



Bihar Grid

Bihar Grid Company Limited
(BGCL)

Petition

For

**Prior Regulatory Approval of the Hon'ble Commission
for Work wise & Scheme wise Capital Investment Plan
and Capitalization**

Submitted to

Bihar Electricity Regulatory Commission

**Submitted by,
Bihar Grid Company Limited (BGCL)**

2nd Floor, Alankar Place,

**Boring Road,
Patna -800 001**

21th May 2026

Before the Hon'ble Bihar Electricity Regulatory Commission,

Patna, Bihar

Filing No.:

Case No.:

IN THE MATTER OF:

Filing of the Petition for the prior approval of Work wise & Scheme wise Capital Investment Plan and Capitalization under BERC (Procedure for filing Capital investment and Capitalisation plan) Regulations, 2018 & compliance with the directions issued by the Hon'ble BERC vide Tariff Order dated 18th March 2026 under Case No. 54 of 2025 along with the other guidelines and directions issued by the Hon'ble BERC from time to time and under the Electricity Act, 2003 read with the relevant guidelines.

AND

IN THE MATTER OF THE APPLICANT

Bihar Grid Company Limited (herein after referred to as 'BGCL' or 'The Petitioner'), which shall mean for the purpose of this Petition the Licensee, having its registered office at 2nd Floor, Alankar Place, Boring Road, Patna -800 001.

The Petitioner respectfully submits as under:

1. Bihar Grid Company Limited (hereinafter referred to as “BGCL” or “the Petitioner”) is responsible for ensuring the development of an efficient, coordinated, and economical system of intra-State transmission lines for the smooth flow of electricity from generating stations to load centres and for providing non-discriminatory open access as required. Further, BGCL undertakes such other functions as may be assigned to the Company by law or by the Government/Government Authority concerning the operation of the power system. The Company derives its revenue through recovery of transmission charges from transmission system users. BGCL is primarily engaged in the business of transmission of electricity and is vested with the transmission assets, interests in property, rights, and liabilities. The Company acts as a Transmission Licensee under the provisions of Section 14 of the Electricity Act, 2003.
2. The Hon'ble Commission (hereinafter referred to as “BERC”) notified the Bihar Electricity Regulatory Commission (Procedure for Filing Capital Investment and Capitalisation Plan) Regulations, 2018 on 13th July 2018. The aforesaid Regulations specifies the procedure to be followed by the Transmission Licensee to obtain the necessary prior approval of the Hon'ble Commission on the works to be taken up under Capital Investment Plan.
3. Regulation 6.2 of BERC (Procedure for filing Capital investment and Capitalisation plan) Regulations, 2018 provides for submission of Capital investment Plan every year with the ARR/Multi-year ARR Petition, as reproduced below:

“6.2 The Licensee(s) shall submit the Capital investment Plan every year with the ARR/Multi-year ARR petition and it should inter-alia contain:-

(a) Scheme wise Source wise actual capital expenditure and capitalization for previous year vis-a-vis projected in the investment plan for that year;

(b) Scheme wise Source wise actual capital expenditure and capitalization for first six months of current year vis-à-vis projected in the investment plan for that period;

(c) Scheme wise Source wise capital investment plan containing year wise schedule of capital expenditure and capitalization for next ten years starting from ensuing years. Based on actual expenditure and capitalization the rolling plan may get revised in subsequent filings. The capital investment plan should show scheme wise objective of the investment.

Provided that such capital investment plan seeking regulatory approval shall be supported with Detailed Project Report (DPR) duly approved by the competent authority.

Provided further that if DPR duly approved by the competent authority is not available till finalization of the capital investment plan, the licensee(s) may include such investment in the capital investment plan as mentioned above. However the licensee shall submit the approved DPR to the Commission in its immediate next filing following approval of such DPR.

Provided also that the Capital investment (made out of internally generated fund) for which no DPR is prepared shall also be a part of capital investment plan as mentioned above. However the licensee shall submit such statement/report to substantiate the purpose and nature of investment duly approved by the competent authority.

....."

4. Further, the Hon'ble Commission, vide Tariff Order dated 18th March 2026 in Case No. 54 of 2025, directed BGCL to obtain prior regulatory approval from the Hon'ble Commission for the revised cost of Rs. 21.74 Crore claimed towards installation of ABT Meters during FY 2026–27, as against the balance approved cost of Rs. 6.21 Crore. The Commission had already, vide Tariff Order dated 21.03.2023, provisionally approved capitalization of Rs. 12.06 Crore towards installation of ABT Meters during FY 2022–23, against which BGCL had already capitalized an amount of Rs. 5.84 Crore, inclusive of IDC and IEDC. Accordingly, only the balance amount of Rs. 6.21 Crore remained to be capitalized in FY 2026–27; however, BGCL had claimed a revised capitalization of Rs. 21.74 Crore. The relevant extracts of the Tariff Order are reproduced below:

"In context of above submission, it has been noticed that the Commission vide tariff order dated 21.03.2023 provisionally approved capitalization of Rs 12.06 Cr towards installation of ABT meter during FY 2022-23. The petitioner in its reply to Data Gap I submitted that out of Rs 12.05 Cr provisionally approve for installation of ABT meters, the petitioner has capitalized an amount of Rs 5.84 Cr inclusive of IDC and IEDC.

Considering the petitioner's submission and fact the scope of installation of ABT

metering is expanded based on directives of SLDC, the Commission decides to provisionally approve projected capitalization of Rs 6.21 Cr during FY 2026-27 i.e. (12.05 Cr – 5.84 Cr = 6.21 Cr). The petitioner is directed to approach the Commission with a separate petition in accordance with the provisions of BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018 for approval of the Commission on revised cost of Rs 21.74 Cr. The Commission shall ascertain the necessity of work and cost after prudent check of details submitted in the said petition and accord its approval."

5. Accordingly, BGCL is filing the present Petition before the Hon'ble Commission seeking regulatory approval for the revised cost of Rs. 21.74 Crore towards installation of ABT Meters, as against the earlier balance approved cost of Rs. 6.21 Crore, in accordance with the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018, and in line with the directions issued by the Hon'ble Commission vide Tariff Order dated 18th March 2026.
6. Apart from the approval for the revised cost towards installation of ABT Meters as directed vide Tariff Order dated 18th March 2026 in Case No. 54 of 2025, the Hon'ble Commission also directed BGCL to approach the Hon'ble Commission for final approval of the capitalization towards additional civil works amounting to Rs. 27.29 Crore, comprising Rs. 1.35 Crore during FY 2025–26 and Rs. 25.94 Crore during FY 2026–27, in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018. Although the Hon'ble Commission had provisionally approved the said capitalization in the Tariff Order, BGCL was specifically directed to seek final approval of the same through a separate Petition under the applicable Regulations. The relevant extracts of the Tariff Order are reproduced below:

“(d) Capitalization on account of Additional Civil Works

....In the instant case the petitioner has not actually incurred the expenditure rather the petitioner proposes to incurred the expenditure on Additional civil work

during the FY 2025-26 and FY 2026-27. However, after verifying the details and reasons for undertaking the proposed civil work during FY 2025-26 and FY 2026-27, the Commission decides to provisionally consider the capitalization on account of additional civil work amounting to Rs 27.29 Cr (Rs 1.35 Cr during FY 2025-26 and Rs 25.94 Cr during FY 2026-27). The Commission directs the petitioner to approach the Commission for approval of the additional civil work claim in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018. Based on the prudent check and necessity of work, the Commission shall approve the cost of work, and the same shall be considered during APR of FY 2026-27.

.....

"In line with the provisions under Regulation 19.1 and Regulation 19.2 of MYT Transmission Tariff Regulations 2024, the Commission has decided to provisionally consider capitalization towards procurement of initial spares amounting to Rs 28.15 Cr (Rs 11.45 Cr during the APR year FY 2025-26 and Rs 16.70 Cr during FY 2026-27) and Capitalization towards additional civil work amounting Rs 27.29 Cr (Rs 1.35 Cr during FY 2025-26 and Rs 25.94 Cr during FY 2026-27). For the sake of brevity, we will not go into detail in this chapter. However, the Petitioner is directed to approach the Commission for final approval of the additional civil works' claim in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018."

7. Accordingly, BGCL is filing the present Petition before the Hon'ble Commission seeking regulatory approval for capitalization of Rs. 27.29 Crore towards additional civil works in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018, and in line with the directions issued by the Hon'ble Commission vide Tariff Order dated 18th March 2026.
8. Accordingly, BGCL is filing the present Petition before the Hon'ble Commission seeking regulatory approval for the revised capitalization of Rs. 21.74 Crore towards installation of ABT Meters, as against the earlier balance approved cost of Rs. 6.21 Crore, and approval for capitalization of Rs. 27.29 Crore towards

additional civil works in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018, and the directions issued by the Hon'ble Commission vide Tariff Order dated 18th March 2026. Further, BGCL is also submitting four new projects proposed to be capitalized during the control period from FY 2025-26 to FY 2027-28, in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018.

9. The present Petition is prepared in accordance with the provisions of the following Acts/Regulations namely:
 - Electricity Act, 2003.
 - BERC (Procedure for filing Capital investment and Capitalization plan) Regulations, 2018, as amended time to time.
10. BGCL along with this petition is submitting information to the extent applicable and would make available any further information/additional data required by the Hon'ble Commission during the course of the proceedings.
11. In view of the above, BGCL respectfully prays that the Hon'ble Commission may be pleased to consider and approve the following:
 - a. Admit this Petition.
 - b. Examine the proposal submitted in the enclosed Petition for a favorable dispensation.
 - c. To kindly grant Regulatory approval as sought in this Petition for works to be carried out as submitted in this Petition.
 - d. To kindly approve the estimated cost for proposed capital investment as submitted in this Petition and accordingly approve the proposed funding for these projects.
 - e. To kindly pass through the difference in the cost estimates submitted in this Petition and actual Awarded cost discovered after the tender processing through competitive bidding, as the variation is beyond the control of BGCL.
 - f. Permit to propose suitable changes to the respective capital

- investment petition, prior to the final approval by the Hon'ble Commission.
- g. Condone any inadvertent omission/errors/short comings and permit the petitioner to add/change/modify/alter this filing and make further submissions as may be required at a future date.
 - h. Pass such Order as the Hon'ble Commission may deem fit and appropriate keeping in view the facts and circumstances of the case.

Bihar Grid Company Limited (BGCL) Patna.

Place: Patna.

Date: 21 May, 2026.

Rajesh
Sr. GM (O&M/Commercial)

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(1) Petition for Prior Approval of Investment Plan & Capitalization:

1.1 Background:

- 1.1.1 BGCL had filed its Tariff Petition dated 15th November 2025 before the Hon'ble Bihar Electricity Regulatory Commission (BERC) seeking approval for the Truing-Up of FY 2024–25, Annual Performance Review (APR) for FY 2025–26, and determination of Aggregate Revenue Requirement (ARR) and Transmission Tariff for FY 2026–27. After examining the submissions made by BGCL, the Hon'ble Commission issued the Tariff Order dated 18th March 2026 in Case No. 54 of 2025.
- 1.1.2 The Hon'ble Commission, vide the aforesaid Tariff Order dated 18th March 2026 in Case No. 54 of 2025, observed that BGCL had claimed a revised capitalization of Rs. 21.74 Crore towards installation of ABT Meters during FY 2026–27, as against the balance approved cost of Rs. 6.21 Crore. The Hon'ble Commission further noted that, vide Tariff Order dated 21.03.2023, capitalization of Rs. 12.06 Crore towards installation of ABT Meters during FY 2022–23 had been provisionally approved, out of which BGCL had already capitalized Rs. 5.84 Crore, inclusive of IDC and IEDC, leaving a balance approved amount of Rs. 6.21 Crore for capitalization during FY 2026–27. Since the revised claim of Rs. 21.74 Crore exceeded the balance approved capitalization, the Hon'ble Commission directed BGCL to obtain regulatory approval for the revised cost in accordance with the applicable provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018.
- 1.1.3 In compliance with the directions of the Hon'ble Commission, BGCL is filing the present Petition seeking regulatory approval for the revised cost of Rs. 21.74 Crore towards installation of ABT Meters, as against the earlier balance approved cost of Rs. 6.21 Crore, in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018, and the directions issued by the Hon'ble Commission vide Tariff Order dated 18th March 2026.
- 1.1.4 Apart from the approval for the revised cost towards installation of ABT Meters,

the Hon'ble Commission also directed BGCL to approach the Hon'ble Commission for final approval of the capitalization towards additional civil works amounting to Rs. 27.29 Crore, comprising Rs. 1.35 Crore during FY 2025–26 and Rs. 25.94 Crore during FY 2026–27, in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018. Although the Hon'ble Commission had provisionally considered the said capitalization in the Tariff Order, BGCL was specifically directed to seek final approval of the same through a separate Petition under the applicable Regulations.

