SCOPE OF WORK
FOR

Diversion of 132kV Khurda- Mendhsal SC line (HTLS Conductor) from Loc No.112 to 117 and diversion of 220kV Mendhasal- Atri DC line from Loc no-520 to 528 due to shifting of existing location no-524 by Monopole tower for proposed corrider of Khurda bypass road on NH- 57:

(a) Type of Tower & Line: Type: ~~Lattice~~ or Monopole 220KV & D/C or S/C Line with D/C Tower.

(b) Line Length: - Route Km.

(c) Detail location of Line: Origin: **132 KV Khurda –Mendhasal SC line from Loc no-112 to 117**

220 KV Atri-Mendhasal DC line from Loc no-520 to 528

(d) Nos. of Tower: (i) Tangent: 0Nos.~~(ii~~) Angle: 8 Nos~~.~~

(e) Type of Structure: Hot Dip Galvanised -Mild Steel (HT & Non-HT)

(f) Type of Insulator: Long Rod or Disc (Antifog/Non-Antifog): Porcelain or Composite.

(g) Conductor: ACSR ZEBRA ~~or AAAC--------- or~~ HTLS

(h) Earth wire: ~~OPGW~~ or ~~HDG MS Earth wire~~.

1.0 General Information:

Purpose of the project: The proposed Transmission line shall connect between --------- & ---------- Grid Sub-station or required for line diversion from ------ location to ------ location (at------(name of the village/town). This shall improve the power quality in and around Angul area. This project will be beneficial to the public as well as industrial Hubs of Dhenkanal & Angul area and will help in development of this region of Odisha State. The project has been approved by BoD, OPTCL, OERC & Govt. of Odisha.

Construction of 220kV Transmission Line (Name:----------)or Diversion of -------- KV Transmission Line (Name:----------), **Diversion of 132kV Khurda- Mendhsal SC line (HTLS Conductor) from Loc No.112 to 117 and diversion of 220kV Mendhasal- Atri DC line from Loc no-520 to 528 due to shifting of existing location no-524 by Monopole tower for proposed corrider of Khurda bypass road on NH- 57** including supply of towers, conductor, Porcelain-long rod/composite insulators, earth wire/ OPGW, hardware & associated accessories, destringing/ dismantling works (if required), etc. associated with for diversion /shifting of various Transmission Lines infringing, ROW solving, obtaining Forest clearances(if required), making tower foundation, tower erection, conductor stringing and other related works for construction of Transmission line on turnkey basis. Site and other details are as per below Table-1.0:

TABLE-1.0

Name of Transmission Line	**Line Length**	**S/C Line or D/C Line**	**No. of tower**	**Type of towers**	**In case of Diversion: Location of Tower**	**Type of Conductor & its Stringing (in Kms)**	**Work supervision by OPTCL officials: Name of: Sub-Division----: Division----: Circle----: Zone----**

132 KV Khurda-Mendhasal line	3.085 Route KM	**SC line**				**ACCC HTLS conductor**	**Sub-Division: Khurda Division-: Khurda Circle: Bhubaneswar Zone: Central zone**
220 KV Atri-Mendhasal line	2.462 Route KM	**SC line**				**ACSR Zebra conductor**	**Sub-Division: Mendhasal Division-: Mendhasal Circle: Bhubaneswar Zone: Central zone**

2.0 Engineer-In-Charge (EIC):

A. DGM, EHT(O&M) Division, **Mendhasal, Khurda**

B. ----------

3.0 Scope of Work: PACKAGE 18/2024-25:

Engineering, Supply, Erection, Testing & Commissioning Diversion of 132kV Khurda- Mendhsal SC line (HTLS Conductor) from Loc No.112 to 117 and diversion of 220kV Mendhasal- Atri DC line from Loc no-520 to 528 due to shifting of existing location no-524 by Monopole tower for proposed corrider of Khurda bypass road on NH-57 on turnkey contract basis in Khurda District.

~~The indicative layout diagram & SLD of the proposed sub-station & associated transmission line are enclosed *in the drawing folder in Vol-II*~~. The works are to be carried out on **EPC/Turnkey CONTRACT BASIS** till final completion of line, its testing, commissioning and handing over the same to the owner.

The scope of the work includes:-

(**i**) Bidders are requested to visit the site before quoting the bid. The scope of work is not limiting to the respective bidding proposal sheet (BPS, Price schedule).

(ii) In Case any work, which is not included in the BPS, but required for completion of project, to be decided as per the terms and conditions of the Standard Bid Document (SBD).

