02 · NCB/BBP/Re/TL-076/77-01 · KB/ICB /TL/076/77- 01 As per section 19 of ASTM B987	Please refer the Amendment 1 issued

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Sr. No.	Clause No	Existing Clause	Change Requested / Clarification Requested	Remarks / Reason	NEA Reply
28	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Clause 1.10.1	**Evaluation of Ohmic Losses & Differential Price Loading** **Average Ohmic loss (kW) = Total Length x (550)2 x Rac/1000**	To be Read as : 1. Average Ohmic loss (kW) = Total Length x (550)2 x Rac/1000 & 2. Average Ohmic loss (kW) = Total Length x (650)2 x Rac/1000. 1. Total Length: __ 2. Total Length: ____	Kindly Share the Total Length to be consider for Calculating the Average Ohmic loss (kW)	Total length as per the BPSwill be considered f respective conductor type..
29	Volume II, Chapter – 04, Clause 1.8 – Materials, Sub Clause 1.8.2 – Core,	Where composite material for core is offered, the material shall be either of High strength grade or extra high strength grade as per ASTM B987.	Please amend as follow, Where composite material for core is offered, the material shall be either of High strength grade or extra high strength grade as per ASTM B987. The offered composite core must have a non-conductive Galvanic Protection Barrier Layer.	Non conductivity Galvanic Protection Barrier Layer requirement added as per recently updated ASTM B987/B987M-20, section 3.1.5	**Please refer the Amendment 1 issued**
30	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Clause 2.1.1	c) Radio interference voltage test (dry) d) Corona extinction voltage test (dry)	~~c) Radio interference voltage test (dry)~~ ~~d) Corona extinction voltage test (dry)~~	This Test is applicable for conductor 220 kV and above.	Shall be waived if not applicable during DDE.
31	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Clause 2.1.2	Type tests specified under Clause 2.1.1 shall not be required to be carried out if a valid test certificate is available for the offered design, i.e., tests conducted earlier should have been conducted in accredited laboratory (accredited based on ISO/IEC guide 25/17025 or EN 45001 by the National Accreditation body of the country where laboratory is located) or witnessed by the representative (s) of POWERGRID or Utility.	Type tests specified under Clause 2.1.1 shall not be required to be carried out if a valid test certificate is available for the offered design, i.e., tests conducted earlier should have been conducted in accredited laboratory (accredited based on ISO/IEC guide 25/17025 or EN 45001 by the National Accreditation body of the country where laboratory is located) or witnessed by the representative (s) of POWERGRID or Utility. In the case of composite core conductors, the tests specified under Clause 2.1.1 (ii) shall be carried out before stranding on at-manufactured samples.	ASTM B987 says all test on composite core to be performed before stranding on as manufactured conditions. Please refer past NEA tenders, · NCB/BBP/CC/TL-076/77-02 · NCB/BBP/Re/TL-076/77-01 · KB/ICB /TL/076/77- 01 · ICB/PMD/MCTLP/018/19-01	**Please refer the Amendment 1 issued**
32	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Clause 2.2	2.2 Acceptance Tests t) Bending test on polymer composite core t) Galvanic Protection Barrier Layer Thickness test (on polymer composite core) As per ASTM B958	To Be Read As : 2.2 Acceptance Tests s) Bending test on polymer composite core t) Galvanic Protection Barrier Layer Thickness test (on polymer composite core) As per ASTM B987	Typographical Mistake in Sr.NO & reference Standard to be consider for Test.	**Please refer the Amendment 1 issued**

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33	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Clause 2.2	Note: All the above tests except (m) shall be carried out on Aluminium Alloy and core / core strands after stranding only	Please add follows, For composite core (i) is not applicable and (c), (g), (h), (o), (p), (t) and (u) shall be carried out before stranding. The testing and requirements listed in this specifications are based on as manufactured properties of the materials. If tests on strands or core materials are made after field exposure, the Employer and the Manufacturer should agree on the properties to be met.	ASTM B987 says all test on composite core to be performed before stranding on as manufactured conditions. Please refer past NEA tenders, · NCB/BBP/CC/TL-076/77-02 · NCB/BBP/Re/TL-076/77-01 · KB/ICB /TL/076/77- 01 · ICB/PMD/MCTLP/018/19-01	**Please refer the Amendment 1 issued**
34	Volume II, Chapter – 04, Annexure A, Clause – 1.1 UTS test on Stranded Conductor,	b) UTS Test on Stranded Conductor at elevated temperature UTS Test on Stranded Conductor shall be conducted as per clause no. 1.1(a) specified above keeping conductor temperature at the designed maximum temperature.	Please amend as follows, b) UTS Test on Stranded Conductor at elevated temperature UTS Test on Stranded Conductor shall be conducted as per clause no. 1.1(a) specified above keeping conductor temperature at the designed maximum temperature. UTS for this test shall be 70% of the UTS guaranteed in GTP.	As this test requirement was not present in following past tenders of NEA so request to remove the same or amend UTS requirement to 70%. · NCB/BBP/CC/TL-076/77-02 · NCB/BBP/Re/TL-076/77-01 · KB/ICB /TL/076/77- 01 · ICB/PMD/MCTLP/018/19-01	**Please refer the Amendment 1 issued**
				Evaluating Stress Stain behaviour at Elevated Temperature does not provide information on how the conductor will perform when operating above the conductor's thermal knee and as it approaches its maximum operating temperature. When the conductor temperature climbs above the thermal knee point all remaining tensile load on the conductor will be on the core. From this temperature and above, only the core will carry the load. Because of this, the	

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35	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Annexure-A Clause 1.5	**Stress-strain test at elevated temperature** Stress-strain test as per IEC-61089 shall be conducted keeping conductor temperature at designed maximum temperature. UTS for this test shall be 80% of the UTS guaranteed in the GTP..	Please amend as follows; Stress-strain test as per IEC-61089 shall be conducted keeping conductor temperature at designed maximum temperature. UTS for this test shall be 70% of the UTS guaranteed in the GTP..	aluminium has no influence on the high temperature sag of the conductor from the thermal knee point temperature and upward. When performing this testing at temperatures in excesses of the calculated thermal knee point, the strength of the conductor should take into account two factors: 1) The aluminium will lose potentially up to 60% of its rated strength as the test temperatures approach the maximum use temperature of the conductor. Thus, the aluminium will not carry any load until very high levels of stress when at high temperatures. 2) For the composite cores, the strength can be ~80% of the ambient strength as the test temperatures approach the conductor`s maximum use temperature. As a result of these two factors, the strength of the conductor at its maximum use temperature should be rated at 70% of the ambient strength A better alternative to adjusting the protocol is to remove the test because it does not model a situation that occurs in operation: High temperature and high loads do not occur together.	**Please refer the Amendment 1 issued**

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36	Volume II, Chapter – 04, Annexure A, Clause – 1.6 – High Temperature Endurance and Creep test	(ii)On other conductor sample, the conductor temperature shall be increased to designed maximum temperature steps of 20 deg. C and thermal elongation of the conductor sample shall be measured & recorded at each step. The temperature shall be held at each step for sufficient duration for stabilization of temperature. Further, the temperature of the conductor shall be maintained at designed maximum temperature +10 Deg. C for 1000 hours. The elongation/creep strain of the conductor during this period shall be measured and recorded at end of 1 hour, 10 hour, 100 hour and subsequently every 100 hour upto 1000 hours time period. After completion of the above, the core of the conductor sample shall be subjected to UTS test as mentioned above at clause 1.1. The conductor core shall withstand a load equivalent to 95 % of UTS. In case of polymer composite core conductor, the flexural strength & glass transition temperature of the core shall also be evaluated and the same shall not be degraded by more than 10 % over the initial value. The supplier shall plot the thermal elongation with temperature.	Please amend as follows, (ii)On other conductor sample, the conductor temperature shall be increased to designed maximum temperature steps of 20 deg. C and thermal elongation of the conductor sample shall be measured & recorded at each step. The temperature shall be held at each step for sufficient duration for stabilization of temperature. Further, the temperature of the conductor shall be maintained at designed maximum temperature (±2.5 Deg. C) for 1000 hours. The elongation/creep strain of the conductor during this period shall be measured and recorded at end of 1 hour, 10 hour, 100 hour and subsequently every 100 hour upto 1000 hours time period. After completion of the above, the core of the conductor sample shall be subjected to UTS test as mentioned above at clause1.1. The conductor core shall withstand a load equivalent to 95 % of UTS. In case of carbon-fibre-composite core conductor, the flexural strength & glass transition temperature of the core shall also be evaluated and the same shall not be degraded by more than 10 % over the value guaranteed in GTP. The supplier shall plot the thermal elongation with temperature.	Please refer past NEA tenders, · NCB/BBP/CC/TL-076/77-02 · NCB/BBP/Re/TL-076/77-01 · KB/ICB /TL/076/77- 01 · ICB/PMD/MCTLP/018/19-01 Degradation of Flexural Strength and Glass transition temperature values should be checked with respect to values specified by bidder in GTP and not with respect to initial values. Please refer past NEA tenders,	As per the specification
37	Volume II, Chapter – 04, Annexure A, Clause – 1.7 – Sheave test	The conductor sample of minimum length of 35 meter shall be tensioned at 25 % of the UTS and shall be passed through pulleys having diameter of 32 times that of the conductor with angle of 20 deg. between the pulleys. The conductor shall be passed over the pulleys 36 times a speed of 2 m/sec. After this test UTS test on the conductor shall be carried out as mentioned above at clause 1.1. In case of polymer composite core conductors, the core shall be inspected for any sign of damage or cracking through dye penetration test as per ASTM D5117 / ASTM B987 section 14. Dye penetrant exposure time shall be 30 +1/-0 minutes.	Please amend as follows, The conductor sample of minimum length of 35 meter shall be tensioned at 22 % of the UTS and shall be passed through pulleys having diameter of 32 times that of the conductor with angle of 20 deg. between the pulleys. The conductor shall be passed over the pulleys 36 times a speed of 2 m/sec. After this test UTS test on the conductor shall be carried out as mentioned above at clause 1.1. In case of polymer composite core conductors, the core shall be inspected for any sign of damage or cracking through dye penetration test as per ASTM D5117 / ASTM B987 section 14. Dye penetrant exposure time shall be 30 +1/-0 minutes.	· NCB/BBP/CC/TL-076/77-02 · NCB/BBP/Re/TL-076/77-01 · KB/ICB /TL/076/77- 01 · ICB/PMD/MCTLP/018/19-01 Installation tension is not going to be as high as initial tension hence please amend the test tension to 22%	**Please refer the Amendment 1 issued**