1.1.5 Accordingly, BGCL is filing the present Petition before the Hon'ble Commission seeking regulatory approval for capitalization of Rs. 27.29 Crore towards additional civil works in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018, and in line with the directions issued by the Hon'ble Commission vide Tariff Order dated 18th March 2026.

1.1.6 Further, through the present Petition, BGCL is also seeking approval for four new projects proposed to be capitalized during the control period from FY 2025–26 to FY 2027–28, in addition to approval of the revised cost towards installation of ABT Meters and regulatory approval for capitalization of Rs. 27.29 Crore towards additional civil works.

1.2 Approach to Filing of Current Petition

1.2.1 Regulation 6.2 of BERC (Procedure for filing Capital investment and Capitalisation plan) Regulations, 2018 provides for submission of Capital investment Plan every year with the ARR/Multi-year ARR Petition, as reproduced below:

“6.2 The Licensee(s) shall submit the Capital investment Plan every year with the ARR/Multi-year ARR petition and it should inter-alia contain:-

(a) Scheme wise Source wise actual capital expenditure and capitalization for previous year vis-a-vis projected in the investment plan for that year;

(b) Scheme wise Source wise actual capital expenditure and capitalization for first six months of current year vis-à-vis projected in the investment plan for that period;

(c) Scheme wise Source wise capital investment plan containing year wise schedule of capital expenditure and capitalization for next ten years starting from ensuing years. Based on actual expenditure and capitalization the rolling plan may get revised in subsequent filings. The capital investment plan should show scheme wise objective of the investment.

Provided that such capital investment plan seeking regulatory approval shall be supported with Detailed Project Report (DPR) duly approved by the competent authority.

Provided further that if DPR duly approved by the competent authority is not available till finalization of the capital investment plan, the licensee(s) may include such investment in the capital investment plan as mentioned above. However the licensee shall submit the approved DPR to the Commission in its immediate next filing following approval of such DPR.

Provided also that the Capital investment (made out of internally generated fund) for which no DPR is prepared shall also be a part of capital investment plan as mentioned above. However the licensee shall submit such statement/report to substantiate the purpose and nature of investment duly approved by the competent authority.

....."

- 1.2.2 Further, the Hon'ble Commission, vide Tariff Order dated 18th March 2026 in Case No. 54 of 2025, directed BGCL to obtain prior regulatory approval from the Hon'ble Commission for the revised cost of Rs. 21.74 Crore claimed towards installation of ABT Meters during FY 2026–27, as against the balance approved cost of Rs. 6.21 Crore. The Commission had already, vide Tariff Order dated 21.03.2023, provisionally approved capitalization of Rs. 12.06 Crore towards installation of ABT Meters during FY 2022–23, against which BGCL had already capitalized an amount of Rs. 5.84 Crore, inclusive of IDC and IEDC. Accordingly, only the balance amount of Rs. 6.21 Crore remained to be capitalized in FY 2026–27; however, BGCL had claimed a revised capitalization of Rs. 21.74 Crore. The relevant extracts of the Tariff Order are reproduced below:

"In context of above submission, it has been noticed that the Commission vide tariff order dated 21.03.2023 provisionally approved capitalization of Rs 12.06 Cr towards installation of ABT meter during FY 2022-23. The petitioner in its reply to Data Gap I submitted that out of Rs 12.05 Cr provisionally approve for installation of ABT meters, the petitioner has capitalized an amount of Rs 5.84 Cr inclusive of IDC and IEDC.

Considering the petitioner's submission and fact the scope of installation of ABT metering

is expanded based on directives of SLDC, the Commission decides to provisionally approve projected capitalization of Rs 6.21 Cr during FY 2026-27 i.e. (12.05 Cr – 5.84 Cr = 6.21 Cr). The petitioner is directed to approach the Commission with a separate petition in accordance with the provisions of BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018 for approval of the Commission on revised cost of Rs 21.74 Cr. The Commission shall ascertain the necessity of work and cost after prudent check of details submitted in the said petition and accord its approval.”

- 1.2.3 Accordingly, BGCL is filing the present Petition before the Hon'ble Commission seeking regulatory approval for the revised cost of Rs. 21.74 Crore towards installation of ABT Meters, as against the earlier balance approved cost of Rs. 6.21 Crore, in accordance with the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018, and in line with the directions issued by the Hon'ble Commission vide Tariff Order dated 18th March 2026.
- 1.2.4 Apart from the approval for the revised cost towards installation of ABT Meters as directed vide Tariff Order dated 18th March 2026 in Case No. 54 of 2025, the Hon'ble Commission also directed BGCL to approach the Hon'ble Commission for final approval of the capitalization towards additional civil works amounting to Rs. 27.29 Crore, comprising Rs. 1.35 Crore during FY 2025–26 and Rs. 25.94 Crore during FY 2026–27, in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018. Although the Hon'ble Commission had provisionally considered the said capitalization in the Tariff Order, BGCL was specifically directed to seek final approval of the same through a separate Petition under the applicable Regulations. The relevant extracts of the Tariff Order are reproduced below:

“(d) Capitalization on account of Additional Civil Works

....In the instant case the petitioner has not actually incurred the expenditure rather the petitioner proposes to incurred the expenditure on Additional civil work during the FY 2025-26 and FY 2026-27. However, after verifying the details and reasons for undertaking the proposed civil work during FY 2025-26 and FY 2026-

27, the Commission decides to provisionally consider the capitalization on account of additional civil work amounting to Rs 27.29 Cr (Rs 1.35 Cr during FY 2025-26 and Rs 25.94 Cr during FY 2026-27). The Commission directs the petitioner to approach the Commission for approval of the additional civil work claim in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018. Based on the prudent check and necessity of work, the Commission shall approve the cost of work, and the same shall be considered during APR of FY 2026-27.

.....

"In line with the provisions under Regulation 19.1 and Regulation 19.2 of MYT Transmission Tariff Regulations 2024, the Commission has decided to provisionally consider capitalization towards procurement of initial spares amounting to Rs 28.15 Cr (Rs 11.45 Cr during the APR year FY 2025-26 and Rs 16.70 Cr during FY 2026-27) and Capitalization towards additional civil work amounting Rs 27.29 Cr (Rs 1.35 Cr during FY 2025-26 and Rs 25.94 Cr during FY 2026-27). For the sake of brevity, we will not go into detail in this chapter. However, the Petitioner is directed to approach the Commission for final approval of the additional civil works' claim in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018."

- 1.2.5 Accordingly, BGCL is filing the present Petition before the Hon'ble Commission seeking regulatory approval for capitalization of Rs. 27.29 Crore towards additional civil works in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018, and in line with the directions issued by the Hon'ble Commission vide Tariff Order dated 18th March 2026.
- 1.2.6 Accordingly, BGCL is filing the present Petition before the Hon'ble Commission seeking regulatory approval for the revised capitalization of Rs. 21.74 Crore towards installation of ABT Meters, as against the earlier balance approved cost of Rs. 6.21 Crore, and approval for capitalization of Rs. 27.29 Crore towards additional civil works in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018, and the directions

issued by the Hon'ble Commission vide Tariff Order dated 18th March 2026. Further, BGCL is also submitting four new projects proposed to be capitalized during the control period from FY 2025-26 to FY 2027-28, in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018.

1.3 List of projects filed in the present Petition for prior approval:

1.3.1 List of projects filed in the present Petition for prior approval is given below:

All Values in Rs. Crores

Sl. No.	Description	Cost of Project	FY 2025-26		FY 2026-27	
			Capex	Capitalization	Capex	Capitalization
Compliance to Tariff Order dated 18.03.2026						
1.	Procurement of ABT compliant Interface Energy Meters & its accessories, including Supply, Installation, F&I, Annual Maintenance Contract and Energy Audit & Report Generation for 5 years	22.27	-	-	14.34 (Excluding AMC Cost of Rs. 7.93 Cr)	14.34
2.	Additional Civil Works	27.29	1.35	1.35	25.94	25.94
List of New Projects						
3.	Approval for the upgradation of existing Substation Automation System (SAS) system in Phase-IV, Part-I Projects	12.60	-	-	12.60	12.60
4.	Approval for the establishment of Centralised Control Centre (CCC) at Bihar Grid for better operational efficiency	6.68	-	-	6.68	6.68
5.	Approval for upgradation of loading capacity of 33kV Bays at Sheikhopur Sarai, Narhat, Bhusaula GIS Substations of BGCL and 33kV new Bay construction	3.2	-	-	3.2	3.2

Sl. No.	Description	Cost of Project	FY 2025-26		FY 2026-27	
			Capex	Capitalization	Capex	Capitalization
	work at Bhusaula, Goradih and Narhat GIS Substations of BGCL					
6.	Supply and Installation of 325 KW Roof Top Solar Power System at 11 nos. GIS Substation of BGCL	1.72	-	-	1.72	1.72

1.4 Revised Cost Approval for Installation of ABT Meters:

- 1.4.1 BGCL respectfully submits that the Hon'ble Commission, vide Tariff Order dated 21.03.2023, had approved capitalization of Rs. 12.06 Crore towards implementation of the ABT Metering Scheme, comprising approved CAPEX of Rs. 4.99 Crore in the True-Up of FY 2021-22 and projected CAPEX of Rs. 7.08 Crore for FY 2022-23. The said capitalization was primarily envisaged for implementation at interface points at the 33 kV level.
- 1.4.2 Subsequently, BGCL, in its Tariff Petition for the True-Up of FY 2024-25, APR for FY 2025-26, and ARR for FY 2026-27, claimed revised capitalization of Rs. 21.74 Crore towards implementation of the ABT Metering Scheme during FY 2026-27, comprising hard cost of Rs. 16.00 Crore, IDC of Rs. 4.52 Crore, and IEDC of Rs. 1.22 Crore. BGCL had submitted before the Hon'ble Commission that the scope of the ABT Metering Scheme had undergone substantial revision and expansion pursuant to the directives issued by SLDC/BSPTCL for implementation of SAMAST, accurate energy accounting, transmission loss calculation, and grid metering compliance at all interface points across the transmission network. BGCL had further submitted that Phase-II of the ABT metering work was under tendering stage and that the Petitioner would approach the Hon'ble Commission with a detailed Capital Investment Plan upon completion of the tendering process. The relevant submission of BGCL, as recorded in the Tariff Order dated 18th March 2026, is reproduced below:

"SLDC has revised and expanded the scope of ABT meters and its

Bihar Grid Company Limited (BGCL)

requirement to include additional connection points across the transmission system for accurate accounting and grid metering compliance. Owing to this revised requirement, the overall number of ABT meters and project cost have been increased to Rs 21.74 Cr inclusive of IDC and IEDC. The petitioner submitted that phase 2 of the ABT metering work currently is in tendering stage. Upon finalization of tendering and subsequent proceedings, the Petitioner shall duly approach the Commission with a detailed Capital Investment Plan, along with scheme-wise scope, estimated cost, justification, and implementation schedule, in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018."

- 1.4.3 It is further submitted that the revised project cost has been necessitated on account of substantial expansion in the scope of work pursuant to the directions issued by BSPTCL/SLDC from time to time. In this regard, the Chief Engineer (System Operation), BSPTCL, vide letters dated 11.12.2019, 14.02.2022, and 25.04.2022, directed BGCL to install ABT compliant meters with communication facilities and AMR integration at all interface points across 220 kV, 132 kV, 33 kV, and transformer HV/LV levels for proper energy accounting, transmission loss calculation, and SAMAST compliance. The said directions significantly expanded the scope from installation of ABT meters at identified 33 kV interface points to implementation of a comprehensive SAMAST-compliant integrated metering and communication infrastructure across the transmission network.
- 1.4.4 Accordingly, the revised scope of work includes procurement, supply, installation, testing, and commissioning of ABT compliant Interface Energy Meters (IEMs), AMR/DAS systems, communication gateways, GPS synchronization systems, networking infrastructure, servers, software systems, metering panels, DCUs, communication architecture, Annual Maintenance Contract (AMC), and Energy Audit & Report Generation systems across various grid substations of BGCL. Pursuant to detailed engineering assessment, field survey, and tendering activities, BGCL finalized the revised cost estimate for

implementation of the ABT Metering Scheme, which was approved by the Board of Directors vide Board Approval dated 07.11.2025 in the 51st Board Meeting held on 02.09.2025. The Board-approved project cost amounts to Rs. 16.52 Crore inclusive of GST through open tender enquiry basis.