(iii) Design, engineering, manufacture, supply, erection, testing & commissioning of all equipment ~~for substation~~, construction of Transmission line & associated system, as detailed in the specifications and schedule of quantities and in subsequent. ~~An indicative SLD of the substation has been provided in the technical specification which may be followed as a basis for finalization of the substation structural layout in consultation with OPTCL~~.

(v) Execution of all civil works as per schedule for erection of ~~Tower column (S/S~~), Tower(Line), equipment foundation(S/S), ~~construction of earth mat, cable trench, drainage system, Fencing etc~~.

(vi) Erection, testing, commissioning of ~~all equipment and handing over of the substation and~~ transmission line complete in all respect as per approved scheme and to the satisfaction of the Employer including statutory inspection.

(vii) The makes of the equipment/components/materials shall be from valid OPTCL approve vendor list indicated in this tender and to be approved by the employer before placement of the order on the vendor/manufacturer.

(viii) The contractor(s) shall arrange power supply for construction of the project. The expenditure for such arrangement till completion of the project shall be to the contractor(s) account.

(ix) The contractor(s) shall arrange clean water for construction and curing to the civil works.

(x) The work as mentioned in the price schedule shall be considered for the evaluation of the bid.

(xi) The contractor shall arrange for security of all the materials including owner supply materials (handed over to him) that are required for successful completion of the project till final handing over of the entire work to OPTCL.

(xii) Contractor has to obtain Project License in respect of the projects from the Secretary, Electrical Licensing Board of Orissa at his own cost, prior to commencement of works.

(xiii) The contractor shall supply one official copy of each **Standard** listed in the appropriate schedule.

The contractor shall be fully responsible for providing all equipment, material, systems and services which are required to complete the construction and successful commissioning of the works in all respects**.** The Contractor shall also refer to the Technical Specification (Vol.-II), for proper understanding of the works involved in respect of each substation.

2.0 BRIEF SCOPE OF WORK:-

The scope of work on EPC/Turnkey CONTRACT BASIS includes design, engineering, manufacture, type testing, (factory testing) supply on FOR destination site basis, transportation, handling, storage at site, erection, site testing, commissioning complete in all respects and maintenance of plant and equipment until handing over of works in accordance with Conditions of Contract and the stipulations under various chapters of this specification at the prices stated in the Price Schedule for the following.

PACKAGE 18/2024-25:

Engineering, Supply, Erection, Testing & Commissioning Diversion of 132kV Khurda- Mendhsal SC line (HTLS Conductor) from Loc No.112 to 117 and diversion of 220kV Mendhasal- Atri DC line from Loc no-520 to 528 due to shifting of existing location no-524 by Monopole tower for proposed corrider of Khurda bypass road on NH-57 on turnkey contract basis in Khurda District.

i)	Supply of all equipment & materials for ~~the sub-station (Bay Extension) and~~ transmission line.
ii)	Detailed design of the ~~sub-station(Bay Extension) &~~ transmission line.
iii)	Providing engineering data and drawings, as per specified format, for employer's review, approval and records.
iv)	Complete Manufacturing including Type, Acceptance & Routine testing, as specified & as per IEC/IS standard.
v)	Packing and transportation from the manufacturer's works to the site including transit insurance & customs clearance/ port clearance (if required), port handling, clearance for imported goods and further loading (if applicable)" As delivered at site basis"
vi)	Receipt, Unloading, Storage, Insurance and Preservation of Sub-station & Transmission Line equipment, material & accessories etc at site.
vii)	Execution of all civil works as per schedule for erection of ~~Tower column (S/S),~~ Tower(Line), ~~equipment foundation(S/S), construction of earth mat, cable trench, drainage system, Firefighting system, Fencing etc~~.