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Sr. No.	Clause No	Existing Clause	Change Requested / Clarification Requested	Remarks / Reason	NEA Reply
38	Volume II, Chapter – 04, Annexure A, Clause – 1.12 – Temperature Cycle Test	In case of polymer composites, the flexural strength should not degrade by more than 10 % and the Glass Transition temperature shall not degrade by more than 10 % after thermal cycling. Flexural strength shall be obtained on the basis of test procedure indicated at 1.32 below. The value of Tg after the test, shall however, in no case be less than the design maximum temperature of conductor.	Please amend as follows, In case of carbon-fibre composites, the flexural strength should not be less than 90% of the value guaranteed in GTP and the Glass Transition temperature shall not be less than 90% of the value guaranteed in GTP after thermal cycling. Flexural strength shall be obtained on the basis of test procedure indicated at 1.32 below.	Please remain requirement as per original tender clause. Degradation of Flexural Strength and Glass transition temperature values should be checked with respect to values specified by bidder in GTP and not with respect to initial values.	**Please refer the Amendment 1 issued**
39	Volume II Chapter 4 – General Technical Requirement – HTLS Conductor Annexure-A Clause 1.16 Coefficient of linear expansion for core/ core wires	**Coefficient of linear expansion for core/core strands** The temperature and elongation on a sample shall be continuously measured and recorded at interval of approximately 15 degree C from 15 degree C to designed maximum temperature corresponding to rated current(1200A)by changing the temperature by suitable means. Coefficient of linear expansion shall be determined from the measured results.	Please amend as follows; The temperature and elongation on a sample shall be continuously measured and recorded at interval of approximately 15 degree C from Laboratory Ambient Temp to designed maximum temperature corresponding to rated current (1100 A & 1250 A) by changing the temperature by suitable means. Coefficient of linear expansion shall be determined from the measured results.	Please correct test ampere from 1200A to 1100 & 1250 A and confirm the Initial/starting Temperature to be consider as laboratory ambient temperature.	**Please refer the Amendment 1 issued**

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Sr. No.	Clause No	Existing Clause	Change Requested / Clarification Requested	Remarks / Reason	NEA Reply
40	Volume II, Chapter – 04, Annexure A, Clause – 1.24 – Torsion and Elongation tests on Composite Core/INVAR core	ii) Torsion Test: The purpose of the testis to determine the resilience of the composite core to twisting and to show that after the composite core has experienced the prescribed twisting, it will not crack or have a loss in tensile strength due to the twisting. A sample length that is 170 times the diameter of the composite core being tested is mounted in the gripping fixtures. One grip shall then be fixed so that it does not twist, and the other end shall be twisted a full 360 degrees and then fixed in this position for 2 minutes. Once the twist time is completed, the core is untwisted an inspected for any crazing or other damage. If no damage is observed, the composite core is then tensile tested to failure and the final load recorded. For the test to be accepted, the composite core must withstand at least 100% of its rated tensile strength. Two samples need to be completed in order to satisfy the testing requirement.	Please amend as follows, ii) Torsion Test: The purpose of the testis to determine the resilience of the composite core to twisting and to show that after the composite core has experienced the prescribed twisting, it will not crack or have a loss in tensile strength due to the twisting. For Standard and High Strength Grade composite cores as per ASTM B987 Table 2, samples should be long enough to have a gauge length between the gripping fixtures 170 times the diameter of the composite core being tested. For core lengths less than 170 times the core OD, rotate the core to maintain the same rotation to length ratio. For Extra High Strength Grade composite core as per ASTM B987 Table 2, samples should be long enough to have a gauge length between the gripping fixtures that is 340 times the diameter of the composite core being tested. For core lengths less than 340 times the core OD, rotate the core to maintain the same rotation to length ratio. One grip shall then be fixed so that it does not twist, and the other end shall be twisted a full 360 degrees and then fixed in this position for 2 minutes. Once the twist time is completed, the core is untwisted an inspected for any crazing or other damage. If no damage is observed, the composite core is then tensile tested to failure and the final load recorded. For the test to be accepted, the composite core must withstand at least 100% of its rated tensile strength. Two samples need to be completed in order to satisfy the testing requirement.	Please refer past NEA tenders, · NCB/BBP/CC/TL-076/77-02 · NCB/BBP/Re/TL-076/77-01 Please clarify gauge length and twist degree if sample is smaller than specified gauge length.	**Please refer the Amendment 1 issued**
41	Volume II, Chapter – 04, Annexure A, Clause – 1.32	Flexural Strength Test (for carbon-fibre composite core only) Test method shall be as per ASTM D7264, ASTM D4475 or ISO 14125. The flexural strength shall not be less than the value guaranteed in the GTP	Please amend as follows, Test method shall be as per ASTM D7264, ASTM D4475 or ISO 14125. The guaranteed average minimum value before stranding shall be listed in the GTP.	Please refer past NEA tenders, · NCB/BBP/CC/TL-076/77-02 · NCB/BBP/Re/TL-076/77-01 · KB/ICB /TL/076/77- 01 The manufacturer shall state what the average minimum guaranteed value is in the GTP	As per the specification

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Sr. No.	Clause No	Existing Clause	Change Requested / Clarification Requested	Remarks / Reason	NEA Reply
42	Volume II, Chapter – 06, Annexure A, Clause 1.6	Heating Cycle Test Heating cycle test shall be performed in accordance with IS 2486 (Part-I) with following modifications: - i) Temperature of conductor during each cycle: 40 deg. C above designed maximum operating temperature of the conductor. ii) Number of cycle: 100 iii) Slip strength test shall also be carried out after heating cycle test.	Please amend as follows. Heating cycle test shall be performed in accordance with IS 2486 (Part-I) with following modifications: - i) Temperature of conductor during each cycle: 40 deg. C above designed maximum operating temperature of the conductor but not to exceed the maximum Continuous Operating temperature of the conductor. ii) Number of cycle: 100 iii) Slip strength test shall also be carried out after heating cycle test.	Please refer NEA tender, • NCB/BBP/CC/TL-076/77-02 • NCB/BBP/Re/TL-076/77-01 • KB/ICB /TL/076/77- 01 (Refer addendum) The protocol as written could force conductors to be subjected to temperatures in excess of their emergency temperatures. Please amend this protocol to ensure that the conductor is not subjected to a temperature in excess of the emergency temperature that may cause a failure of the hardware test.	As per the specification
43	Tower Schedule and KMZ for all lines			Please provide the tower schedule and KMZ files for all lines.	Attached.
44	Terrain details for all lines			Please provide the terrain details for all lines	Data not avialable.
45	ROW Scope	ROW Scope		Please clarify whether ROW is in contractor's scope or employer's scope.	The work is to be done in the existing line, so I issue may not arise.
46	Work Visa or process	Work Visa or process		If we deploy manpower & labour from India in that case where ……	Will be assisted
47	Shut Down	Shut Down		Please confirm that shut down will be available in hours basis or day basis or continuously.	Please refer PSR. The shutdown will be provid day tim, the line shall be recharged during peak hoursi.e. evening time.
48				Please clarify whether electrical license, labour license & other compulsory compliances we have to fulfil during project execution.	Yes

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Sr. No.	Clause No	Existing Clause	Change Requested / Clarification Requested	Remarks / Reason	NEA Reply
49	Vol I, Clause No. 11,Pg.16	In the case of a bid submitted by a Joint Venture, the Bid shall include a copy of the Joint Venture Agreement entered into by all partners. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful bid shall be signed by all partners and submitted with the Bid, together with a copy of the proposed agreement.		There is no JV agreement format and letter of intent format given in tender document. Please confirm the same.	The format are not part of the bid document. T bidder may submit the J/V agreement and Lett intent for J/V considering the requirement of th document.
50	Vol-II Chapter IV Annexure A	Type test reports	All the type tests should have been carried out as specified in Vol-II Chapter IV Annexure A within the last 5 years.	All the type tests should have been carried out as specified in Vol-II Chapter IV Annexure A within the last 5 years. But Type Validity Prescribed in CEA Guideline is valid for 7 years.Please clarify.	Please refer EQC
51			In order to conduct a preliminary assessment of the route, and in the view of the current constraints to immediate travel, it would be very helpful to have access to the tower schedule for the entire route(s) under consideration. May I please request you to help in providing a soft copy of the tower schedule for the lines referenced in the tender?		Will be provided if avaiable.