- 1.4.5 It is submitted that the approved project cost of Rs. 16.52 Crore includes Supply, Installation, Testing & Commissioning of ABT compliant Interface Energy Meters (IEMs), communication infrastructure, Automated Meter Reading (AMR) systems, AMC, and Energy Audit & Report Generation services for a period of five years. Out of the total approved project cost, the cost towards Supply and Erection/Installation works amounts to Rs. 8.59 Crore, whereas the cost towards AMC and Energy Audit & Report Generation services for five years amounts to Rs. 7.93 Crore. The detailed calculation of AMC and Energy Audit & Report Generation charges for five years, along with year-wise expenditure, is provided at Page No. 41 to the present Petition under **Annexure-I**.
- 1.4.6 Further, out of the 128 meters installed earlier during FY 2022–23, only 87 meters have been considered under AMC, while the balance 41 meters have been included under the present tender scope. Accordingly, the total quantity considered under AMC works out to 280 numbers of ABT Meters. BGCL respectfully requests the Hon'ble Commission to approve the AMC and Energy Audit cost of Rs. 7.93 Crore under R&M Expenses from FY 2026–27 onwards for a period of five years, over and above the normative R&M Expenses allowed by the Hon'ble Commission, and allow the remaining Rs. 8.59 Crore as capital expenditure towards procurement, supply, installation, testing, and commissioning of ABT Meters and associated systems for FY 2026–27.
- 1.4.7 The detailed scope of work, technical specifications, qualifying requirements, and implementation framework were incorporated in the NIT dated 14.01.2026 floated by BGCL for “Supply, Installation, Testing & Commissioning of ABT compliant meters for implementation of SAMAST guidelines of BSPTCL including AMC and Energy Audit at various Grid Substations in Bihar Grid

Company Limited.” Further, BGCL issued extension notices dated 24.02.2026 and 25.03.2026 extending the bid sale, submission, and opening dates under the aforesaid NIT to ensure wider participation and competitive price discovery through a transparent bidding process.

1.4.8 Accordingly, based on the revised Board-approved cost of Rs. 16.53 Crore, along with IDC of Rs. 4.52 Crore and IEDC of Rs. 1.22 Crore, the total revised capitalization of the ABT Metering Scheme works out to Rs. 22.27 Crore. The increase from the earlier claimed capitalization of Rs. 21.74 Crore is primarily attributable to the revision in the cost from Rs. 16.00 Crore to Rs. 16.53 Crore based on the final Board-approved estimate and tendered scope of work, whereas the IDC and IEDC have been provisionally considered at the same level as submitted in the Tariff Petition filed on 15th November 2025. However, the IDC and IEDC claimed in the present Petition are tentative and shall be considered on actual basis during the truing-up period.

1.4.9 In view of the above facts, the mandatory requirements under SAMAST implementation, the directions issued by BSPTCL/SLDC, the substantial expansion in scope, the detailed DPR/BoQ, the Board-approved revised estimate, and the transparent competitive tendering process undertaken by BGCL, the Petitioner respectfully prays before the Hon'ble Commission to accord prior approval for the revised capitalization of Rs. 22.27 Crore towards implementation of the ABT Metering Scheme, as detailed below:

All Values in Rs. Crores

Sl. No.	Description	Cost of Project	Hard Cost	IDC	IEDC
1.	Procurement of ABT compliant Interface Energy Meters & its accessories, including Supply, Installation, F&I, Annual Maintenance Contract and Energy Audit & Report Generation for 5 years	22.27	16.53 (Including R&M Cost of Rs. 7.93 Cr)	4.52	1.22

1.4.10 Further, for the ready reference and kind consideration of the Hon'ble Commission,

BGCL has enclosed copies of the BSPTCL/SLDC letters dated 11.12.2019, 14.02.2022, and 25.04.2022 issued by the Chief Engineer (System Operation), BSPTCL regarding expansion of scope and installation of ABT meters at all interface points, Board Approval dated 07.11.2025 for the revised cost estimate, detailed DPR and BoQ, NIT dated 14.01.2026, and extension notices dated 24.02.2026 and 25.03.2026 pertaining to the tendering process for implementation of the ABT Metering Scheme as **Annexure-I** to the present Petition.

1.5 Cost Approval for additional civil works:

1.5.1 The Hon'ble Commission, vide Tariff Order dated 18.03.2026, provisionally approved the capitalization towards additional civil works during FY 2025–26 to FY 2027–28, as provided in the table below:

All Values in Rs. Crores

Sl. No.	Description	Cost of Project Approved as per T.O dated 18.03.2026	FY 2025-26 Capitalization		FY 2026-27 Capitalization	
			Claimed	Approved	Claimed	Approved
1.	Additional Civil Works	27.29	1.35	1.35	25.94	25.94

1.5.2 It is respectfully submitted that the Hon'ble Commission, vide Tariff Order dated 18.03.2026, had provisionally approved capitalization towards additional civil works amounting to Rs. 27.29 Crore, comprising Rs. 1.35 Crore during FY 2025–26 and Rs. 25.94 Crore during FY 2026–27, and further directed BGCL to approach the Hon'ble Commission for final approval of the said works in accordance with the provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018.

1.5.3 In compliance with the aforesaid directions of the Hon'ble Commission, BGCL is

submitting the present Petition seeking approval of the additional civil works proposed to be undertaken at various substations. It is submitted that the proposed civil works are essential for ensuring smooth operation, security, maintenance support, storage facilities, and administrative infrastructure required for reliable operation of the transmission system and newly commissioned GIS substations. The proposed works are directly associated with operational requirements of BGCL substations and are necessary for ensuring safe and efficient functioning of the transmission network.

- 1.5.4 In this regard, BGCL had obtained Board approval dated 04.07.2023 in the 44th Meeting of the Board of Directors for value addition works proposed at 400/220/132/33 kV Naubatpur and Jakkanpur GIS Substations under Phase-IV, Part-II Projects, including: (i) construction of Transit Camp-cum-Field Hostel, (ii) construction of Security Barrack-cum-Field Hostel for fitters, and (iii) construction of trussless store buildings for storage of GIS spare parts. The estimated cost for the aforesaid works was approved at Rs. 9.5 Crore for both substations together, along with an additional estimated cost of Rs. 5.07 Crore towards purchase of land and construction of RCC approach road near Naubatpur GIS Substation, leading to a total approved cost of Rs. 14.57 Crore. Subsequently, the works relating to construction of Security Barrack-cum-Field Hostel for fitters and construction of trussless store buildings for GIS spare parts at Naubatpur and Jakkanpur GIS Substations were again placed before the Board in the 49th Meeting held on 12.12.2024, wherein the same estimated cost for the said works was considered and approved separately. Accordingly, the total approved cost towards the aforesaid value addition civil works remains Rs. 14.57 Crore.
- 1.5.5 Further, approval note for construction of one GIS Store as per BGCL Engineering Drawing at 220/132/33 kV GIS Dumraon Substation has already been prepared along with the detailed DPR, estimate, drawings, and BoQ for the said work through the approval note dated 06.01.2025. The proposed GIS store is necessary since the existing indoor store at Dumraon Substation is not suitable for storage of GIS spares and the available GIS hall space is required for upcoming 220 kV GIS bay extension works. Accordingly, the proposal for construction of a dedicated

trussless GIS spare store building of size 20m × 15m was examined and the estimated cost was worked out to Rs. 0.97 Crore inclusive of GST. The detailed DPR, cost estimate, consultant reports, and engineering analysis have already been prepared and finalized by BGCL vide Approval Note dated 06.01.2025, and the same are attached as **Annexure-II** to the present Petition.

- 1.5.6 Further, BGCL has also prepared a detailed estimate amounting to Rs. 5.85 Crore towards construction of the permanent Headquarters Building of BGCL at Bhusaula Substation vide proposal dated 19.03.2024, including civil, sanitary, electrical, HVAC, firefighting, and lift works. The proposal was prepared after detailed engineering assessment, structural analysis, consultant study, DPR preparation, and cost estimation. The proposed Headquarters Building is necessary since the existing BGCL office is functioning from a rented premises involving substantial recurring rental expenditure and operational constraints including shortage of parking space and administrative limitations. The proposed headquarters at Bhusaula Substation shall be constructed on BGCL's own land and would significantly improve administrative efficiency, operational coordination, and long-term cost optimization.
- 1.5.7 The detailed DPR, cost estimate, consultant reports, and engineering analysis have already been prepared and finalized by BGCL vide Approval Note dated 19.03.2024, and the same are attached as **Annexure-II** to the present Petition.
- 1.5.8 Accordingly, against the total additional civil works capitalization of Rs. 27.29 Crore provisionally considered by the Hon'ble Commission, BGCL has presently submitted supporting Board approvals/approval notes and DPRs for works amounting to approximately Rs. 21.39 Crore, comprising Rs. 14.57 Crore for value addition civil works at Naubatpur and Jakkanpur GIS substations, Rs. 0.97 Crore for construction of GIS Store at Dumraon GIS Substation, and Rs. 5.85 Crore towards construction of Headquarters Building at Bhusaula Substation. The remaining balance amount of approximately Rs. 5.9 Crore pertains to additional civil works which are presently under various stages of planning, approval, and execution. BGCL undertakes that, as and when the corresponding Board approvals and

expenditure details are finalized, the same shall be submitted before the Hon'ble Commission through separate Capital Expenditure Petitions in accordance with the applicable provisions of the BERC (Procedure for Filing Capital Investment and Capitalization Plan) Regulations, 2018.

- 1.5.9 In view of the above, it is respectfully submitted that the additional civil works proposed by BGCL are genuine, necessary, and directly related to operation, maintenance, security, administrative efficiency, and reliable functioning of the transmission system. Further, the Hon'ble Commission has already provisionally considered capitalization of Rs. 27.29 Crore in the Tariff Order dated 18.03.2026 after prudence check of the necessity of the works. Accordingly, BGCL respectfully prays before the Hon'ble Commission to accord approval for capitalization towards additional civil works as already provisionally approved in the Tariff Order dated 18.03.2026, subject to submission of remaining Board approvals and supporting documents as and when the same are approved by the Board of Directors of BGCL.
- 1.5.10 Further, for the ready reference and kind consideration of the Hon'ble Commission, BGCL has enclosed copies of the Board Approvals dated 04.07.2023 and 12.12.2024 for construction of Security Barrack-cum-Field Hostel for fitters and trussless store buildings for GIS spares at Naubatpur and Jakkanpur GIS substations, approval note dated 06.01.2025 along with DPR and cost estimate for construction of trussless store building for GIS spares at Dumraon GIS Substation, and approval note dated 19.03.2024 along with DPR, cost estimate and NIT extension for construction of the Headquarters Building of BGCL at Bhusaula Substation, under **Annexure-II** to the present Petition.
- 1.6 Details of New Projects Proposed for Capitalization During FY 2025-26 to FY 2027-28:**
- 1.6.1 List of new projects Proposed for Capitalization During FY 2025-26 to FY 2027-28 are as follows:

All Values in Rs. Crores

Sl. No.	Description	Cost of Project	FY 2026-27		FY 2027-28	
			Capex	Capitalization	Capex	Capitalization
1.	Approval for the upgradation of existing Substation Automation System (SAS) system in Phase-IV, Part-I Projects	12.60	12.60	12.60	-	-
2.	Approval for the establishment of Centralised Control Centre (CCC) at Bihar Grid for better operational efficiency	6.68	6.68	6.68	-	-
3.	Approval for upgradation of loading capacity of 33kV Bays at Sheikhopur Sarai, Narhat, Bhusaula GIS Substations of BGCL and 33kV new Bay construction work at Bhusaula, Goradih and Narhat GIS Substations of BGCL	3.2	3.2	3.2	-	-
4.	Supply and Installation of 325 KW Roof Top Solar Power System at 11 nos. GIS Substation of BGCL	1.72	1.72	1.72	-	-

Approval for the upgradation of existing Substation Automation System (SAS) system in Phase-IV, Part-I Projects

1.6.2 It is respectfully submitted that BGCL is seeking prior approval of the Hon'ble Commission for additional capitalization of Rs. 12.60 Crore towards upgradation of the existing Substation Automation System (SAS) installed at various GIS substations of BGCL under Phase-IV, Part-I projects. The proposed expenditure has become necessary due to technological obsolescence, ageing of the existing SAS infrastructure, and operational risks associated with continued operation of outdated systems.