viii)	Erection, testing, commissioning of all equipment ~~and handing over of the substation (Bay Extension)~~ and transmission line complete in all respect as per approved scheme and to the satisfaction of the Employer including statutory inspection.
ix)	**Name of the work: Engineering, Supply, Erection, Testing & Commissioning for Diversion of 132kV Khurda- Mendhsal SC line (HTLS Conductor) from Loc No.112 to 117 and diversion of 220kV Mendhasal- Atri DC line from Loc no-520 to 528 due to shifting of existing location no-524 by Monopole tower for proposed corrider of Khurda bypass road on NH- 57 on turnkey contract basis in Khurda District**. **A) Details of Provisions to be kept in the Sub-station are as follows: (NA)**
x)	**Name of the work: Engineering, Supply, Erection, Testing & Commissioning for Diversion of 132kV Khurda- Mendhsal SC line (HTLS Conductor) from Loc No.112 to 117 and diversion of 220kV Mendhasal- Atri DC line from Loc no-520 to 528 due to shifting of existing location no-524 by Monopole tower for proposed corrider of Khurda bypass road on NH- 57 on turnkey contract basis in Khurda District** **B) Details of Provisions to be kept in the Transmission Line are as follows:** **(1)** **Stringing of 132 KV SC line with HTLS conductor: 3.085 Route KM** Dismantling of existing ACSR Panther Conductor with hardware fittings in 132KV transmission line – 3.085 Route Kms **Stringing of 220 KV DC line with ACSR Zebra conductor: 2.462 Route KM** Dismantling of existing ACSR Zebra Conductor with hardware fittings in 132KV transmission line – 2.462 Route Kms (**2**) **Design, manufacturing, testing & Supply of HTLS (ACCC Casa Blanca) conductor** as well as required associated hardware fittings and accessories viz. suspension clamps, Tension clamps, dead end clamps, mid-span compression joints, repair sleeves, T-Connectors, vibration dampers, etc **as per BOQ**. (3) Survey & profiling of existing line route using Total stations, verification of availability of statutory electrical clearances using PLS-CADD software; de-stringing of existing Conductor including dismantling of associated fittings & accessories from the above lines and stringing of each circuit with HTLS conductor along with associated fittings and accessories. **(4)** The standard type insulators (90/120/160 KN) of the existing line shall be used for re-conductoring of line with HTLS conductor. **(4)** Stringing of HTLS conductor, in the existing transmission line, as per spec. (5) The ACSR Panther conductor removed from the existing line is envisaged for re-use/ utilization by the Owner in other projects. Proper handling and safety of the conductor during de-stringing, storage at site, measurement of conductor lengths, rewinding on drums at site and safe transportation to Owners designated stores is included in the scope of work. (6) The Owner 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. **Shut down will be allowed form 5 AM to 5 PM on**

	daily basis for the replacement work. The contractor has to do the stringing within this interval so that line can be charged at 5 PM every day. However the guaranteed shut down period for each day is eight hours. (7) Appropriate safety measures along with necessary safety tools and equipment to carry out de stringing and stringing operations under the above conditions including mechanical/ structural safety of the towers, shall be the responsibility of the contractor. Necessary calculations shall be carried out by the contractor to ensure that by replacing the existing ACSR Panther conductor with the HTLS conductor offered, the loadings on the towers due to conductor tensions as well as loads on account of the re-conductoring activities shall be within specified limits. These calculations shall be submitted by the bidder along with bid. The calculations will be checked by PLS CADD soft ware, if found wrong the bid will be rejected. (8) The materials covered in this package shall be supplied complete in all respects, including all components, fittings and accessories which are necessary or are usual for their efficient performance and satisfactory maintenance under the various operating and atmospheric conditions. Such parts shall be deemed to be within the scope of the Contract, whether specifically included or not in the Specification or in the Contract Schedules. The Supplier shall not be eligible for any extra charges for such fittings, etc **(9) Settlement of all issues related to right of Way & responsibilities of acquiring Right of Way (ROW) lies with contractor at his risk and cost**. **(10) Responsibilities of getting clearance from Railway (if applicable), NHAI (if applicable), Forest (if applicable), Water and other Statutory/Govt. bodies lie with the contractor at his risk and cost (except payment of statutory fees).** **(11)** Testing and commissioning of Transmission Line & accessories. **(12)** Handing over of the completed system to the Owner including materials reconciliation with closure proposal.
xii)	~~**OPGW SYSTEM**~~: ~~(1) Supply, Installation, testing & commissioning of OPGW related equipment and materials as per specification & price schedule. The link shall be as per the SLD enclosed.~~ ~~(2) Testing and commissioning of OPGW system~~.
xiii)	**Following scope of activities against obtaining Forest Clearances are highlighted**: (a) Getting Permission for Survey from Forest Authorities and Collection of Coordinates from ORSAC and submission of both soft copy & hard copy of Forest Diversion Proposal Map to concerned DFO and DFO office will forward the same to ORSAC for verification and validation. Certification of Map of forest land by representative of different departments as per statutory requirements of Odisha Government is to be submitted in 06sets of hard copy and one soft copy and a separate map to this effect duly certified by representatives of different departments as per statutory requirements of Odisha Government is to be submitted in 6sets of hard copy & one soft copy. (b) Documentation and E-filing of FC application (Form-A, Part-I). (c) Field Verification report of DFOs (Form A, Part-II). (d) Inspection report by RCCF (Form-A, Part-III). (e) Recommendation by Nodal officer (FC Act, O/o PCCF (Form-A, Part-IV).