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Procurement of Plant for Clarifications - Design, Supply, Installation and Commissioning of 132kV Transmission Line Conductor Upgrading

ICB: PMD/EGMP/TLUP-077/78-01

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Sr. No.	Clause No	Page No.	Change Requested / Clarification Requested	Remarks / Reason	NEA Reply
52	Volume I Section 3	2_11	If the bidder submits the type test report of higher rated equipment, the bidder must provide the commitment that the type test will be performed without any extra cost to employer.	Bidder's understanding the type test for equipment will be accepted if bidder submit the type report of higher rated equipment in bidding phase with commitment that the type test for the offered technology and size of equipment will be carry out after contract awarded.	Confirmed
53				Bidder ask client to provide the existing poles structure list, and Profile drawing and existing tower drawing .	Tower span data is attached
54				Bidder ask client to provide the layout of existing GIS substation and AIS substation.	will be provided to successful bidder
55	Volume II R1 Chapter 1 -2.8	1_4	For the critical lines where shutdown may not be availed easily, the bidder may use the ERT system for installation of HTLS conductor. Such ERT tower will be provided by the Employer but the installation of tower and reconductoring shall be done by the Contractor without any extra cost to employer. The bidder is required to include such cost in the respective items in the BPS.	Bidder ask client to explain the ERT system working function.	During DDE
56	Volume II R1 Chapter 1 -2.11-X	1_3	The scope includes supply, delivery and installation of 132kV XLPE 1000 sq.mm Cu cable with all termination for termination into existing ALSTOM make GIS including all accessories complete at Balaju Substation	Bidder ask client to provide the detailed information of exsiting ALSTOM GIS, like Model Number.	will be provided to successful bidder

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ICB: PMD/EGMP/TLUP-077/78-01

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Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
57	Volume I, Section 7 - GCC	10. Employer's Responsibilities	As per Clause 10.2 The Employer shall be responsible for acquiring and providing legal and physical possession of the Site and access thereto, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way. From the above we understand that the compensation for arranging Right of way, damages during construction work in Right of way and **Temporary Access Road, Tree felling** & Compensation in Forest & Non Forest area shall be arranged by the Owner. Please Confirm.	The NEA will be respobsible for any compensation. B cost for any damages, breakages, dismantling work, temporary access road shall be in the contractor's sc No extra payment will be made. However, NEA will a the contractor for any permissions etc.
58	Volume II, Chapter-1	Project specific requirement (PSR) - Content - Annexure -I, List of drawing	Referred annexure is not available in the bidding documents. Please check and furnish the following drawings of each station which is involved under the present scope: a) Single line diagram b) Overall layout c) Control building layout d) Earthing layout e) Cable trench layout (Indoor and Outdoor)	The work involved in substation is minimum, so no drawings has been attached. Please visist the sites if required.
59	Volume II, Chapter-1	Project specific requirement (PSR)	As per Clause No. 1.2.1, Sl. No. g - with upgrading of CT, Connectors and accessories Please clarify the following regarding CT upgradation: a) Whether existing CT junction box can be reused? b) Whether existing LT cables between CT to CT junction box can be reused? c) Whether existing LT cables from junction box to Control & relay panel need to be replaced? d) Whether existing CT terminal connector can be reused? e) Whether existing connection between CT & adjacent equipment need to be replaced by new conductor or Al Tube? Else existing connection can be reused?	The cotractor can use any reuasable cable, junction boxes such as exiswting system function is not afect The existing system shall be restored to as it is cond

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Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
60	Volume II, Chapter-1	Project specific requirement (PSR)	As per Clause No. 2.1.1, Sl. No. XI. "Currently, the busbar protection at the substations are rated for 600/1A. The busbar relays used in most substations are static type. Therefore, the integration arrangement shall be provided to integrate the new HTLS line with CT into the busbar protection. The bidder is required to include all such cost in the price quoted for installation of Current Transformer and conductors". Please elaborate the scope of work regarding busbar protection augmentation.	The existing busbar protection at Pathlaiya (decentra Numerical), Chandranigahpur (Numerical), Dhalkeba (Static), Duhabi (static) required to be modified after new CT is replaced, so contractor is required to do th modification works as required.
61	Volume II, Chapter-1	Project specific requirement (PSR)	As per Clause No. 2.1.1, Sl. No. XI. Please furnish the following details of existing busbar protection of each station involved in the present scope: a) Make & model no. of busbar protection b) Type of busbar protection - Centralised or Decentralised.	Refer above
62	Volume II, Chapter-1	Project specific requirement (PSR)	As per Clause No. 4.2, Altitude above sea level: We understand that Pathlaiya, Chandranigahpur, Dhalkebar, Inerwa, Kusaha, Duhabi Substation are 440m above MSL and Balaju, Suichatar and Teku substation are 1440m above MSL. Please confirm.	Confirm

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Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
63	Volume II, Chapter-1	Project specific requirement (PSR) -	As per Clause No. 4.2 - Altitude above sea level: We understanding from referred specification, the following are the stations where the upgradation / augmentation work need to be carried out: a) Pathalaiya b) Chandranigahpur c) Dhalkebar d) Inerwa e) Kusaha f) Duhabi g) Suichatar h) Teku i) Balaju However, as per Chapter 1 – Project Specific Requirement (PSR), Clause No. 1.2.1, it is mentioned that this specification covers the execution of Upgradation of following lines: a. Suichatar - Matatirtha ~5 Km DC ACSR Bear b. Suichatar - Balaju ~4 Km SC ACSR Duck c. Suichatar - Teku ~4.5 Km DC ACSR Bear e. Pathlaiya – Dhalkebar ~102 Km DC ACSR Bear f. Kushaha Duhabi ~28 Km DC (string of this line on one Ckt) ACSR Bear As the substation locations are contradicting between above specification clauses, please check and confirm where the upgradation / augmentation work need to be	a) Pathalaiya b) Chandranigahpur c) Dhalkebar d) Inerwa (new substation under construction) e) Kusaha (Switching station, S/S under construction f) Duhabi g) Suichatar h) Teku i) Balaju j) Matatirtha
64	Volume II, Chapter-1	Project specific requirement (PSR)	As per Clause No. 7.0 Order of precedence: In case of discrepancy between price schedule, project specification requirement & Tender drawings, Please clarify the order of precedence. b) In case of discrepancy between , Vol.II, Chapter 11: Technical Data Sheet and individual technical specification, Please clarify the order of precedence	Both will supplement each other as per the site requirment, such as to sucessfully complete the scop work.
65	Volume II, Chapter-1	Project Specific Requirement (PSR)	As per Clause No. 8.0 & 9.0: Spares & Special tools - Please furnish the mandatory spare list & Special tool if required.	Tools list for HTLS conductor is attached.

Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
66	Volume II, Chapter-2	General Technical Requirement	As per Clause No.2 9.2: Type Test Report - In case of instrument transformers, the following type tests should have been conducted within 5 (five) years prior to the originally Scheduled date of bid opening. i) Lightning Impulse Test ii) Switching Impulse Test iii) Multiple Chopped Impulse Test (For CT) iv) Chopped Impulse Test (For CVT) However, as per Vol.I, Section 3 - Evaluation and Qualification Criteria, Item No. 4 - 132 kV Current Transformer, "Must submit the type test report carried out in Internationally accredited independent testing laboratory over last 7 (seven) years" In this regard, Please check and confirm the validly of type test reports.	As per the EQC.
67	Volume II, Chapter-3	General Technical Requirement, Instrument Transformer	As per referred table - 1A - Requirement of 145kV Current transformer: All relaying CTs shall be of accuracy class TPS. However, As per Vol.II, Section-11, Technical data sheet of outdoor oil filled CT & GIS type CT, accuracy class is 5P20 for protection & PS for diff / Bus. As the above clauses are contradicting, Please check and furnish the actual requirement.	The CT rating and ratio will be decided during detail engineering.
68	Volume II, Chapter-3	General Technical Requirement, Instrument Transformer	As per referred Table - 1A - Requirement of 145kV Current transformer: Accuracy class & VA burden of metering core is 0.2s and 20VA respectively. However, As per Vol.II, Section-11, Technical data sheet of outdoor oil filled CT & GIS type CT, accuracy class & VA burden are mentioned as 0.5 & 30VA respectively. As the above clauses are contradicting, please check and furnish the actual requirement.	The accuracy class and burden shall be 0.2 and 20V
69	Volume II, Chapter-3	General Technical Requirement, Instrument Transformer	As per Clause No. 3.0, Sl. No. g "For 245/145 kV class CTs, the rated extended primary current shall be 120% (or 150% if applicable) on all cores of the CTs as specified in the Chapter 1 – GTS." However, extended primary current of current transformer is not mentioned in Chapter-1. In this regard, Please check and specify the extended primary current for AIS type CT and GIS type CT.	As per the specification
70	Volume II, Chapter-3	General Technical Requirement, Instrument Transformer	As per Clause No. 6.2 (a), report for Seismic withstand shall be required for current transformer. We understand Seismic calculation & analysis report need to be submitted for NEA approval. Please confirm.	Confirm

Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
71	Volume II, Chapter-4	Annexure A		Please refer amendment 1 issued.
72	Volume II, Chapter-4	Volume II, Chapter – 04, Annexure A,	As per Clause No. 1.12 – Temperature Cycle Test: In case of polymer composites, the flexural strength should not degrade by more than 10 % and the Glass Transition temperature shall not degrade by more than 10 % after thermal cycling. Flexural strength shall be obtained on the basis of test procedure indicated at 1.32 below. The value of Tg after the test, shall however, in no case be less than the design maximum temperature of conductor. Please amend as follows, In case of carbon-fibre composites, the flexural strength should not be less than 90% of the value guaranteed in GTP and the Glass Transition temperature shall not be less than 90% of the value guaranteed in GTP after thermal cycling. Flexural strength shall be obtained on the basis of test procedure indicated at 1.32 below.	Please refer amendment 1 issued.
73	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 1.16: The HTLS Conductor shall be capable of providing the Ampacity of 1100 A for ACSR Bear equivalent HTLS conductor and **12500** A for Duck Equivalent HTLS conductor, not exceeding the maximum permissible operating temperature for continuous operation of the offered HTLS Conductor and without exceeding the level of maximum permissible sag indicated at normal condition. Request you to amed the typo error of 12500 A to 1250 A.	Please refer amendment 1 issued.

Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
74	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor Annexure-A	As per Clause No. 1.16: Coefficient of linear expansion for core/ core wires - Coefficient of linear expansion for core/core strands The temperature and elongation on a sample shall be continuously measured and recorded at interval of approximately 15 degree C from 15 degree C to designed maximum temperature corresponding to rated current(1200A)by changing the temperature by suitable means. Coefficient of linear expansion shall be determined from the measured results. Please correct test ampere from 1200A to 1100 & 1250 A and confirm the Initial/starting Temperature to be consider as laboratory ambient temperature. Please amend as follows; "The temperature and elongation on a sample shall be continuously measured and recorded at interval of approximately 15 degree C from Laboratory Ambient Temp to designed maximum temperature corresponding to rated current (1100 A & 1250 A) by changing the temperature by suitable means. Coefficient of linear expansion shall be determined from the measured results."	Please refer amendment 1 issued.
75	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 1.2.1: Maximum permissible Conductor sag for 447m and 300m span respectively at steady state conductor temperature and nil wind corresponding to 50 Hz alternating current of 1100 Amperes and **780** Amperes per conductor respectively under ambient conditions specified above = Not exceeding the sag for existing ACSR type of Conductor or existing sag of line, whichever is lower.	Please refer amendment 1 issued.
76	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 1.2.2: The UTS of conductor at ambient temperature and maximum continuous operating temperature shall be declared in the GTP. Further, UTS of conductor achieved at maximum continuous operating temperature shall not be less than 80% of UTS at ambient temperature declared in the GTP. Please clarify UTS value at Elevated Temperature should be limited to 70% of the UTS. Reference to UTS & Stress-Strain test at Elevated Temperature.	Please refer amendment 1 issued.

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Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
77	Volume II, Chapter-4	Annexure A Clause – 1.24 – Torsion and Elongation tests on Composite Core/INVAR core	ii) Torsion Test: The purpose of the testis to determine the resilience of the composite core to twisting and to show that after the composite core has experienced the prescribed twisting, it will not crack or have a loss in tensile strength due to the twisting. A sample length that is 170 times the diameter of the composite core being tested is mounted in the gripping fixtures. One grip shall then be fixed so that it does not twist, and the other end shall be twisted a full 360 degrees and then fixed in this position for 2 minutes. Once the twist time is completed, the core is untwisted an inspected for any crazing or other damage. If no damage is observed, the composite core is then tensile tested to failure and the final load recorded. For the test to be accepted, the composite core must withstand at least 100% of its rated tensile strength. Two samples need to be completed in order to satisfy the testing requirement. Please clarify gauge length and twist degree if sample is smaller than specified gauge length. Please amend as follows, ii) Torsion Test: The purpose of the testis to determine the resilience of the composite core to twisting and to show that after the composite core has experienced the prescribed twisting, it will not crack or have a loss in tensile strength due to the twisting. **For Standard and High Strength Grade composite cores as per ASTM B987 Table 2, samples should be long enough to have a gauge length between the gripping fixtures 170 times the diameter of the composite core being tested. For core lengths less than 170 times the core OD, rotate the core to maintain the same rotation to length ratio. For Extra High Strength Grade composite core as per ASTM B987 Table 2, samples should be long enough to have a gauge length between the gripping fixtures that is 340 times the diameter of the composite core being tested. For core lengths less than 340 times the core OD, rotate the core to maintain the same rotation to length ratio.** One grip shall then be fixed so that it does not twist, and the other end shall	Please refer amendment 1 issued.
78	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 1.3: A.For ACSR Bear Equivalent. Max allowable sag for 1100A or maximum continuous safe operational temperature for 447 m ruling span = 10m or less than the existing sag Max allowable sag for 1100A or maximum continuous safe operational temperature for 447 m ruling span = 12.595 m at 75 deg.C or less than the existing sag. Please Clarify the Existing Sag Requirement of ACSR Bear Conductor.	Please refer amendment 1 issued.

Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
79	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 1.3: C.For ACSR DUCK Equivalent. Max allowable sag for 1250A or maximum continuous safe operational temperature for 300 m ruling span = 7.30m or less than the existing sag Max allowable sag for 1250A or maximum continuous safe operational temperature for 300 m ruling span = 6.88 m at 75 deg.C or less than the existing sag. Please Clarify the Existing Sag Requirement of ACSR Duck Conductor.	Please refer amendment 1 issued.
80	Volume II, Chapter-4	Annexure A Clause – 1.32	Flexural Strength Test (for carbon-fibre composite core only) Test method shall be as per ASTM D7264, ASTM D4475 or ISO 14125. The flexural strength shall not be less than the value guaranteed in the GTP The manufacturer shall state what the average minimum guaranteed value is in the GTP Please amend as follows, "Test method shall be as per ASTM D7264, ASTM D4475 or ISO 14125. The guaranteed average minimum value before stranding shall be listed in the GTP".	Please refer amendment 1 issued.
81	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 1.4: Sag-Tension Requirements - Sag at designed maximum temperature (corresponding to max. specified temperature Amperes and ambient conditions specified at 1.2.1) = Lower of value of Standard sag for existing ACSR conductor for specified span @ 75DegC and measured sag of existing line @ specified span. ACSR Bear & ACSR Duck conductor for specified span @ 75DegC (i.e 12.595 m & 6.883 m Respectively) and measured sag of existing line @ specified span. Please Clarify and Include the Sag Limitation Value.	Please refer amendment 1 issued.
82	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 1.4: Sag-Tension Requirements - Tension at following wind pressure: Tension at 32 deg C, full wind (166.8kg/m2) = < Tension of existing Conductor ≤ not exceeding 70% of UTS of proposed conductor. Please Clarify and Include the Tension Value Correspondence to Existing Conductor at 32FW. Tension at following wind pressure: Tension at 32 deg C, full wind (166.8kg/m2) = < Tension of existing ACSR Bear Conductor (6812 Kg) ≤ not exceeding 70% of UTS of proposed conductor & = < Tension of existing ACSR Duck Conductor (5586 Kg) ≤ not exceeding 70% of UTS of proposed conductor	Please refer amendment 1 issued.

Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
83	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor Annexure-A	As per Clause No. 1.5: Stress-strain test at elevated temperature - Stress-strain test as per IEC-61089 shall be conducted keeping conductor temperature at designed maximum temperature. UTS for this test shall be 80% of the UTS guaranteed in the GTP. Please amend as follows; "Stress-strain test as per IEC-61089 shall be conducted keeping conductor temperature at designed maximum temperature. UTS for this test shall be 70% of the UTS guaranteed in the GTP". Evaluating Stress Stain behaviour at Elevated Temperature does not provide information on how the conductor will perform when operating above the conductor's thermal knee and as it approaches its maximum operating temperature. When the conductor temperature climbs above the thermal knee point all remaining tensile load on the conductor will be on the core. From this temperature and above, only the core will carry the load. Because of this, the aluminium has no influence on the high temperature sag of the conductor from the thermal knee point temperature and upward. When performing this testing at temperatures in excesses of the calculated thermal knee point, the strength of the conductor should take into account two factors: 1) The aluminium will lose potentially up to 60% of its rated strength as the test temperatures approach the maximum use temperature of the conductor. Thus, the aluminium will not carry any load until very high levels of stress when at high temperatures. 2) For the composite cores, the strength can be ~80% of the ambient strength as the test temperatures approach the conductor's maximum use temperature. As a result of these two factors, the strength of the conductor at its maximum use temperature should be rated at 70% of the ambient strength. A better alternative to adjusting the protocol is to remove the test because it does not model a situation that occurs in operation: High temperature and high loads do not occur together.	Please refer amendment 1 issued.

Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
84	Volume II, Chapter-4	Annexure A	As per Clause No. 1.6: High Temperature Endurance and Creep test (ii) On other conductor sample, the conductor temperature shall be increased to designed maximum temperature steps of 20 deg. C and thermal elongation of the conductor sample shall be measured & recorded at each step. The temperature shall be held at each step for sufficient duration for stabilization of temperature. Further, the temperature of the conductor shall be maintained at designed maximum temperature +10 Deg. C for 1000 hours. The elongation/creep strain of the conductor during this period shall be measured and recorded at end of 1 hour, 10 hour, 100 hour and subsequently every 100 hour upto 1000 hours time period. After completion of the above, the core of the conductor sample shall be subjected to UTS test as mentioned above at clause 1.1. The conductor core shall withstand a load equivalent to 95 % of UTS. In case of polymer composite core conductor, the flexural strength & glass transition temperature of the core shall also be evaluated and the same shall not be degraded by more than 10 % over the initial value. The supplier shall plot the thermal elongation with temperature. Degradation of Flexural Strength and Glass transition temperature values should be checked with respect to values specified by bidder in GTP and not with respect to initial values. Please amend as follows, "(ii) On other conductor sample, the conductor temperature shall be increased to designed maximum temperature steps of 20 deg. C and thermal elongation of the conductor sample shall be measured & recorded at each step. The temperature shall be held at each step for sufficient duration for stabilization of temperature. Further, the temperature of the conductor shall be maintained at designed maximum temperature (**±2.5 Deg. C**) for 1000 hours. The elongation/creep strain of the conductor during this period shall be measured and recorded at end of 1 hour, 10 hour, 100 hour and subsequently every 100 hour upto 1000 hours time period. After completion of the above, the core of the conductor sample shall be	Please refer amendment 1 issued.
85	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 1.6.2: Sag-Tension Requirements - Core Wires There shall be no joint of any kind in the finished wire entering into the manufacture of the strand. There shall also be no joints or splices in any length of the complete stranded core. For composite core wires, during the production run, splicing of the galvanic protection barrier is allowed, provided diameter specifications are maintained. Kindly Clarify	Please refer amendment 1 issued.

Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
86	Volume II, Chapter-4	Annexure A	As per Clause No. 1.7: Sheave test - The conductor sample of minimum length of 35 meter shall be tensioned at **25%** of the UTS and shall be passed through pulleys having diameter of 32 times that of the conductor with angle of 20 deg. between the pulleys. The conductor shall be passed over the pulleys 36 times a speed of 2 m/sec. After this test UTS test on the conductor shall be carried out as mentioned above at clause 1.1. In case of polymer composite core conductors, the core shall be inspected for any sign of damage or cracking through dye penetration test as per ASTM D5117 / ASTM B987 section 14. Dye penetrant exposure time shall be 30 +1/-0 minutes. Installation tension is not going to be as high as initial tension hence please amend the test tension to 22%	Please refer amendment 1 issued.
87	Volume II, Chapter-4	Clause No. 1.8 – Materials	As per Clause No. 1.8 – Materials, Sub Clause 1.8.2 – Core - Where composite material for core is offered, the material shall be either of High strength grade or extra high strength grade as per ASTM B987. Non conductivity Galvanic Protection Barrier Layer requirement added as per recently updated ASTM B987/B987M-20, section 3.1.5 Please amend as follow: Where composite material for core is offered, the material shall be either of High strength grade or extra high strength grade as per ASTM B987. The offered composite core must have a non-conductive Galvanic Protection Barrier Layer	Please refer amendment 1 issued.
88	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 1.10.1: Evaluation of Ohmic Losses & Differential Price Loading Average Ohmic loss (kW) = Total Length x (550)2 x Rac/1000 Kindly Share the Total Length to be consider for Calculating the Average Ohmic loss (kW). 1.Average Ohmic loss (kW) = Total Length x (550)2 x Rac/1000 & 2.Average Ohmic loss (kW) = Total Length x (650)2 x Rac/1000.	Refer previous reply above.
89	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 2.1.1 c) Radio interference voltage test (dry) d) Corona extinction voltage test (dry) This Test is applicable for conductor 220 kV and above. Kindly amend the clause as per requirement.	Refer previous reply above.

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Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
90	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 2.1.2: Type tests specified under Clause 2.1.1 shall not be required to be carried out if a valid test certificate is available for the offered design, i.e., tests conducted earlier should have been conducted in accredited laboratory (accredited based on ISO/IEC guide 25/17025 or EN 45001 by the National Accreditation body of the country where laboratory is located) or witnessed by the representative (s) of POWERGRID or Utility. ASTM B987 says all test on composite core to be performed before stranding on as manufactured conditions. In the case of composite core conductors, the tests specified under Clause 2.1.1 (ii) shall be carried out before stranding on at-manufactured samples. Please Clarify.	Please refer amendment 1 issued.
91	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 2.2: Acceptance Tests t) Bending test on polymer composite core t) Galvanic Protection Barrier Layer Thickness test (on polymer composite core) As per ASTM B958 Kindly amend the typographical error in Sr. No. & reference Standard to be consider for Test. 2.2 Acceptance Tests **s)** Bending test on polymer composite core t) Galvanic Protection Barrier Layer Thickness test (on polymer composite core) As per ASTM **B987**	Please refer amendment 1 issued.
92	Volume II, Chapter-4	General Technical Requirement – HTLS Conductor	As per Clause No. 2.2: Note: All the above tests except (m) shall be carried out on Aluminium Alloy and core / core strands after stranding only. ASTM B987 says all test on composite core to be performed before stranding on as manufactured conditions. For composite core (i) is not applicable and (c), (g), (h), (o), (p), (t) and (u) shall be carried out before stranding. The testing and requirements listed in this specifications are based on as manufactured properties of the materials. If tests on strands or core materials are made after field exposure, the Employer and the Manufacturer should agree on the properties to be met. Kindly amend.	Please refer amendment 1 issued.

Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
93	Volume II, Chapter-6	Annexure A Clause 1.6	Heating Cycle Test: Heating cycle test shall be performed in accordance with IS 2486 (Part-I) with following modifications: - i) Temperature of conductor during each cycle: 40 deg. C above designed maximum operating temperature of the conductor. ii) Number of cycle: 100 iii) Slip strength test shall also be carried out after heating cycle test. The protocol as written could force conductors to be subjected to temperatures in excess of their emergency temperatures. Please amend this protocol to ensure that the conductor is not subjected to a temperature in excess of the emergency temperature that may cause a failure of the hardware test. Please amend as follows. **Heating cycle test shall be performed in accordance with IS 2486 (Part-I) with following modifications: -** **i) Temperature of conductor during each cycle: 40 deg. C above designed maximum operating temperature of the conductor but not to exceed the maximum Continuous Operating temperature of the conductor.** **ii) Number of cycle: 100** **iii) Slip strength test shall also be carried out after heating cycle test**	Please refer amendment 1 issued.

Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
94	Volume II, Chapter-6	Annexure A Clause 2.1 (b)	Heating Cycle Test: Heating cycle test shall be performed in accordance with IS 2121 (Part-II-1981) with following modifications: - i) Temperature of conductor during each cycle: 40 deg. C above designed maximum operating temperature of the conductor. ii) Number of cycle: 100 iii) Slip strength test shall also be carried out after heating cycle test. Testing requirement and procedure are in line with Sr. No. 23 hence changes considered for sr. no. 23 are applicable for this clause also. The protocol as written could force conductors to be subjected to temperatures in excess of their emergency temperatures. Please amend this protocol to ensure that the conductor is not subjected to a temperature in excess of the emergency temperature that may cause a failure of the hardware test. Please amend as follows, **"Heating cycle test shall be performed in accordance with IS 2121 (Part-II-1981) with following modifications: -** **i) Temperature of conductor during each cycle: 40 deg. C above designed maximum operating temperature of the conductor but not to exceed the maximum Continuous Operating temperature of the conductor.** **ii) Number of cycle: 100** **iii) Slip strength test shall also be carried out after heating cycle test".**	As per the specification
95	Volume II, Chapter-10	General Technical Requirement – EHV Cable	As per Clause No. 1.8: Conductor - The shape of conductor shall be compacted segmental having high compactness and smooth surface finish. However, as per IEC 60228, Table-1, conductor shape shall be circular upto 1000 Sqmm cable. In this regard, please check and issue the suitable amendment for conductor shape of 132kV, 1000 Sqmm cable.	Shall be as per IEC

Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
96	Volume II, Chapter-10	General Technical Requirement – EHV Cable,	As per Clause No. 1.12 - Radial Moisture Barrier & Clause No. 1.13 - Metallic screen a) As per the referred specification clauses, corrugated aluminium is mentioned for both Radial moisture barrier & Metallic screen. We understand that both these layers are one and the same. Please confirm. b) We are not envisaging any metallic screening by concentric layer of plain copper wire (if required) to meet short time current requirement, followed by an open helix of copper. Short circuit requirement shall be meet by Corrugated aluminium sheath. Please confirm. c) Please furnish the required earth fault current & its duration that need to be withstood by the Metallic sheath/screen.	As per the specification. During DDE
97	Volume II, Chapter-10	General Technical Requirement – EHV Cable	As per Clause No. 1.12: Radial Moisture Barrier - extruded corrugated aluminium sheath is mentioned. In this regard, we propose seam welded corrugated aluminium sheath which is acceptable by all utilities. Please confirm acceptance.	As per the specification. During DDE
98	Volume II, Chapter-10	General Technical Requirement – EHV Cable	As per Clause No.2 - Trefoil/ Flat formation: Please check and confirm whether 132kV cable shall be laid in trefoil formation or flat formation.	As per the site condition
99	Volume II, Chapter-10	General Technical Requirement – EHV Cable	As per Clause No. 9 - Bonding of screen/Sheath: Cross-bonding is mentioned for sheath bonding. As the cables are of shorter length within the substation plot, we request NEA to accept Single point bonding. Please confirm.	To be decided during DDE
100	Volume II, Chapter-10	General Technical Requirement – EHV Cable	Kindly provide installation conditions such as: a) Installation in trench (in free air) / underground b) Depth of laying c) Type of formation : Trefoil / flat d) Ground temperature e) Ambient air temperature f) Soil Thermal resistivity	As per the site condition
101	Volume II, Chapter-10	General Technical Requirement – EHV Cable	a) Please specify the continuous current requirement (if any) for the EHV cables used for 132kV lines. b) We presume 1run per phase shal be considered. Please confirm.	To be decided during DDE. Shall be suitable as per t rating of HTLS conductor.
102	Volume III, Schedule No.1:	Plant and Equipment including Mandatory Spares to be supplied from abroad	In Price Schedule No.1: Item No. B.1 & B.2, we understand Tension and Suspension fitting Unit should be in Sets and Disc Insulator in Numbers. We request to provide Disc Insulator in Numbers as separate item as bidders needs to assess the quantity after award of contract.	As per the BPS

Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
103	Volume III, Schedule No.1:	Plant and Equipment including Mandatory Spares to be supplied from abroad	In Price Schedule No.1: Item No. D - Current transformer, Quantity of 132 kV, 3 Phase, 5 Core Current Transformer with all accessories as per Technical Specification is 122 nos. In this regard, we request NEA to furnish the station-wise break-up of CT quantity.	Please quote as per the BPS
104	Volume III, Schedule No.1:	Plant and Equipment including Mandatory Spares to be supplied from abroad	In Price Schedule No.1: Item No. G.1 mentioned that Tension, Suspension Clamps, Connector etc to be quoted in Lotwise. Request you to provide Tower Schedule of all existing lines to work out the clamps required.	Please quote as per the BPS
105	Volume III, Schedule No.1:	Plant and Equipment including Mandatory Spares to be supplied from abroad	In Price Schedule No.1: Item No. G.3 mentioned that All tools and tackles for installation of HTLS conductor - Whether 4 Ton winch machine and 5 meter Sag Bridge is to be supplied? It would be better if list if tools required is provided.	Refer attached list
106	Volume III, Schedule No.1:	Plant and Equipment including Mandatory Spares to be supplied from abroad	In Price Schedule No.1: Item No. G - Erection Hardware, Item No. 2 - Twenty (20) percent spare parts equivalent in cost of all necessary accessories, hardware & fittings of item no. H.1 a) As per referred item, we understand that 20% spare shall be provided for item no. G.1 instead of H.1. Please check and issue suitable amendments. b) We understand that item no. H.1 is pertaining to erection hardware requirement (if any) which shall be used inside the substation. Please confirm.	Please read H.1 as G.1 in the BPS. The erection hardware mentioned in the BPS G.1 is f necessary accessories, hardware and fittings (Tensio suspension clamps, Connector etc) required to comp the HTLS stringing works completely including any it required inside of the switchyard.
107	Volume III, Schedule No.1:	Plant and Equipment including Mandatory Spares to be supplied from abroad	In Price Schedule No.1: Item No. H: As the scope of this package is only CT upgradation, we are not envisaging following works in the present scope: a) Illumination b) Cable trays & supports c) PVC/GI pipes d) Buried trench e) Earth wire If required, Please specify the station wise scope of work with necessary quantities.	Confirm
108	Volume III, Schedule No.1:	Plant and Equipment including Mandatory Spares to be supplied from abroad	In Price Schedule No.1: Item No. H - Erection Hardware Please clarify whether 132kV EHV cable shall be directly buried or laid in the cable trench? If 132kV cable trench shall be laid in the cable trench, Whether the same shall be laid in the existing trench or new trench is required?	EHV Cable shall be laid as per the site condition. If n trench is required, it shall be designed and constrcut by the contractor.

Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
109	Volume III, Schedule No.1:	Plant and Equipment including Mandatory Spares to be supplied from abroad	In Price Schedule No.1: Item No. I: a) Please clarify whether existing earthing riser of CT can be reused? b) We are not envisaging any lightning protection under present scope as all stations are existing. For any specific requirement regarding lightning protection, please specify and add a separate line item (station-wise) in the BoQ along with necessary quantities.	1. Existing Earthing risers can be reused, if suitable. 2. Confirm.
110	Volume III, Schedule No.1:	Plant and Equipment including Mandatory Spares to be supplied from abroad	In Price Schedule No.1: Item No. J: Power & Control Cable - PVC (1.1kV grade), Voltage grade of LT power & control cable shall be 1.1kV. However, as per technical specification, Chapter 6 – General Technical Requirement – Power and Control Cable, Clause No. 1.1.2, The PVC (70°C) insulated power cables shall be of FR type, C1 category, conforming to IEC: 60502 (Part-I). However, as per IEC 60502 (Part-1), Cable rated voltage is 1kV. In this regard, Please check and confirm the Voltage grade of LT cables.	As per the BPS.
111	Volume III, Schedule No.1:	Plant and Equipment including Mandatory Spares to be supplied from abroad	In Price Schedule No.1: Item No. K: 132kV 1000 Sq.mm Cu XLPE Cable with termination for connection from existing AIS system to existing GIS complete with earthing and other accessories. Tentative length required 60m. As per referred item, 132kV cable route length is mentioned as 60m. In this regard, if the same is increased/decreased during detail engineering based on site condition, the same shall be paid on actual length basis. Please confirm.	The length mention is minimum and tentative. Pleas visit the site for detail. No extra payment will be mad
112	Volume III, Schedule No.1:	Plant and Equipment including Mandatory Spares to be supplied from abroad	In Price Schedule No.1: Item No. K, 132kV GIS type cable termination shall be provided. In this regard, interface & scope split between GIS Manufacturer & EHV cable termination Manufacturer shall be as per IEC 62271-209. Please confirm.	The contractor shall provide the termination arrange for both end of the cable.
113	General		We are not envisaging following works in the any station involved in the present scope: a) Augmentation/ Upgradation of substation automation system b) Augmentation/ Upgradation of Control & relay panel c) Augmentation/ Upgradation of RTU d) Augmentation/ Upgradation of LT switchgear e) Relay setting calculation f) Augmentation/ Upgradation of existing Busbar protection	Relay setting and busbar protection modification wor required.

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Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
114	General	Applicable for AIS Station: List of stations where work need to be carried out	As per our understanding from specification, the following are the stations where the upgradation / augmentation work need to be carried out: a) Pathalaiya b) Chandranigahpur c) Dhalkebar d) Inerwa e) Kusaha f) Duhabi g) Suichatar h) Teku i) Matatirtha j) Balaju Please Confirm.	Confirm. Refer clarification above
115	General	Applicable for AIS Station: Altitude above sea level	As per technical specification, an altitude of 400m from MSL for all terai substation & 1440m for substations in kathmandu has been mentioned. In this regard, please specify the altitude of each substation location.	The altitute generally is as per PSR
116	General	Applicable for AIS Station: Equipment connection	Please provide the following details: a) Equipment bus type- Rigid (or) Flexible b) Equipment bus Conductor type & cross-section (Eg. ACSR Moose, Bear etc.) c) Equipment bus Conductor configuration- Single/Twin/Quad d) Height of Equipment bus	Please visit the site for detail. The busbar type outsid kathmandu is generally rigid. The bus conductor shal kathmandu varies from bear. Zebra or Duck.
117	General	Applicable for AIS Station: Station-wise CT quantity	Please provide the following details: a) Station wise quantity of the Current transformers which need to be replaced under this package. b) Bays at which the replacement to be done to be identified station-wise c) Photograph of the Name plate details for each existing CT which need to be replaced	Refer clarification above
118	General	Applicable for AIS Station: Earthing	Please provide the following details: a) Earthing conductor size b) Material of Earthing conductor (Copper or MS or GI) c) Earth mat spacing	Only the risers needs to be provided. The conductor s shall not be lessthan 120 Sq.mm., Copper.
119	General	Applicable for AIS Station: Cable trench Details	Please provide the following details: a) Whether cable trench is available with sufficiet space from Control room to the Bay where CT need to be replaced? b) Please furnish photograph of typical cable trench cross-section c) Check for details such as Number of tiers & Width of tray	Please visit the site for detail

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Sl. No.	Document Volume / Section & Page No.	Reference Clause/ Heading	Bidders Query	Reply (NEA)
120	General	Applicable for AIS Station: Type, Make & model no. of existing facilities	Please furnish the following details of existing system: a) Type of 132kV Busbar protection - Centralised or De-centralised c) Make & model no. of 132kV Busbar protection d) Whether station is RTU based or Substation automation system e) Make & model no. of existing substation automation system or RTU (as applicable)	Refer above
121	General	Applicable for AIS Station: Dismantling	Kindly confirm whether any dismantling scope is involved in the proposed substation plot	If any dismantling work is required, the bidder shall include such cost in their respective bid price. The co shall include restoration work, as required.
122	General	Applicable for AIS Station: Shut down sequence	Kindly confirm whether any specific shut down sequence to be followed.	During detail engineering and implementation
123	General	Applicable for GIS Station - Balaju: Earthing	Please provide the following details: a) Earthing conductor size b) Material of Earthing conductor (Copper or MS or GI) c) Earth mat spacing	Refer above
124	General	Applicable for GIS Station - Balaju: 132kV EHV cable	As per scope of work, 132kV, 1000 Sqmm, EHV cable shall be provided from existing AIS system to existing GIS. In this regard, Please confirm the following: a) Where the EHV cable need to be terminated? b) Distance between the GIS bay & the existing AIS system/Gantry (In BPS tentative route length is mentioned as 60m)	The cable shall be laid from existing terminatin gantr and structure upto the GIS. Please visit the site for details.
125	General	Applicable for GIS Station - Balaju: Existing 132kV EHV cable (If available)	As the project scope is upgradation work, please confirm whether any 132kV cable of lesser size had already been installed from the identified GIS Bay up to the line terminal gantry. If available, please furnish the following details: a) The existing cable is laid in trench with supports/trays (or) diret buried? b) Photograph of the existing trench required c) Whether the existing 132kV cable along with termination & accessories need to be dismantled?	The new cable is to replace existing cable. Th dismanlting cost shall be included with the cost.