1.6.3 As per the CERC guidelines, the useful life expectancy of IT systems, SCADA, and

communication systems (excluding OPGW) is considered to be seven years. Accordingly, the existing SAS systems installed at the GIS substations of BGCL under Phase-IV, Part-I projects have already completed around seven years of service and are approaching the end of their useful operational life.

- 1.6.4 Further, the existing servers and gateways are presently operating on Windows 7 OS, which has become obsolete and unsupported. Microsoft has already discontinued support for Windows 7 and no longer provides security patches or updates for newly identified vulnerabilities. Consequently, the existing SAS systems have become increasingly vulnerable to cybersecurity threats, operational failures, and system instability. In addition, several operational issues are being encountered in the existing SAS systems, including freezing of logical inputs, delay in receipt of GOOSE signals, SPS communication failures, delay in fetching historical data, and BCU hanging, thereby affecting the reliability and smooth functioning of the substations.
- 1.6.5 It is further submitted that the OEM of the SAS system has discontinued support for Windows XP and Windows 7 based systems and has recommended migration to Windows 10-based SAS systems. Since Microsoft has declared end-of-life support for Windows XP and Windows 7, the existing systems have become vulnerable from security, reliability, and operational perspectives. Therefore, BGCL proposes to upgrade the existing SAS systems, including associated HMI, servers, gateways, and related operational software, to Windows 10-based systems to ensure secure, reliable, and uninterrupted grid operation.
- 1.6.6 The cost estimate for the proposed upgradation has been prepared based on the techno-commercial offer received from the OEM, M/s Hitachi. The proposed expenditure includes supply, installation, testing, commissioning, and SAS spares required for upgradation works across various BGCL substations. The estimated financial implication of the proposed works amounts to Rs. 12.60 Crore under the "Additional Capitalization" head.
- 1.6.7 Further, the Board of Directors of BGCL, vide Minutes of the 55th Board Meeting

held on 10th April 2026, accorded 'in-principle' approval for upgradation of the existing SAS systems under Phase-IV, Part-I projects and further directed BGCL to approach the Hon'ble BERC for approval of the said expenditure under additional capitalization.

- 1.6.8 Accordingly, BGCL respectfully prays before the Hon'ble Commission to accord prior approval for additional capitalization of Rs. 12.60 Crore towards upgradation of the SAS system in accordance with the applicable provisions of the BERC Regulations and in the interest of reliable, secure, and uninterrupted grid operations.
- 1.6.9 Further, for the ready reference and kind consideration of the Hon'ble Commission, BGCL has enclosed the Board Approval dated 27.04.2026, detailed DPR, BoQ and Price Quotation Letter from Siemens pertaining to the proposed upgradation of the SAS system as **Annexure-III** to the present Petition.

Approval for the establishment of Centralised Control Centre (CCC) at Bihar Grid for better operational efficiency

- 1.6.10 It is respectfully submitted that, at present, the control and monitoring of substations under BGCL are being carried out in a decentralized manner, resulting in operational challenges relating to system monitoring, fault detection, response time, coordination, and overall grid reliability. Further, with the increasing complexity of the transmission network, integration of GIS substations, implementation of SAMAST, and growing operational requirements of the grid, establishment of a centralized monitoring and supervisory framework has become essential for ensuring reliable, efficient, and secure operation of the transmission system.
- 1.6.11 Accordingly, BGCL has proposed establishment of a Centralised Control Centre (CCC) equipped with advanced supervisory, monitoring, communication, and control systems for centralized monitoring and operation of substations across the

transmission network. The proposed CCC is envisaged to provide unified system oversight, faster decision-making, enhanced system reliability, optimized resource utilization, and improved response during contingencies and fault conditions, thereby strengthening real-time operational coordination and overall grid management.

1.6.12 In this regard, the Board of Directors of BGCL, vide Board Approval dated 10.04.2026 in the 55th Meeting of the Board of Directors, accorded "In-principle" approval for establishment of a Centralised Control Centre (CCC) at Bihar Grid for better operational efficiency with an estimated financial implication of Rs. 6.68 Crore, excluding GST and F&I charges. Accordingly, BGCL respectfully prays before the Hon'ble Commission to accord in-principle approval for the establishment of the Centralised Control Centre (CCC) at Bihar Grid with an estimated project cost of Rs. 6.68 Crore.

1.6.13 Further, for the ready reference and kind consideration of the Hon'ble Commission, BGCL has enclosed the Board Approval dated 10.04.2026, BoQ and Price Quotation Letter from Siemens pertaining to the establishment of the Centralised Control Centre (CCC) as **Annexure-IV** to the present Petition.

Approval for upgradation of loading capacity of 33kV Bays at Sheikhopur Sarai, Narhat, Bhusaula GIS Substations of BGCL and 33kV new Bay construction work at Bhusaula, Goradih and Narhat GIS Substations of BGCL

1.6.14 It is respectfully submitted that BSPTCL, in order to ensure reliable power evacuation and enhanced system stability, requested BGCL to undertake upgradation of loading capacity of existing 33 kV bays and construction of additional 33 kV bays at various GIS substations under BGCL. The proposed works are necessary to meet the increasing power flow requirements, improve operational flexibility, facilitate reliable evacuation of power, and ensure secure operation of the transmission system in line with the growing network demand.

- 1.6.15 Accordingly, BGCL has proposed upgradation of loading capacity of 33 kV bays at Sheikhopur Sarai, Narhat, and Bhusaula GIS Substations at an estimated cost of Rs. 56.93 Lakh. The said work is proposed to be undertaken in order to enhance the operational capability and reliability of the existing 33 kV bay infrastructure and is proposed to be booked under O&M expenditure of the Company.
- 1.6.16 Further, BGCL has also proposed construction of new 33 kV bays at Bhusaula, Goradih, and Narhat GIS Substations at an estimated cost of Rs. 263.14 Lakh pursuant to the request of BSPTCL and subject to approval of the Hon'ble Commission and/or other statutory permissions, if any. The proposed new bays are necessary for strengthening the transmission network, ensuring reliable power evacuation, and meeting the increasing load demand in the respective areas.
- 1.6.17 In this regard, the Board of Directors of BGCL, vide Board Approval dated 10.04.2026 in the 55th Meeting of the Board of Directors, accorded "In-principle" approval for upgradation of loading capacity of 33 kV bays at Sheikhopur Sarai, Narhat, and Bhusaula GIS Substations and construction of new 33 kV bays at Bhusaula, Goradih, and Narhat GIS Substations.
- 1.6.18 In view of the above, BGCL respectfully submits that the proposed upgradation of loading capacity and construction of new 33 kV bays are necessary for ensuring reliable power evacuation, improved system stability, operational flexibility, and secure operation of the transmission network. Accordingly, BGCL prays before the Hon'ble Commission to accord in-principle approval for the said works at an estimated cost of Rs. 320 Lakh.
- 1.6.19 Further, for the ready reference and kind consideration of the Hon'ble Commission, BGCL has enclosed the Board Approval dated 10.04.2026 along with the BoQ pertaining to the upgradation of loading capacity of 33 kV bays and construction of new 33 kV bays as **Annexure-V** to the present Petition.

Supply and Installation of 325 KW Roof Top Solar Power System at 11 nos. GIS Substation of BGCL

- 1.6.20 It is respectfully submitted that BGCL has proposed installation of 325 kW Roof Top Solar Power Systems at 11 GIS Substations of BGCL in order to promote usage of sustainable energy and improve energy efficiency across the transmission network. The proposed project is envisaged to reduce dependence on conventional power sources, optimize energy consumption at substations, and support environmentally sustainable grid operations in line with renewable energy initiatives and green energy objectives.
- 1.6.21 Accordingly, BGCL has proposed supply, installation, net metering, testing, and commissioning of 325 kW Roof Top Solar Power Systems at 11 GIS Substations through open tender basis at an estimated project cost of Rs. 1.72 Crore inclusive of GST and F&I charges.
- 1.6.22 In this regard, the Board of Directors of BGCL, vide Board Approval dated 10.04.2026 in the 55th Meeting of the Board of Directors, approved the cost estimate for supply and installation of the aforesaid 325 kW Roof Top Solar Power Systems at various GIS Substations of BGCL.
- 1.6.23 In view of the above, BGCL respectfully submits that the proposed installation of Roof Top Solar Power Systems is necessary for promoting sustainable energy usage, improving energy efficiency, and supporting environmentally sustainable operation of the transmission system. Accordingly, BGCL prays before the Hon'ble Commission to accord approval for the proposed project at an estimated cost of Rs. 1.72 Crore.
- 1.6.24 Further, for the ready reference and kind consideration of the Hon'ble Commission, BGCL has enclosed the Board Approval dated 10.04.2026 pertaining to the installation of 325 kW Roof Top Solar Power Systems at various GIS Substations as **Annexure-VI** to the present Petition.

Annexure-I



Bihar Grid Company Limited **(BGCL)**

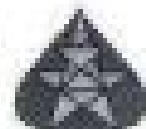
Detailed Project Report (DPR)

NIT No.- JV/PT/BG/C&M/25-26/OT-02

Name of the Work –

JV/PT/BG/C&M/25-26/OT-02- “Procurement of ABT compliant Interface Energy Meters & its accessories, including Supply, Installation, F&I, Annual Maintenance Contract and Energy Audit & Report Generation for 5 years”

बिहार ग्रिड कम्पनी लिमिटेड (संयुक्त उपक्रम बिहार स्टेट पावर (होल्डिंग) लि. और पावरग्रिड) BIHAR GRID COMPANY LIMITED



बिहार ग्रिड

(Joint Venture of Bihar State Power (Holding) Co. Ltd. & POWERGRID)

हुलिया गेट, गजबारा रोड, बलिया रोड, पटना-800001, गुजरात : 0673-2531477 (कार्यालय)
2nd Floor, Market Place, Boring Road, Patna-800001, G.O. : 0673-2531477 (ऑफिस), E-mail: bhargad@bharatnigam.com

CIN : L26100Bihar2013PL0018472

Ref: JNT/HRD/compsec/HRD-Scheme-01

Date: 01.11.2020

Extracts of the Minutes of the 51st meeting of the Board of Directors of Bihar Grid Company Limited held on Tuesday, 02nd September, 2020 at 05:00 p.m. at Vidyal Bhawan, Boring Road, Patna-800001, through online mode.

51.2.14. To approve the fresh cost estimate for the procurement of ABT compliant meters (EMs) for implementation of SAMAST Scheme at various Grid Substations of the Company.

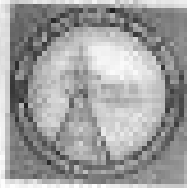
"Resolved that the Board has and hereby approves the procurement of ABT compliant Interface Energy Meters & its accessories, including Supply, Installation, F&I, Annual Maintenance Contract and Energy Audit & Report Generation for 5 years at an estimated cost of Rs. 16,52,59,755/- (Rupees Sixteen Crore Fifty Two Lakh Fifty Nine Thousand Seven Hundred Fifty Five) only inclusive of GST, through Open Tender Enquiry basis."

"Resolved further that the Managing Director / Director (Projects) of the Company, be and are hereby, severally authorized to take all such steps and do all such acts and deeds as may be deemed necessary to give effect to the resolution."