	(f) Recommendations and submission for forest Clearance by State Forest and Environment Dept. to MoEF, Govt. of Odisha (Form-A, Part-V). (g) Stage-I Clearance (With conditions) by MoEF, GOI (Form-A, Part-VI). (h) Complying the stipulations of stage-I clearance). (i) Stage-II clearance by MoEF, GOI. **However any other activities other than above required for obtaining Forest clearance are also to be considered.**
xiv)	**Time is the essence of the contract. All the work as indicated in the Price Schedule shall be in the PERT Chart for approval by the authority at the beginning of contract.** Satisfactory conclusion of the Contract.

Note:

i. The aforesaid scope of work is only indicative.
ii. The detailed scope of package(s) / works is given in Volume-II
iii. The detailed BOQ (Bill of Quantity) is given in the Price schedule.

4.0 Special Requirement of works:

4.1 Supply of materials required for construction / diversion works shall be ensured within stipulated time as per the program from the date of LOA. BOMs, Structural drawings, Shop drawings of Transmission Line Tower shall be supplied by the contractor. The contractor shall be fully responsible for Supply and services as per Technical Specifications attached in bid.

4.2 It shall be safe to use crane of suitable capacity for erection of towers to optimize the shutdown period of TL therefore, all expenditure related to hiring of crane, transportation etc. shall be included in the erection price and no extra payment shall be made for the same.

4.3 Use of tractor for final sagging shall not be permitted. The Contractor shall use power operated hydraulic/ motorized winch machines or and Tension puller. At least 02 power winch machines shall be deployed at every location.

4.4 De-stringing & dismantling of existing Transmission Line towers which infringe the corridor of modified TL shall be dismantled during shutdown within time schedule as given. Enough skilled manpower shall be deployed by the contractor to execute the work within time schedule. 02 Nos erection gangs (each gang of 35-40 skilled person) shall be deployed for erection of towers during shut down period (At each site) and 01 No. Stringing gang shall be deployed to complete the stringing of Conductor /Earth wire/OPGW (at each Site).

4.5 Testing and commissioning of the erected transmission lines: The contractor is liable to conduct Tower Footing Resistance (TFR) measurement of each location, accordingly the TFR testing kit (shall be taken back by the contractor once the measurement work is completed) shall be arranged by the contractor without any additional cost to OPTCL. Thermo vision scanning of modified parts shall be carried out by OPTCL according to maintenance guideline, if any fault observed the same shall be attended by contractor during defect liability period.

4.6 The scope of works includes stringing/de-stringing of conductor, earth wire & or OPGW, erection/removal of hardware fittings, insulators, conductor, earth wire & or OPGW accessories, etc. and erection/dismantling of towers of ---------kV line. Loading,

transportation & unloading of transmission line materials from the designated store to the site suitably so that the damage can be prevented.

4.7 Contractor should plan their execution and resources so that new/diversion works of Transmission Lines shall be completed within the stipulated period as below;

Construction of New/diversion of Transmission Line	**Work completion Period**
Name: Engineering, Supply, Erection, Testing & Commissioning of High Temperature Low Sag (HTLS) Conductor after dismantling of ACSR Panther Conductor in existing 132 KV Choudwar-Bidanasi SC line up to Loc no-118 to 91 and Loc no-23 to 01 in Cuttack District on Turnkey contract basis	Within 07 Month
Name:---------	Within -------

In case of line diversion work, the Employer shall arrange shut down of charged section of existing transmission lines, if required, before carrying out de-stringing & dismantling works as per program finalized in co-ordination with site. The contractor shall erect the towers under existing TL corridor up to safe distance, as decided by the OPTCL official thereafter, shutdown shall be availed. Shutdown shall be for a limited period therefore proper planning in consultation with OPTCL shall be required.

4.8 Appropriate safety measures along with necessary safety tools and equipment to carry out stringing and destringing operations under the above conditions including mechanical/ structural safety of the towers shall be the responsibility of the contractor. The entire quantity of dismantled line materials viz. tower parts, conductor, earth wire, OPGW, hardware fittings, insulators and conductor, earth wire & OPGW accessories removed from the existing line shall be transported to the designated nearest OPTCL store by the contractor at his own cost. The Bidder shall submit his offer taking into consideration of all those aspects, which are necessary to meet the requirement.