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ANNEXURE: List of Tools and tackles for HTLS stringing

The minimum items required for Tools and tackle are described below. The tonnage and quantity mentioned is minimum, the bidder is required to provide the calculation and documents during DDE. The bidder may propose critical equipment required for installation & commissioning:

1)	HYDRAULIC PRESS PORTABLE TYPE 100 MT CAPACITY WITH 50 M HOSE PIPE_	1NOS
2)	DIES AND PUNCH SET SUITABLE TO THE SIZE OF CONDUCTOR	.... 1 SET
3)	HYDRAULIC CUTER	.... 2 NOS
4)	CORE RETAINER FOR CONDUCTOR AS APPLICABLE	... 3 NOS
5)	MANUAL SAGGING WINCH	...1 NOS
6)	SINGLE SHEAVE PULLY	... 4 NOS
7)	FOUR SHEAVE PULLEYS	... 6 NOS
8)	PP ROPE 20 MM 200 MTS	... 10 BUNDLES
9)	LIN PULLING SWIVEL JOINT 8 MT	... 6 NOS
10)	CHAIN HOIST 5MT	...2 NOS
11)	COLORED CELLO TAPE	...12 REELS
12)	ALLEN WRENCH ET	...2 NOS
13)	RING SPANNER SIZE 16 TO 30/32	...2EACH
14)	CONDUCTOR LIFTING HOOK	...4 NOS
15)	RUNNING BLOCKS 660 MM	... 15 NOS
16)	STEEL SLINGS DIFFERENT SIZE (12 MM TO 18 MM) LENGTH	600 M EACH
17)	SAFETY HELMETS	... 10 NOS
18)	SAFETY GLOVES	... 10 PAIRS
19)	SAFETY SHOES	...10 PAIRS
20)	ELECTRICAL RESISTANCE GLOVES	... 10 SETS
21)	MOBILE FALL ARRESTORS	... 6 SETS
22)	PLATFORM LADDERS 4 MTR	... 2 NOS
23)	GROUNDED ROLLER ARRAY STRINGING BLOCK (S&R)	... 8 NOS
24)	FRICTION TAPE	... 12 REELS.

NEPAL ELECTRICITY AUTHORITY

Duhabi Grid Branch, Duhabi, Sunsari

TOWER DETAILS OF 132 kV TRANSMISSION LINE FROM DUHABI S/S TO RUPANI S/S

S.No.	From	To (Tower No.)	Distance (K.M.)		Added Span (Mtr.)	Span between	Deviation of Tower	Type of Tower	Remarks
1	Duhabi s/s Gantry	838	0.06		60	Gantry-838		DD	Duhabi
2		837	0.26	200	200	838-837	40° -46' -00" RT	DD	
3		836	0.56	300	300	837-836		DA	
4		835	0.88	320	320	836-835		DA	
5		834	1.19	310	310	835-834		DA	
6		833	1.5	310	310	834-833		DA	
7		832	1.824	324	324	833-832	22° -00' -00" RT	DC	
8		831	2.138	314	314	832-831	29° -00' -00" RT	DC	
9		830	2.446	308	308	831-830		DA	
10		829	2.766	320	320	830-829		DA	
11		828	3.096	330	330	829-828		DA	
12		827	3.426	330	330	828-827		DA	
13		826	3.736	310	310	827-826		DA+4(LE+3)	
14		825	4.096	360	360	826-825		DA	
15		824	4.436	340	340	825-824		DA	
16		823	4.756	320	320	824-823		DA	
17		822	5.086	330	330	823-822		DA	
18		821	5.416	330	330	822-821		DA	
19		820	5.726	310	310	821-820		DA	
20		819	6.046	320	320	820-819	8° -28' -00" LT	DB	
21		818	6.398	352	352	819-818		DA+4(LE+3)	
22		817	6.771	373	373	818-817		DA+4(LE+3)	
23		816	7.121	350	350	817-816		DA	
24		815	7.481	360	360	816-815		DA+4(LE+3)	
25		814	7.831	350	350	815-814		DA	
26		813	8.171	340	340	814-813		DA+4(LE+3)	
27		812	8.511	340	340	813-812		DA	
28		811	8.831	320	320	812-811		DA	
29		810	9.161	330	330	811-810		DA	
30		809	9.491	330	330	810-809	7° -18' -00" LT	DB	
31		808	9.836	345	345	809-808		DA	
32		807	10.186	350	350	808-807		DA+6	
33		806	10.566	380	380	807-806		DA	
34		805	10.896	330	330	806-805		DA	
35		804	11.216	320	320	805-804		DA	
36		803	11.536	320	320	804-803		DA	
37		802	11.866	330	330	803-802		DB	
38		801	12.196	330	330	802-801		DA	
39		800	12.546	350	350	801-800		DA+4(LE+3)	
40		799	12.896	350	350	800-799		DA	
41		798	13.226	330	330	799-798		DA	
42		797	13.526	300	300	798-797		DA	
43		796	13.846	320	320	797-796		DB	
44		795	14.206	360	360	796-795		DA+4(LE+3)	
45		794	14.506	300	300	795-794		DA	
46		793	14.872	366	366	794-793		DA+6	
47		792	15.226	354	354	793-792		DA	
48		791	15.536	310	310	792-791		DA	
49		790	15.886	350	350	791-790		DA+4(LE+3)	
50		789	16.196	310	310	790-789		DA	
51		788	16.536	340	340	789-788		DA+4(LE+3)	
52		787	16.876	340	340	788-787		DA	
53		786	17.196	320	320	787-786		DB	

54		785	17.526	330	330	786-85		DA	
55		784	17.856	330	330	785-784		DA	
56		783	18.186	330	330	784-783		DA	
57		782	18.526	340	340	783-782		DA+4(LE+3)	
58		781	18.876	350	350	782-781		DA	
59		780	19.196	320	320	781-780		DA	
60		779	19.516	320	320	780-779		DA	
61		778	19.846	330	330	779-778		DA	
62		777	20.166	320	320	778-777		DA	
63		776	20.496	330	330	777-776	20° -43' -00" LT	DC	
64		775	20.886	390	390	776-775		DA+6	
65		774	21.296	410	410	775-774		DA+4(LE+3)	
66		773	21.626	330	330	774-773		DA	
67		772	21.946	320	320	773-772	14° -20' -00" LT	DB	
68		771	22.241	295	295	772-771		DA	
69		770	22.531	290	290	771-770	19° -20' -00" LT	DC	
70		769	22.854	323	323	770-769		DA	
71		768	23.166	312	312	769-768		DA	
72		767	23.494	328	328	768-767		DA	
73		766	23.824	330	330	767-766		DA	
74		765	24.149	325	325	766-765		DA	
75		764	24.474	325	325	765-764		DA	
76		763	24.799	325	325	764-763		DA	
77		762	25.124	325	325	763-762		DA	
78		761	25.447	323	323	762-761		DA	
79		760	25.809	362	362	761-760		DA+4(LE+3)	
80		759	26.112	303	303	760-759	12° -51' -00" RT	DB	
81		758	26.392	280	280	759-758		DA	
82		757	26.692	300	300	758-757	19° -52' -00" RT	DD	
83		756	27.172	480	480	757-756		LDA	
84		755	27.984	812	812	756-755		LDA	
85		754	28.796	812	812	755-754		LDA	
86		753	29.608	812	812	754-753		LDA	
87		752	30.42	812	812	753-752		LDA	
88		751	31.232	812	812	752-751		LDA	
89		750	32.044	812	812	751-750		LDA	
90		749	32.834	790	790	750-749		LDA	
91		748	33.624	790	790	749-748		LDA	
92		747	34.414	790	790	748-747		LDA	Kushaha ??
93		746	35.204	790	790	747-746		LDA	Check
94		745	35.767	563	563	746-745	30° -06' -00" RT	DD+4(LE+3)	
95		744	36.15	383	383	745-744	1° -11' -00" RT	DB+6	
96		743	36.565	415	415	744-743		DA+4(LE+3)	
97		742	36.925	360	360	743-742		DA	
98		741	37.255	330	330	742-741		DA	
99		740	37.585	330	330	741-740		DA	
100		739	37.895	310	310	740-739	13° -26' -00" RT	DD	
101		738	38.264	369	369	739-738		DA+6	
102		737	38.654	390	390	738-737	54° -51' -30" LT	DD	
103		736	38.951	297	297	737-736		DA	
104		735	39.251	300	300	736-735		DA	
105		734	39.551	300	300	735-734		DA+6	
106		733	39.931	380	380	734-733		DA	
107		732	40.231	300	300	733-732		DA	
108		731	40.631	400	400	732-731		DA+6	
109		730	41.061	430	430	731-730	8° -55' -00" LT	DC+6	
110		729	41.386	325	325	730-729		DA	
111		728	41.726	340	340	729-728		DA	
112		727	42.026	300	300	728-727	1° -58' -00" LT	DA	
113		726	42.356	330	330	727-726	31° -26' -00" RT	DD+4(LE+3)	

114		725	42.888	532	532	726-725		LDA	
115		724	43.366	478	478	725-724		DA+6	
116		723	43.776	410	410	724-723		DA+6	
117		722	44.206	430	430	723-722		DA+6	
118		721	44.656	450	450	722-721		DA+6	
119		720	45.066	410	410	721-720		DA+6	
120		719	45.456	390	390	720-719		DA	
121		718	45.776	320	320	719-718		DA	
122		717	46.106	330	330	718-717		DB	
123		716	46.436	330	330	717-716		DA	
124		715	46.696	260	260	716-715		DA+6	
125		714	47.106	410	410	715-714		DA	
126		713	47.436	330	330	714-713		DA	
127		712	47.686	250	250	713-712		DA	
128		711	48.008	322	322	712-711		DA	
129		710	48.338	330	330	711-710		DC+4(LE+3)	
130		709	48.848	510	510	710-709		LDA	
131		708	49.668	820	820	709-708		LDA	
132		707	50.068	400	400	708-707		DA+6	
133		706	50.308	240	240	707-706	18° -50' -00" RT	DC	
134		705	50.664	356	356	706-705		DA+4(LE+3)	
135		704	51.004	340	340	705-704		DA	
136		703	51.344	340	340	704-703		DA	
137		702	51.684	340	340	703-702		DA+4(LE+3)	
138		701	52.034	350	350	702-701		DA	
139		700	52.364	330	330	701-700		DA	
140		699	52.668	304	304	700-699		DA	
141		698	53.034	366	366	699-698		DA	
142		697	53.354	320	320	698-697		DA	
143		696	53.614	260	260	697-696		DA	
144		695	53.954	340	340	696-695	15° -24' -00" LT	DC	
145		694	54.287	333	333	695-694		DA	
146		693	54.617	330	330	694-693		DA+4(LE+3)	
147		692	54.987	370	370	693-692		DA	
148		691	55.247	260	260	692-691		DA	
149		690	55.537	290	290	691-690		DA	
150		689	55.857	320	320	690-689		DA	
151		688	56.182	325	325	689-688		DA	
152		687	56.477	295	295	688-687		DA	
153		686	56.797	320	320	687-686		DA	
154		685	57.107	310	310	686-685		DA	
155		684	57.437	330	330	685-684	13° -20' -00" LT	DB	
156		683	57.747	310	310	684-683		DA	
157		682	58.047	300	300	683-682		DA	
158		681	58.387	340	340	682-681		DA	
159		680	58.747	360	360	681-680		DA+4(LE+3)	
160		679	59.077	330	330	680-679		DA	
161		678	59.377	300	300	679-678		DA+4(LE+3)	
162		677	59.707	330	330	678-677	4° -58' -00" LT	DB	Rupni
		TOTAL			59707 Mtr.				