Certified True Copy
For Bihar Grid Company Limited
For Other Grid Companies Limited

(Signature)
Bikash Sinha
Company Secretary

(Signature)
S. K. Sinha (Chairman)
Bihar Grid Company Limited



Bihar State Power Transmission Company Ltd., Patna
A subsidiary company of Bihar State Power (Holding) Company
Ltd., Patna

CIN - U40102BR2012SCLC018009

[SAVE ENERGY FOR BENEFIT OF SELF AND NATION]

Head Office, Vidyan Eshwari, Bailey Road, Patna - 800011,
Telephone No. 8612-2504655, Email address - bspt@bsptcl.com
Fax No. 8612-2504655 Website - www.bsptcl.in

Letter No. **467**

File no-S.O. C/MSLDC/BGCT/22/2017

From,

Sri A.K. Chaudhary
Chief Engineer (System Operation)

Date **11/12/17**

To,

Sri C.C. Prasad
Sr.GM (O & M / Commercial)
2nd floor, Abankar Plaza, Boring Road
Patna-800001

Subject: Regarding availability of 15 min block wise meter data with AMR facility for loss accounting of BGCT, substations under SAMAST in EASS application.

Sir,

With reference to above subject, it is to inform that for proper energy accounting and accurate loss calculation the installed meter should be as per Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006 & its amendment so that 15 min block wise meter data with AMR facility & software to convert in ASD format must be available at SLDC for loss energy accounting of BGCT substations at all interfaces (220 KV , 132 KV , 33 KV & transformer HV/LV side) under SAMAST in EASS application.

Therefore, it is requested to kindly confirm the details of above installed meter otherwise kindly make a arrangement of meters at respective locations as per Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006 & its amendment at the earliest.

Sri A.K. Chaudhary
Chief Engineer (System Operation)

CHAND +



Bihar State Power Transmission Company Ltd., Patna
A subsidiary company of Bihar State Power (Holding) Company Ltd., Patna
CIN - 374100HR2011SGC018889
[SAVE ENERGY FOR BENEFIT OF SELF AND NATION]
Head Office, Vidyalok Bhawan, Bailey Road, Patna - 800021.

Letter No.

Dated:

File no. PAC/L-Long Transmission/040202

From:

Chief Engineer (System Operations)
Bihar State Power Transmission Co. Ltd.

To:

AGM-D&M (Commercial)
Bihar Grid Company Limited
2nd floor, Abanipal place, Boring Road
Patna, 800001

Sub: Regarding status of APT meter installation at BGCL Sub-station.

Ref: (i) Directive of Hon'ble BERC in fact/ order dated 25.03.2002

(ii) Your office letter no. (BGP/SG/OSM/SAMST)/3037 dated 05.11.2010

(iii) Our office letter no. 361 dated 18.12.2010

Re:

While enclosing the copy of directive issued by Hon'ble BERC which is self explanatory, it is to inform that APT energy meters at all interface points of 220kV, 132kV, 110kV & HV-LV side of transformers has to be installed as per BGCL fact/ order FR 3030-31. APT meter thereafter can be linked to SAMST via e-Meter application developed by M/s SPM, for SDC.

BGCL transmission loss calculation and energy accounting may be done on the basis of APT compliance meter data received via AMR in SAMST.

In view of above, kindly provide the status of installation on APT meter as well as availability to ensure meter data at SDC via AMR system from all interface points of 220kV, 132kV, 110kV and HV-LV side of transformers. Also furnish the details of meters already installed in LV side of 132/33kV transformers and feeders emanating from BGCL sub-stations, so that meter data can be used and BGCL energy accounting may be done with higher accuracy.

Text as above

Yours faithfully

Sd/-

(A. K. Chaudhary)

Chief Engineer (System Operations)

Memo No.

Copy forwarded to CE (STU), BSEPTCL/ Director (Operation), BSEPTCL/ (D&M) to M/L, BSEPTCL for kind information.

Date:

Sd/-

(A. K. Chaudhary)

Chief Engineer (System Operations)





SECRET

Bihar State Power Transmission Company Ltd., Patna
A subsidiary company of Bihar State Power (Holding) Company Ltd., Patna
CIN - U40102BRC1612SGCH00009
[SAVE ENERGY FOR BENEFIT OF SELF AND NATION]
Head Office, Vidya Bhawan, Bailey Road, Patna - 800011,

Letter No. 106
REG. NO. BSRPTCO/BAILEY/007/2022

Dated 14-02-2022

From,

Chief Engineer (System Operation)
Bihar State Power Transmission Co. Ltd.

To

AGM- O&M (Commercial)
Bihar Grid Company Limited
2nd floor, Akanksha place, Boring Road
Patna, 800001

Sub: Installation of AFT meter at all the interface points and communication of AFT meter data from all the points for the purpose of Energy Accounting.

Ref: BSC's Tariff order for FY 2021-22 & FY 2022-23.

Sr,

With reference to the subject mentioned above, it is requested to install AFT meters with communication facilities at all the interface points in the upcoming GIS-Net.

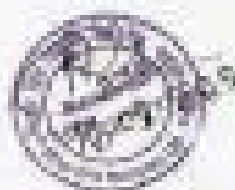
- 1) 400/220kV Kachhara
- 2) 400/220kV Jahanpur

Further, in compliance of directive issued by the Hon'ble BERC in respective tariff order mentioned under reference, BSC's is requested to make the joint protocol with STU before charging of all its upcoming GIS for finalisation of all interface points so that transmission loss may be calculated properly.

This should be treated as most URGENT.

Yours faithfully

(A. K. Choudhary)
Chief Engineer (System Operation)



Journal of Management Inquiry 20(4) 409–424

[illegible]