4.9 Erection contractor is required to return the empty steel drums of conductor, OPGW and earth wire to OPTCL designated store. All balance material if any as per the contract shall be handed over to OPTCL in good condition.

4.10 On completion of all physical work, inspection shall be carried out by designated electrical inspector of Govt. of Odisha. The contract shall be liable to comply all observations raised during inspection. OPTCL will assist whenever responsibility of owner exists. All required documents shall be furnished by contractor during such inspection of CEI.

4.11 The contractor shall be responsible to secure compliance with all Central & State Government laws as well as rules, regulations, Bye-laws and other of the local authorities and statutory bodies as may be in force from time to time as applicable. The agency shall also be responsible for giving the required notice to any statutory or local bodies as required by law and obtain all requisite license / permission as applicable to the agency for carrying out the work envisaged in the contract. OPTCL shall bear no liability whatsoever towards any violations by the agency in this regard.

4.12 The agency shall comply with all labour laws applicable to workmen engaged by them for carrying out the work and OPTCL shall bear no liability whatsoever towards any violations by the agency in this regard. Detailed instructions on compliance to some of these labour laws are enumerated in the ensuing paragraphs.

4.13 Other items not specifically mentioned in this Specification and/or BPS but are required for the successful commissioning of the transmission line, unless specifically excluded in the Specification to be considered.

4.14 **Completion of Work**: The work under this contract shall be completed within 09 (in word-Nine) month from the date of LOA. L2 network shall be submitted within ------ month from the date of LOA.

4.15 The responsibilities of acquiring Right of Way (ROW) for transmission line (tower foundation, tower erection & stringing of conductors etc.) corridor lies with the contractor. Whereas, the Contractor shall be responsible for securing, for getting clearances from Railway, NHAI, Forest, Water, and other Govt./Statutory bodies. All statutory fees for getting clearance shall be to OPTCL's account against documentary evidence.

4.16 It is the responsibility of the contractor to strictly adhere the procedure as required for obtaining clearances from Railway, NHAI, Forest, Water, and other Govt./Statutory bodies etc.

5.0 Electrical Clearances

5.1 Ground Clearance

The minimum ground clearance from the bottom conductor shall not be less than **18000 mm for 765 KV**, **8840 mm for 400KV**, **7015 mm for 220KV** and **6100 mm for 132KV** lines at the maximum sag conditions i.e. at max temperature as indicated in tower spotting data and still air.

a) An allowance of 150mm shall be provided to account for errors in stringing.

b) Conductor creep shall be compensated by over tensioning the conductor suitably to meet the requirement.

5.2 Clearance between lines crossing each other shall be kept in accordance with the CEA (Measures Relating to Safety and Electric Supply) Regulations, 2010 as amended up-to-date. In order to reduce the height of the crossing towers, it may be advantageous to remove the ground-wire of the line to be crossed (if this is possible and permitted by the Employer of the line to be crossed).

Following scope of activities against obtaining Forest Clearances are highlighted:

(j) Getting Permission for Survey from Forest Authorities and Collection of Coordinates from ORSAC and submission of both soft copy & hard copy of Forest Diversion Proposal Map to concerned DFO and DFO office will forward the same to ORSAC for verification and validation. Certification of Map of forest land by representative of different departments as per statutory requirements of Odisha Government is to be submitted in 06sets of hard copy and one soft copy and a separate map to this effect duly certified by representatives of different departments as per statutory requirements of Odisha Government is to be submitted in 6sets of hard copy & one soft copy.

(k) Documentation and E-filing of FC application (Form-A, Part-I).

(l) Field Verification report of DFOs (Form A, Part-II).

(m) Inspection report by RCCF (Form-A, Part-III).

(n) Recommendation by Nodal officer (FC Act, O/o PCCF (Form-A, Part-IV).

(o) Recommendations and submission for forest Clearance by State Forest and Environment Dept. to MoEF, Govt. of Odisha (Form-A, Part-V).

(p) Stage-I Clearance (With conditions) by MoEF, GOI (Form-A, Part-VI).

(q) Complying the stipulations of stage-I clearance).

(r) Stage-II clearance by MoEF, GOI.

However any other activities other than above required for obtaining Forest clearance are also to be considered