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Tower Schedule of 132 kV Hetauda-Dhalkebar Transmission Line

S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
	Gantry				
		70			Hetauda Substation
1	1				
		300			
2	2				
		270			
3	3				
		117			
4	4				
		193.5			
5	5				
100	100				
		380			Pathlaiya ???
101	101				CHECK
		390			
102	102				
		360			
103	103				
		330			
104	104				
		320			
105	105				
		350			
106	106				
		370			
107	107				
		330			
108	108				
		340			
109	109				
		330			
110	110				
		330			
111	111				
		330			
112	112				
		360			
113	113				
		400			
114	114				
		430			
115	115				
		420			
116	116				
		300			
117	117				
		233.66			
118	118				

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Tower Schedule of 132 kV Hetauda-Dhalkebar Transmission Line

S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
		340			
119	119				
		320			
120	120				
		340			
121	121				
		320			
122	122				
		320			
123	123				
		324			
124	124				
		346			
125	125				
		310			
126	126				
		330			
127	127				
		290			
128	128				
		299			
129	129				
		350			
130	130				
		400			
131	131				
		350			
132	132				
		315			
133	133				
		365			
134	134				
		364			
135	135				
		336			
136	136				
		350			
137	137				
		345			
138	138				
		330			
139	139				
		310			
140	140				
		320			
141	141				
		380			
142	142				
		408			
143	143				

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Tower Schedule of 132 kV Hetauda-Dhalkebar Transmission Line

S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
		302			
144	144				
		300			
145	145				
		250			
146	146				
		440			
147	147				
		350			
148	148				
		320			
149	149				
		340			
150	150				
		300			
151	151				
		290.82			
152	152				
		334			
153	153				
		320			
154	154				
		340			
155	155				
		356			
156	156				
		385			
157	157				
		405			
158	158				
		356			
159	159				
		328			
160	160				
		322			
161	161				
		354			
162	162				
		318.14			
163	163				
		336			
164	164				
		314			
165	165				
		316			
166	166				
		312			
167	167				
		342			
168	168				

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Tower Schedule of 132 kV Hetauda-Dhalkebar Transmission Line

S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
		310			
169	169				
		384			
170	170				
		446			
171	171				
		416			
172	172				
		392			
173	173				
		364			
174	174				
		320			
175	175				
		290			
176	176				
		330			
177	177				
		370			
178	178				
		360			
179	179				
		320			
180	180				
		384			
181	181				
		346			
182	182				
		270			
183	183				
		370			
184	184				
		424			
185	185				
		386			
186	186				
		330			
187	187				
		310			
188	188				
		330			
189	189				
		320			
190	190				
		330			
191	191				
		340			
192	192				
		310			
193	193				

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Tower Schedule of 132 kV Hetauda-Dhalkebar Transmission Line

S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
		310			
194	194				
		320			
195	195				
		370			
196	196				
		310			
197	197				
		330			
198	198				
		310			
199	199				
		320			
200	200				
		310			
201	201				
		333			
202	202				
		400			
203	203				
		391.5			
204	204				
		340			
205	205				
		320			
206	206				
		330			
207	207				
		336			
208	208				
		356			
209	209				
		344			
210	210				
		305			
211	211				
		385			
212	212				
		400			
213	213				
		370			
214	214				
		330			
215	215				
		320			
216	216				
		310			
217	217				
		320			
218	218				

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Tower Schedule of 132 kV Hetauda-Dhalkebar Transmission Line

S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
		323			
219	219				
		330			
220	220				
		320			
221	221				
		320			
222	222				
		320			
223	223				
		320			
224	224				
		320			
225	225				
		350			
226	226				
		371			
227	227				
		340			
228	228				
		330			
229	229				
		340			
230	230				
		330			
231	231				
		326			
232	232				
		298			
233	233				
		404			
234	234				
		420			
235	235				
		400			
236	236				
		330			
237	237				
		310			
238	238				
		346			
239	239				
		334			
240	240				
		330			
241	241				
		320			
242	242				
		310			
243	243				

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Tower Schedule of 132 kV Hetauda-Dhalkebar Transmission Line

S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
		281			
244	244				
		320			
245	245				
		340			
246	246				
		350			
247	247				
		372			
248	248				
		550			
249	249				
		384			
250	250				
		300			
251	251				
		334			
252	252				
		306			
253	253				
		295			
254	254				
		290			
255	255				
		330			
256	256				
		320			
257	257				
		306			
258	258				
		314			
259	259				
		320			
260	260				
		260			
261	261				
		280			
262	262				
		270			
263	263				
		240			
264	264				
		300			
265	265				
		275			
266	266				
		340			
267	267				
		320			
268	268				

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Tower Schedule of 132 kV Hetauda-Dhalkebar Transmission Line

S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
		330			
269	269				
		290			
270	270				
		287			
271	271				
		390			
272	272				
		390			
273	273				
		325			
274	274				
		330			
275	275				
		370			
276	276				
		340			
277	277				
		340			
278	278				
		330			
279	279				
		325			
280	280				
		330			
281	281				
		330			
282	282				
		360			
283	283				
		440			
284	284				
		201			
285	285				
		380			
286	286				
		390			
287	287				
		350			
288	288				
		397			
289	289				
		360			
290	290				
		310			
291	291				
		320			
292	292				
		360			
293	293				

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Tower Schedule of 132 kV Hetauda-Dhalkebar Transmission Line

S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
		388			
294	294				
		326			
295	295				
		334			
296	296				
		322			
297	297				
		320			
298	298				
		322			
299	299				
		322			
300	300				
		362			
301	301				
		357			
302	302				
		330			
303	303				
		320			
304	304				
		317			
305	305				
		350			
306	306				
		357			
307	307				
		336			
308	308				
		340			
309	309				
		320			
310	310				
		340			
311	311				
		320			
312	312				
		310			
313	313				
		300			
314	314				
		349			
315	315				
		320			
316	316				
		334			
317	317				
		340			
318	318				

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S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
		320			
319	319				
		340			
320	320				
		320			
321	321				
		320			
322	322				
		280			
323	323				
		315			
324	324				
		395			
325	325				
		375			
326	326				
		326			
327	327				
		330			
328	328				
		325			
329	329				
		325			
330	330				
		320			
331	331				
		395			
332	332				
		380			
333	333				
		320			
334	334				
		335			
335	335				
		325			
336	336				
		335			
337	337				
		365			
338	338				
		366			
339	339				
		310			
340	340				
		365			
341	341				
		320			
342	342				
		315			
343	343				

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S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
		375			
344	344				
		310			
345	345				
		325			
346	346				
		325			
347	347				
		330			
348	348				
		323			
349	349				
		310			
350	350				
		310			
351	351				
		328			
352	352				
		380			
353	353				
		385			
354	354				
		325			
355	355				
		345			
356	356				
		352			
357	357				
		300			
358	358				
		280			
359	359				
		280.5			
360	360				
		320			
361	361				
		330			
362	362				
		344			
363	363				
		335			
364	364				
		350			
365	365				
		350			
366	366				
		310			
367	367				
		310			
368	368				

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Tower Schedule of 132 kV Hetauda-Dhalkebar Transmission Line

S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
		315			
369	369				
		305			
370	370				
		305			
371	371				
		306			
372	372				
		330			
373	373				
		330			
374	374				
		325			
375	375				
		290			
376	376				
		345			
377	377				
		360			
378	378				
		265			
379	379				
		315			
380	380				
		310			
381	381				
		325			
382	382				
		353			
383	383				
		341			
384	384				
		331			
385	385				
		320			
386	386				
		310			
387	387				
		320			
388	388				
		310			
389	389				
		290			
390	390				
		478			
391	391				
		330			
392	392				
		258			
393	393				

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Tower Schedule of 132 kV Hetauda-Dhalkebar Transmission Line

S.No.	Tower No.	Span(Meter)	Tower Type	Angle of Deviation	Remarks
		352			
394	394				
		330			
395	395				
		300			
396	396				
		310			
397	397				
		320			
398	398				
		340			
399	399				
		352			
400	400				
		428			
401	401				
		190			
402	402				
		400			
403	403				
		248			
404	404				
		340			
405	405				
		334			
406	406				
		336			
407	407				
		260			
408	408				
		290			
409	409				
		302			
410	410				
		300			
411	411				
		310			
412	412				
		380			
413	413				
		400			
414	414				
		351.5			
415	415				
		35			
	Gantry	137575.12			**Dhalkebar Substation**

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