Health Care Compliance and HIPAA - 2019

SL No.	Item/Description	Analysis and Score Status	Q	10-15 Days	1-3 Months	3-6 Months	6-12 Months	12-24 Months	24-36 Months	36-48 Months	48-60 Months	60-72 Months	72-84 Months	84-96 Months	96-108 Months	108-120 Months	120-132 Months	132-144 Months	144-156 Months	156-168 Months	168-180 Months	180-192 Months	192-204 Months	204-216 Months	216-228 Months	228-240 Months	240-252 Months	252-264 Months	264-276 Months	276-288 Months	288-300 Months	300-312 Months	312-324 Months	324-336 Months	336-348 Months	348-360 Months	360-372 Months	372-384 Months	384-396 Months	396-408 Months	408-420 Months	420-432 Months	432-444 Months	444-456 Months	456-468 Months	468-480 Months	480-492 Months	492-504 Months	504-516 Months	516-528 Months	528-540 Months	540-552 Months	552-564 Months	564-576 Months	576-588 Months	588-600 Months	600-612 Months	612-624 Months	624-636 Months	636-648 Months	648-660 Months	660-672 Months	672-684 Months	684-696 Months	696-708 Months	708-720 Months	720-732 Months	732-744 Months	744-756 Months	756-768 Months	768-780 Months	780-792 Months	792-804 Months	804-816 Months	816-828 Months	828-840 Months	840-852 Months	852-864 Months	864-876 Months	876-888 Months	888-900 Months	900-912 Months	912-924 Months	924-936 Months	936-948 Months	948-960 Months	960-972 Months	972-984 Months	984-996 Months	996-1008 Months	1008-1020 Months	1020-1032 Months	1032-1044 Months	1044-1056 Months	1056-1068 Months	1068-1080 Months	1080-1092 Months	1092-1104 Months	1104-1116 Months	1116-1128 Months	1128-1140 Months	1140-1152 Months	1152-1164 Months	1164-1176 Months	1176-1188 Months	1188-1200 Months	1200-1212 Months	1212-1224 Months	1224-1236 Months	1236-1248 Months	1248-1260 Months	1260-1272 Months	1272-1284 Months	1284-1296 Months	1296-1308 Months	1308-1320 Months	1320-1332 Months	1332-1344 Months	1344-1356 Months	1356-1368 Months	1368-1380 Months	1380-1392 Months	1392-1404 Months	1404-1416 Months	1416-1428 Months	1428-1440 Months	1440-1452 Months	1452-1464 Months	1464-1476 Months	1476-1488 Months	1488-1500 Months	1500-1512 Months	1512-1524 Months	1524-1536 Months	1536-1548 Months	1548-1560 Months	1560-1572 Months	1572-1584 Months	1584-1596 Months	1596-1608 Months	1608-1620 Months	1620-1632 Months	1632-1644 Months	1644-1656 Months	1656-1668 Months	1668-1680 Months	1680-1692 Months	1692-1704 Months	1704-1716 Months	1716-1728 Months	1728-1740 Months	1740-1752 Months	1752-1764 Months	1764-1776 Months	1776-1788 Months	1788-1800 Months	1800-1812 Months	1812-1824 Months	1824-1836 Months	1836-1848 Months	1848-1860 Months	1860-1872 Months	1872-1884 Months	1884-1896 Months	1896-1908 Months	1908-1920 Months	1920-1932 Months	1932-1944 Months	1944-1956 Months	1956-1968 Months	1968-1980 Months	1980-1992 Months	1992-2004 Months	2004-2016 Months	2016-2028 Months	2028-2040 Months	2040-2052 Months	2052-2064 Months	2064-2076 Months	2076-2088 Months	2088-2100 Months	2100-2112 Months	2112-2124 Months	2124-2136 Months	2136-2148 Months	2148-2160 Months	2160-2172 Months	2172-2184 Months	2184-2196 Months	2196-2208 Months	2208-2220 Months	2220-2232 Months	2232-2244 Months	2244-2256 Months	2256-2268 Months	2268-2280 Months	2280-2292 Months	2292-2304 Months	2304-2316 Months	2316-2328 Months	2328-2340 Months	2340-2352 Months	2352-2364 Months	2364-2376 Months	2376-2388 Months	2388-2400 Months	2400-2412 Months	2412-2424 Months	2424-2436 Months	2436-2448 Months	2448-2460 Months	2460-2472 Months	2472-2484 Months	2484-2496 Months	2496-2508 Months	2508-2520 Months	2520-2532 Months	2532-2544 Months	2544-2556 Months	2556-2568 Months	2568-2580 Months	2580-2592 Months	2592-2604 Months	2604-2616 Months	2616-2628 Months	2628-2640 Months	2640-2652 Months	2652-2664 Months	2664-2676 Months	2676-2688 Months	2688-2700 Months	2700-2712 Months	2712-2724 Months	2724-2736 Months	2736-2748 Months	2748-2760 Months	2760-2772 Months	2772-2784 Months	2784-2796 Months	2796-2808 Months	2808-2820 Months	2820-2832 Months	2832-2844 Months	2844-2856 Months	2856-2868 Months	2868-2880 Months	2880-2892 Months	2892-2904 Months	2904-2916 Months	2916-2928 Months	2928-2940 Months	2940-2952 Months	2952-2964 Months	2964-2976 Months	2976-2988 Months	2988-3000 Months	3000-3012 Months	3012-3024 Months	3024-3036 Months	3036-3048 Months	3048-3060 Months	3060-3072 Months	3072-3084 Months	3084-3096 Months	3096-3108 Months	3108-3120 Months	3120-3132 Months	3132-3144 Months	3144-3156 Months	3156-3168 Months	3168-3180 Months	3180-3192 Months	3192-3204 Months	3204-3216 Months	3216-3228 Months	3228-3240 Months	3240-3252 Months	3252-3264 Months	3264-3276 Months	3276-3288 Months	3288-3300 Months	3300-3312 Months	3312-3324 Months	3324-3336 Months	3336-3348 Months	3348-3360 Months	3360-3372 Months	3372-3384 Months	3384-3396 Months	3396-3408 Months	3408-3420 Months	3420-3432 Months	3432-3444 Months	3444-3456 Months	3456-3468 Months	3468-3480 Months	3480-3492 Months	3492-3504 Months	3504-3516 Months	3516-3528 Months	3528-3540 Months	3540-3552 Months	3552-3564 Months	3564-3576 Months	3576-3588 Months	3588-3600 Months	3600-3612 Months	3612-3624 Months	3624-3636 Months	3636-3648 Months	3648-3660 Months	3660-3672 Months	3672-3684 Months	3684-3696 Months	3696-3708 Months	3708-3720 Months	3720-3732 Months	3732-3744 Months	3744-3756 Months	3756-3768 Months	3768-3780 Months	3780-3792 Months	3792-3804 Months	3804-3816 Months	3816-3828 Months	3828-3840 Months	3840-3852 Months	3852-3864 Months	3864-3876 Months	3876-3888 Months	3888-3900 Months	3900-3912 Months	3912-3924 Months	3924-3936 Months	3936-3948 Months	3948-3960 Months	3960-3972 Months	3972-3984 Months	3984-3996 Months	3996-4008 Months	4008-4020 Months	4020-4032 Months	4032-4044 Months	4044-4056 Months	4056-4068 Months	4068-4080 Months	4080-4092 Months	4092-4104 Months	4104-4116 Months	4116-4128 Months	4128-4140 Months	4140-4152 Months	4152-4164 Months	4164-4176 Months	4176-4188 Months	4188-4200 Months	4200-4212 Months	4212-4224 Months	4224-4236 Months	4236-4248 Months	4248-4260 Months	4260-4272 Months	4272-4284 Months	4284-4296 Months	4296-4308 Months	4308-4320 Months	4320-4332 Months	4332-4344 Months	4344-4356 Months	4356-4368 Months	4368-4380 Months	4380-4392 Months	4392-4404 Months	4404-4416 Months	4416-4428 Months	4428-4440 Months	4440-4452 Months	4452-4464 Months	4464-4476 Months	4476-4488 Months	4488-4500 Months	4500-4512 Months	4512-4524 Months	4524-4536 Months	4536-4548 Months	4548-4560 Months	4560-4572 Months	4572-4584 Months	4584-4596 Months	4596-4608 Months	4608-4620 Months	4620-4632 Months	4632-4644 Months	4644-4656 Months	4656-4668 Months	4668-4680 Months	4680-4692 Months	4692-4704 Months	4704-4716 Months	4716-4728 Months	4728-4740 Months	4740-4752 Months	4752-4764 Months	4764-4776 Months	4776-4788 Months	4788-4800 Months	4800-4812 Months	4812-4824 Months	4824-4836 Months	4836-4848 Months	4848-4860 Months	4860-4872 Months	4872-4884 Months	4884-4896 Months	4896-4908 Months	4908-4920 Months	4920-4932 Months	4932-4944 Months	4944-4956 Months	4956-4968 Months	4968-4980 Months	4980-4992 Months	4992-5004 Months	5004-5016 Months	5016-5028 Months	5028-5040 Months	5040-5052 Months	5052-5064 Months	5064-5076 Months	5076-5088 Months	5088-5100 Months	5100-5112 Months	5112-5124 Months	5124-5136 Months	5136-5148 Months	5148-5160 Months	5160-5172 Months	5172-5184 Months	5184-5196 Months	5196-5208 Months	5208-5220 Months	5220-5232 Months	5232-5244 Months	5244-5256 Months	5256-5268 Months	5268-5280 Months	5280-5292 Months	5292-5304 Months	5304-5316 Months	5316-5328 Months	5328-5340 Months	5340-5352 Months	5352-5364 Months	5364-5376 Months	5376-5388 Months	5388-5400 Months	5400-5412 Months	5412-5424 Months	5424-5436 Months	5436-5448 Months	5448-5460 Months	5460-5472 Months	5472-5484 Months	5484-5496 Months	5496-5508 Months	5508-5520 Months	5520-5532 Months	5532-5544 Months	5544-5556 Months	5556-5568 Months	5568-5580 Months	5580-5592 Months	5592-5604 Months	5604-5616 Months	5616-5628 Months	5628-5640 Months	5640-5652 Months	5652-5664 Months	5664-5676 Months	5676-5688 Months	5688-5700 Months	5700-5712 Months	5712-5724 Months	5724-5736 Months	5736-5748 Months	5748-5760 Months	5760-5772 Months	5772-5784 Months	5784-5796 Months	5796-5808 Months	5808-5820 Months	5820-5832 Months	5832-5844 Months	5844-5856 Months	5856-5868 Months	5868-5880 Months	5880-5892 Months	5892-5904 Months	5904-5916 Months	5916-5928 Months	5928-5940 Months	5940-5952 Months	5952-5964 Months	5964-5976 Months	5976-5988 Months	5988-6000 Months	6000-6012 Months	6012-6024 Months	6024-6036 Months	6036-6048 Months	6048-6060 Months	6060-6072 Months	6072-6084 Months	6084-6096 Months	6096-6108 Months	6108-6120 Months	6120-6132 Months	6132-6144 Months	6144-6156 Months	6156-6168 Months	6168-6180 Months	6180-6192 Months	6192-6204 Months	6204-6216 Months	6216-6228 Months	6228-6240 Months	6240-6252 Months	6252-6264 Months	6264-6276 Months	6276-6288 Months	6288-6300 Months	6300-6312 Months	6312-6324 Months	6324-6336 Months	6336-6348 Months	6348-6360 Months	6360-6372 Months	6372-6384 Months	6384-6396 Months	6396-6408 Months	6408-6420 Months	6420-6432 Months	6432-6444 Months	6444-6456 Months	6456-6468 Months	6468-6480 Months	6480-6492 Months	6492-6504 Months	6504-6516 Months	6516-6528 Months	6528-6540 Months	6540-6552 Months	6552-6564 Months	6564-6576 Months	6576-6588 Months	6588-6600 Months	6600-6612 Months	6612-6624 Months	6624-6636 Months	6636-6648 Months	6648-6660 Months	6660-6672 Months	6672-6684 Months	6684-6696 Months	6696-6708 Months	6708-6720 Months	6720-6732 Months	6732-6744 Months	6744-6756 Months	6756-6768 Months	6768-6780 Months	6780-6792 Months	6792-6804 Months	6804-6816 Months	6816-6828 Months	6828-6840 Months	6840-6852 Months	6852-6864 Months	6864-6876 Months	6876-6888 Months	6888-6900 Months	6900-6912 Months	6912-6924 Months	6924-6936 Months	6936-6948 Months	6948-6960 Months	6960-6972 Months	6972-6984 Months	6984-6996 Months	6996-7008 Months	7008-7020 Months	7020-7032 Months	7032-7044 Months	7044-7056 Months	7056-7068 Months	7068-7080 Months	7080-7092 Months	7092-7104 Months	7104-7116 Months	7116-7128 Months	7128-7140 Months	7140-7152 Months	7152-7164 Months	7164-7176 Months	7176-7188 Months	7188-7200 Months	7200-7212 Months	7212-7224 Months	7224-7236 Months	7236-7248 Months	7248-7260 Months	7260-7272 Months	7272-7284 Months	7284-7296 Months	7296-7308 Months	7308-7320 Months	7320-7332 Months	7332-7344 Months	7344-7356 Months	7356-7368 Months	7368-7380 Months	7380-7392 Months	7392-7404 Months	7404-7416 Months	7416-7428 Months	7428-7440 Months	7440-7452 Months	7452-7464 Months	7464-7476 Months	7476-7488 Months	7488-7500 Months	7500-7512 Months	7512-7524 Months	7524-7536 Months	7536-7548 Months	7548-7560 Months	7560-7572 Months	7572-7584 Months	7584-7596 Months	7596-7608 Months	7608-7620 Months	7620-7632 Months	7632-7644 Months	7644-7656 Months	7656-7668 Months	7668-7680 Months	7680-7692 Months	7692-7704 Months	7704-7716 Months	7716-7728 Months	7728-7740 Months	7740-7752 Months	7752-7764 Months	7764-7776 Months	7776-7788 Months	7788-7800 Months	7800-7812 Months	7812-7824 Months	7824-7836 Months	7836-7848 Months	7848-7860 Months	7860-7872 Months	7872-7884 Months	7884-7896 Months	7896-7908 Months	7908-7920 Months	7920-7932 Months	7932-7944 Months	7944-7956 Months	7956-7968 Months	7968-7980 Months	7980-7992 Months	7992-8004 Months	8004-8016 Months	8016-8028 Months	8028-8040 Months	8040-8052 Months	8052-8064 Months	8064-8076 Months	8076-8088 Months	8088-8100 Months	8100-8112 Months	8112-8124 Months	8124-8136 Months	8136-8148 Months	8148-8160 Months	8160-8172 Months	8172-8184 Months	8184-8196 Months	8196-8208 Months	8208-8220 Months	8220-8232 Months	8232-8244 Months	8244-8256 Months	8256-8268 Months	8268-8280 Months	8280-8292 Months	8292-8304 Months	8304-8316 Months	8316-8328 Months	8328-8340 Months	8340-8352 Months	8352-8364 Months	8364-8376 Months	8376-8388 Months	8388-8400 Months	8400-8412 Months	8412-8424 Months	8424-8436 Months	8436-8448 Months	8448-8460 Months	8460-8472 Months	8472-8484 Months	8484-8496 Months	8496-8508 Months	8508-8520 Months	8520-8532 Months	8532-8544 Months	8544-8556 Months	8556-8568 Months	8568-8580 Months	8580-8592 Months	8592-8604 Months	8604-8616 Months	8616-8628 Months	8628-8640 Months	8640-8652 Months	8652-8664 Months	8664-8676 Months	8676-8688 Months	8688-8700 Months	8700-8712 Months	8712-8724 Months	8724-8736 Months	8736-8748 Months	8748-8760 Months	8760-877
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Sl. No.	VMS Name	Subcategory (V)	Amount in Rupee													Remarks	
			400 in L. lot	1000 (100 in 1000)	1000 (1000 in 1000)	1000 (1000 in 1000)	1000 (1000 in 1000)	1000 (1000 in 1000)	1000 (1000 in 1000)	1000 (1000 in 1000)	1000 (1000 in 1000)	1000 (1000 in 1000)	1000 (1000 in 1000)	1000 (1000 in 1000)	1000 (1000 in 1000)		
1	General	1000 (1000)				2	2	2	2	2				2	2	1	0.00% required
2	General	1000 (1000)				8	2	2	2	2				2	2	1	0.00% for 1000, 1000 in and 1000 for 1000
3	General	1000 (1000)				4	2	2	2	2				2	2	1	0.00% required
4	General	1000 (1000)				8	2	2	2	2				2	2	1	0.00% required
5	General	1000 (1000)				4	2	2	2	2				2	2	1	0.00% required
6	General	1000 (1000)				2	2	2	2	2				2	2	1	0.00% required
7	General	1000 (1000)				4	2	2	2	2				2	2	1	0.00% required
8	General	1000 (1000)				4	2	2	2	2				2	2	1	0.00% for 1000, 1000 in and 1000 for 1000
9	General	1000 (1000)				4	2	2	2	2				2	2	1	0.00% for 1000, 1000 in and 1000 for 1000 and 1000 for 1000
10	General	1000 (1000)	4	2	2	8	2	2	2	2	2	2	2	2	2	1	0.00% for 1000, 1000 in and 1000 for 1000 and 1000 for 1000
11	General	1000 (1000)	4	2	2	8	2	2	2	2	2	2	2	2	2	1	0.00% for 1000, 1000 in and 1000 for 1000 and 1000 for 1000
12	General	1000 (1000)	4	2	2	8	2	2	2	2	2	2	2	2	2	1	0.00% for 1000, 1000 in and 1000 for 1000 and 1000 for 1000
13	General	1000 (1000)				2	2				2	2	2	2	2	1	0.00% required for 1000, 1000 in and 1000 for 1000
14	General	1000 (1000)				20	2			20				20	2		0.00% required for 1000, 1000 in and 1000 for 1000
Grand Total			4	2	4	20	2	2	2	2	2	2	2	2	2	1	

PRICE SCHEDULE

supply, installation, testing & commissioning of interface range Meter (IRM) along with Automated Meter Reading (AMR) as per customer guidelines at various sub-stations in other toll company limited (price)

Sl. No.	Item Description	total value
1	Supply	7,00,00,000.00
2	Execution & Commissioning	1,77,50,000.00
3	AMR for 5 Years	1,00,00,000.00
4	Energy Audit & Report generation for 5 Years	4,00,00,000.00
	Total	14,17,50,000.00

Notes:

- All prices are inclusive of GST.

100

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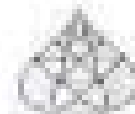
Supply Installation Testing Commissioning of Intermittent Energy Meters (IEM) along with automated Meter reading (AMR) as per IEM/AMR guidelines of various Grid Stations in Bharat Company Limited (BCL)

Service Part

Sl. No.	Particulars/Item	Unit	Quant. (duration in Yr)	Unit Price (Rs.)	LT1 %	LT1 amount (Rs.)	LT2/LT3 price (Rs.)	Total/billed price
A.	AMR Service		in Yr.	Rs.	%	Rs.	Rs.	
1	Monthly service charge for Contract and Energy Accounting and Audit of the entire transmission system (generation & network) of various regions, sub regions, sub-division & monitoring etc for 8 years as per requirement.	Rs.	180	1st Year	15,588.00	20%	3,117.60	18,705.60.00
		Rs.	180	2nd Year	15,800.00	20%	3,160.00	18,960.00.00
		Rs.	180	3rd year	16,000.00	20%	3,200.00	19,200.00.00
		Rs.	180	4th year	16,400.00	20%	3,280.00	19,680.00.00
		Rs.	180	5th year	16,800.00	20%	3,360.00	20,160.00.00
Sub-Total (a)								98,705.60.00
B	Total For Energy & Metering provision							
1	Monthly service charge for comprehensive implementation of the whole AMR system including material, equipment, manpower for work of AMR for 8 years post and testing & RQC, performance cost.	Rs.	1	1st Year	87,12,508	20%	17,42,501.60	1,04,55,009.60
		Rs.	1	2nd Year	89,89,884	20%	17,97,976.79	1,07,87,860.79
		Rs.	1	3rd year	92,31,884	20%	18,46,381.68	1,10,78,265.68
		Rs.	1	4th year	94,94,547	20%	18,98,909.49	1,13,93,456.49
		Rs.	1	5th year	96,57,589	20%	19,31,517.78	1,15,89,106.78
Sub-Total (b)								4,37,55,083.25
Total for Energy & Metering								1,42,26,688.25

Note:- LT1-20% of the service contract value, subject to the fact that it is not less than 4% of the service fee. Monthly fee has to be paid in the month end according to the quantity for AMR is considered as 200nos.

SHANGHAI CHIB COMPANY LIMITED
SHANGHAI CHIB COMPANY LIMITED
 Market Place, 2nd Floor, Tower, Road, Floor, Room,
 CHINA 200000
NOTICE INVITING TENDER



SHANGHAI CHIB COMPANY LIMITED

Date: 10.01.2026

SHANGHAI CHIB COMPANY LIMITED
 (Please refer to Shanghai Chib Company Limited Company Meeting Minutes Document)
 SHANGHAI CHIB COMPANY LIMITED notice market bids for the following work from eligible
 bidders.

PART	Name of Packages	Estimated Cost (in RMB) (approximate period) Tender Document Code 1.000/No Response	Last date for bid submission (date of close of bid opening)
A	Supply, installation, testing & commissioning of RFT equipment, system for implementation of SAMART project of SHANGHAI gasification including AME and Energy Audit at various steel industries in China Steel Company Limited.	RMB 1,100.00 (only) RMB 1,100.00 (only) RMB 1,100.00 (only) RMB 1,100.00 (only)	Up to 11.01.2026 at 10.00 AM On 11.01.2026 at 10.00 AM

Note: (a) Tender Documents commence from 10.01.2026 to 11.01.2026 on all working days.
 (b) Purchase of Tender Documents: From 10.01.2026 at office address mentioned above.
 (c) Cost of Tender Documents shall be paid through Demand Draft only in favour of "Shanghai Chib Company
 Limited, Payable at Patna".

The detailed Qualifying Requirements (QR) are given in the bidding document of the said package.
 For submission of the bid, bidders will be required to purchase bid documents duly authenticated by the
 executive issuing the documents. This notice will also be available on SHCIL website www.shangchib.com
 For detailed NIT and bid documents please contact SHCIL (CHINA), HCCCL, at the address given above or on
 telephone no: 0672-25, 38477.

[Signature]

- *[Signature]*
 - *[Signature]*
[Signature]

BIHAR GRID COMPANY LIMITED
(A JV of BSEPTCL & POWERGRID)
Shankar Place, 2nd Floor, Boring Road, Patna-800001
CIN: U40100NR2603PLC01772



बिहार गिड

NIT DATE EXTENSION NOTICE

Ref. No.: JV/PT/BG/C&M/25-26/ OT-02/Extension

Date: 24.02.2026

In continuation to NIT Ref. No.: JV/PT/BG/C&M/25-26/ OT-02 Dated 14.01.2026, the bid sale, submission & opening date has been extended as below:-

<i>Name of Packages</i>	<i>Extended date for sale of Tender Documents</i>
	<i>Last date for bid submission Date & Time of Bid opening</i>
Supply, Installation, Testing & Commissioning of ABT compliant meters for implementation of SAMANT guidelines of BSEPTCL guidelines including AMC and Energy Audit at various Grid substation in Bihar Grid Company Limited	Up to 14.03.2026 at 18:00 Hrs.
	Up to 21.03.2026 at 15:00 Hrs.
	Up to 21.03.2026 at 15:30 Hrs.

All other terms and conditions remain the same. Extension notice may be also seen on BGCL website- www.bihargrid.co.in.

Sr. G. M. (Tech)

Sr. G. M. (Tech)

Sr. G. M. (Tech)

Sr. G. M. (Tech)

Sr. G. M. (Tech)

BIHAR GRID COMPANY LIMITED
(A JV of BSEPTCL & POWERGRID)
Alankar Place, 7th Floor, Boring Road, Patna-800001
CIN: J01008RG2013PLC019722
NIT DATE EXTENSION-II



बिहार गिड

Ref. No.: JV/PT/IG/C&M/25-26/OT-02/1-10-01

Dated: 25.03.2026

In continuation to NIT Ref. No.: JV/PT/IG/C&M/25-26/OT-02 Dated: 14.01.2025, the bid sale, submission & opening date has been extended as below:-

<i>Name of Package</i>	<i>Extended Last date for:-</i>
Supply, installation, Testing & Commissioning of AMI compliant meters for implementation of SAMST guidelines of BSEPTCL guidelines including AMI and Energy Audit at various feed substations in Bihar Grid Company Limited.	Bid Sale: Up to 07.04.2026 at 18:00 Hrs. Bid Submission: Up to 13.04.2026 at 15:00 Hrs. Bid Opening: On 13.04.2026 at 15:00 Hrs.

This notice & NIT is also available on BGCIL website www.bihargrid.co.in. For detailed NIT and bid documents please contact DGM (C&M), BGCIL, at the address given above.

[Signature]
DGM (C&M)

[Signature]
DGM (C&M)

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DGM (C&M)

→ 247 (IT) -



Technical offer for Supply, Installation, Testing &
Commissioning of Interface Energy Meters (IEM) along
with Automated Meter Reading (AMR) as per SAMAST
guidelines at various
Substations of
Bihar Grid Company Ltd

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1. Background

- 1.1 The National Grid comprising of regional and State power systems is operating as a single synchronous system since December 2018. While the grid reliability and management has improved significantly along with the frequency profile, several building blocks of the developed grid are yet to be put in place. One of them is comprehensive accounting and settlement system that streamlines trade and exchange of power across States and regional boundaries. Government of India put an ambitious target for ramping up the RES capacity to 175GW by 2022. Taking cognizance of the variable and uncertain nature of solar and wind sources, the Central Electricity Regulatory Commission (CERC) notified the Framework on Forecasting, Scheduling and Imbalance Handling for Variable Renewable Energy Sources (Wind and Solar) on 07 August 2015.
- 1.2 In this context, it is to mention here that The Central Electricity Regulatory Commission (CERC) has also adopted the recommendations by Technical committee of the Forum of regulators (FOR) suggested vide the "Scheduling, Accounting, Metering and Settlement of Transactions in Electricity (SAMASTE)/report published in July 16 and has suggested for implementation of the recommendations of this report by State Load dispatch Centers/State Transmission Utilities under the supervision of respective State regulatory commissions.
- 1.3 BGCIL intends to implement an AMR system for transmission & sub transmission system whose scope of work is supply, installation & commissioning of necessary hardware and software (from 90KV level up to 33/22/11KV feeder level in the respective substations) throughout the geographical domain of BGCIL.
- 1.4 A large number of SEMs installed in the state are more than 5 / 10 years old and are due for testing / replacement. Now, it has decided to replace the entire fleet of existing SEMs (15-min recording) with Interface Energy Meters IEM (5-min interval) and implement the Automated Meter Reading, Meter Data Processing & energy accounting system under recommendations of the FOR Report (Scheduling, Accounting, Metering and Settlement of Transactions in Electricity (SAMASTE).
- 1.5 BGCIL wants to implement IEM metering, AMR system for transmission & sub transmission system whose scope of work is supply, installation & commissioning of necessary hardware and software (from 220kV level up to 33kV feeder level in the respective substations) throughout the geographical domain of the project.

2. Scope of activities

- 2.1 Considering the above mentioned requirements, following activities are envisaged by BGCIL against the scope of work:
 - 2.1.1 Supply, installation/replacement and commissioning of IEM as per the specification attached.
 - 2.1.2 Supply, installation/replacement and commissioning of IEM with class A power quality monitoring features in compliance with IEA Technical Standard for Connectivity to the Grid (Amendment 2010) as per specification attached.
 - 2.1.3 Supply, installation and commissioning of DAS/ AMR system for meter data
 - 2.1.4 AMC for hardware and ATS for software for 5 years.

3. Deployment architecture

- 3.1 The ART grid metering system needs to be recognized as an integrated metering system, where all meters need to act in synchronism to deliver comprehensive benefits. There is a need of a system architecture as mentioned in the below Figure

- 3.2 Scheme shown below is tentative and only pictorial representation. Actual no. of infrastructure and solution shall be provided in price bidding documents.

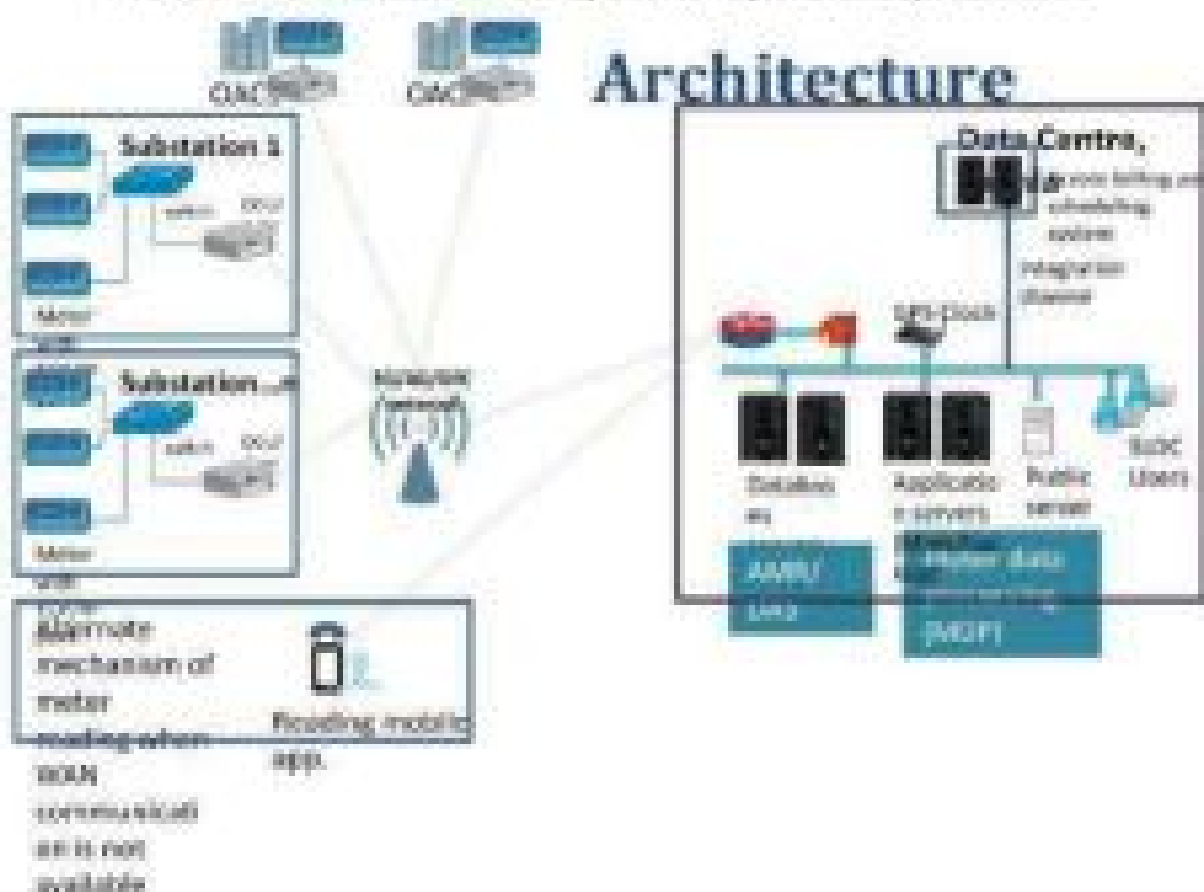


Figure 1 : Deployment architecture at substation and data centre

- 1.4 At Local Substation:**
- (i) **Substation meters:** IEC meters at each substation having the facility of additional VDP/RS port to provide reliable and fast communication network at substation.
 - (ii) **LAM switches/routers /firewalls:** These devices at each substation are required to provide the connectivity of GPRS/GPRS/CDMA/4G network from each substation to central data centre for data acquisition and analysis purpose.
 - (iii) **DCU/gateway:** Data concentrator unit (DCU)/communication gateway shall also be installed at each substation. In view of robust and reliable monitoring requirements, DCU/gateway needs to be considered for each substation.
- 1.5 Central Data Centre:**
- (i) **Database Server:** There is a single database server maintained for complete system for "AMR/DAS" for data storage and backup;stand by server shall also be installed to increase the reliability of the system.
 - (ii) **Application Server:** Since the applications should be web/browser based, an Internet Information Server needs to be deployed on a separate server named as application server.

- 5.8.2 Providing energy data to central server
- 5.8.3 Intelligence to synchronise IEM's clock with GPS clock located at CDC.
- 5.9 Detailed technical hardware and functional requirements of DCU/gateway are attached in **Annexure II.**
- 5.10 **Communication system:** Communication system to be used for transfer of data from DCU/gateway to central server at CDC may be Optic Fibre-OPC/OPGW/DMGW/VSAT/MPLS/GPRS/3G/4G. Bidder is free to suggest alternative communication media if it is more efficient and cost effective.
- 5.11 **Central meter data collection system (AMR/DAS):** A Central meter data collecting system to be provided at SLDC should manage all functionalities of collection of data through DCUs/gateways, validation and verification of the data, storage of the data in Standard DBMS such as SQL/ORACLE etc. database and management of the complete AMR system.
- 5.12 The responsibility of providing data up to CDC (including all the hardware in between) shall be the responsibility of the bidder only.
- 5.13 All required hardware devices like Database servers, applications servers, routers, firewall etc. shall be supplied, installed and commissioned by bidder at central data centre (CDC).
- 5.14 A back-up/redundant server is required to reduce the risk of the data loss due to undefined failures at the central data centre. Backup server needs to take the regular backup of the data on a pre-defined time from the main DB server. Whenever any failures happen to the main server, backup server can be used to run the application and regular activities but it may take 30min. to 1 hr. time for configure the back-up server as a main server for some duration and whenever the main server shall restore then application starts using the main server.
- 5.15 A GPS clock shall also be installed at CDC and bidder's system responsibility is to perform the time sync of all servers, DCU and meters on a predefined frequency by referencing GPS clock time.
- 5.16 An application of meter data collection (AMR/DAS) shall be installed at central data centre to get all meter data (consumption, energy etc.) from each substation through 3G/4G/OPC/DMGW/OPGW network at a desired frequency of say daily. Software shall display the data in tabular, graphical format for easy viewing. Meters have the capability to log the load survey data at every 5/15 min. so load survey data reading shall be used for further DSM reporting.
- 5.17 All meters shall be assigned with an individual IP over TCP/IP port and same configurations shall be provided at central server and then in DCU/gateway.
- 5.18 In case, some meter data is not possible to get from central server due to any communication and other issues then substation PC can also be used to access a weblink to upload the CMRI and converted data in to the system/weblink which provide automatically provision to send the meter data the central server.
- 5.19 A monitoring application (NMS) shall be provided to track the IP based device & system status for health monitoring at central data centre. This application shall help user to check the status of the connected and disconnected devices like IEMs, DCU, switches, servers etc.
- 5.20 There are other utility offices which may need the meter data for some specific purpose and the accessibility of the limited part of the application with limited user rights to those offices shall also be available like for Transco, SLDC and Discom users etc.
- 5.21 Deployed system shall be capable to cater 100 DCUs (considering 10 meters per DCU) and CDCs application shall have a provision to handle max. 1,000 no. of meters. Data collection frequency is considered hourly from data centre (instant, LS, event etc.) while 1/5min. at each substation (instant and event).

- E.32 As the end-to-end metering system shall be supplied by the single successful bidder and all meters data shall be available at CDC through AMR/DAS system.
- E.33 While performing meter data collection activities, any discrepancy or missing of data in any particular block or wrong raw data format shall be displayed and downloaded in the form of a report. And bidder has the responsibility to recollect the meter data to ensure the weekly DSM billing and provided to other systems through interfaces.
- E.34 Software shall have the options to generate the list of Meter IDs whose data is not available, List of meter IDs whose data is available for day wise for the required period.
- E.35 Validated data shall be provided to the DSM module (third party) which shall compute deviation of regional entity by comparing the actual injection/drawal with its interchange schedule. It shall also compute the applicable deviation charges and generate the reports that include time block wise normal deviation charges, additional deviation charges, capped deviation charges, aggregate deviation charges etc.

Integration with DSM module may require some development and customisation by the bidder which shall be discussed during detailed engineering.
- E.36 SLDC/Tranco users may require different set of reports and dashboards for different users and perspective therefore during detailed engineering, all requirements shall be discussed and finalised before final deployment by our service team.

6 Transition and integration phase:

- 6.1 Detailed engineering phase should be considered to identify the detailed requirements of project implementation for transition and final deployment. It should also identify the integration requirements with existing & to be deployed system for DSM computation, billing and energy audit system etc.
- 6.2 During this phase, integration points of DAS module with other third party module along with integration methodology should be mutually agreed and finalised.
- 6.3 Presently the time period for scheduling and settlement at ISTS level is 15-min. Until the amendments for 5-min settlement in the appropriate regulations come, the settlement at the interstate level shall continue to be done at 15-min interval.

7 Delivery plan:

- T.1 All required software module like DAS shall be installed and commissioned at SLDC Patna and all customer specific database creation and configurations shall be done at site only.
- T.2 Before the commissioning and final configurations, Bidder's execution team shall share the inception report of the project which shall cover deployment architecture, flow of data acquisition process, integration techniques, dashboards and shall also discuss the expected changes so that customer specific reports can be created.
- T.3 Detailed requirement understanding shall be developed with SLDC and BGL team during detailed engineering.
- T.4 Bidder's team shall work on customer specific requirements and perform factory acceptance (FAT) test then shall deploy the final solution field/site.
- T.5 After commissioning, some identified users of utility team shall validate the application module against the requirement captured which shall be considered as site acceptance test (SAT).

- 7.4 Project execution duration should be 12 months from the date of LOR till the handover and training activities.

B AMC and ATS for 5 years

- 8.1 Annual maintenance contract (AMC) for supplied hardware and Annual technical support (ATS) for software shall be provided by the successful bidder.
- 8.2 A web-based problem/defect reporting tool where SLDC officials/bidder's team (at site) who shall execute the system, can log the issues with the flag of the severity level by using provided user name & pwd.
- 8.3 Bidder's team shall check the issues and try to resolve as per the process and escalate to another level if not resolved by that level of user.
- 8.4 A dedicate manpower shall be available at SLDC central office during this AMC/ATS tenure for coordination with substation personal, SLDC users and backend team of bidder for issue resolution on time. He/she is also being responsible to support SLDC officials for the day to day activities using system deployed at data centre.

Annual maintenance contract (AMC) for supplied hardware for 3 years

- 8.5 Annual maintenance contract (AMC)...
- 8.6 The aim of AMC is to ensure the proper functioning of the supplied devices either through rectification/correction or via replacement under the specified network environment.
- 8.7 Initially, this contract shall be for 3 years from the date of service agreement and can be further extended on mutually agreed terms & conditions.
- 8.8 The consumables and operating expenses are not covered in maintenance cost, ex. printer drum and ink charges, Stationeries, Batteries maintenance, data network charges etc. these items shall be managed by utility only.
- 8.9 Service and support shall be provided to utility in accordance with the terms indicated in this document/tender. In case, any service is chargeable / out of scope then it shall not be part of technical support. Support availability for a particular product version is subject to change at any time without prior notice. To fix any service request if any upgrade is required then new version shall be provided based on agreed terms and conditions only.
- 8.10 The law of force measure is applicable on AMC i.e. any damage caused due to short circuit, earth leakage, earthquake, fire etc. would be out of maintenance contract.
- 8.11 Adequate safety and security measures shall be in customer account, any theft, damage by mishandling etc. by unauthorised person shall not be covered in the maintenance contract.
- 8.12 If any seals are found to be broken during maintenance period then, warranty of these items shall be ceased to exist with immediately.
- 8.13 Hardware technology downgrade/upgrade is not the part of the AMC contract as a common practice but it is only as per contract conditions or mutually agreement between both the parties.
- 8.14 Hardware maintenance: (if supplied by us only)
- Corrective maintenance
 - o Trouble shooting of failure of implemented functionality
 - o Identify, isolate, and rectify a fault so that the failed equipment, machine, or system can be restored to an operational condition.
 - o Hardware can be replaced with the same spec. and upgraded spec. which is fully compatible with the existing system after mutual agreement.

8.15 Hardware specific activities:

Following are the list of activities that should be carried out during AMC period:

Activity	Scope Description
Hardware installation	• Replacement of faulty hardware (with warranty item/ spares whichever applicable) including meters, 3I-port (if any), DCU/gateway, routers, servers, switches and firewall etc. (if provided by bidder only). • Any alteration or site shifting during maintenance period is not covered in scope. In addition of new substation, installation shall be done by bidder's team as per separate commercials. • New sites addition/sites swapping cases should be discussed and based on mutual agreement maintenance and support shall be provided to new/swapped sites. • Plan for material and coordinate with end user and vendor.
Hardware configuration	• The Procedure for site configuration shall be followed for each of the device and configured accordingly. There shall be mechanism to verify the successful configuration done manually. • Re-configuration of hardware at site like modems, DCU/gateway, routers etc. to take care the change management like new meter configurations in DCU/application. • Ensure its connectivity with central server and raise the network issue to utility team & communication provider/vendor.
Maintenance and Support of brought out items	• The third party hardware to be repaired/replaced as per warranty clauses provided by them only. Bidder to ensure that system is up and running after taking the corrective measures. • Antivirus/SQL/MS office and all other third party licenses shall also be monitored by ATS team during regular visits and interaction with customer and renew of all licenses on time but commercial arrangement shall be mutually discussed with utility for license renew as per the agreement with third party provider. • Adequate number of third party supplied devices to be kept in reserve/stock against the devices whose failure may stop the business operations completely. Ex. Converters, Switch, Modem, SIMS, Data cards, DCU/gateway etc.

Annual technical support (ATS) for software

- E.16** Provide the annual technical support against all supplied software applications to run the project for next 5 years (as per contractual agreement).
- E.17** The renewal of the ATS contract, if agreed by customer, shall be received 3 month prior to the expiry of the ATS support contract.
- E.18** Remote access: Remote access shall be provided to technical support team for remote support, troubleshooting etc. During the entire phase of AMC/ATS support services. It may require additional tools to be installed in the server or a desktop for remote access, troubleshooting and over the air updates to connected nodes such as meters or communication devices depending upon the scope and capability of the system deployed.
- E.19** **Application software maintenance activities**

Following are the list of activities that shall be carried out during the ATS project support:

Activity	Scope Description
Execution & Status Monitoring	- The person shall be available at data centre to execute the application for regular activities. - He shall also monitor data centre and substation applications (if applicable) (from remote or via get the feedbacks from substation person) on regular basis for scheduled maintenance and health monitoring of the application performances like services, database, logs status etc. - Application modules shall execute time sync through existing GPS clock on regular basis but ATS team on monthly basis shall ensure the time sync process and also plan field visit in case of time sync issue with the meters and DCU/gateway at any substation to resolve the issues on monthly basis. - Running daily back up automatically from main server to backup server but bidder's ATS team shall also monitor the data centre regularly to ensure the back-up activity and also check the healthiness of server and log files.
Maintenance	- Rectify bugs that prevent the software from being available / reported by the utility/project team during the usage of the system with respect to each software/deliverables under normal use of the hardware for which it was designed. - Resolution of the bug identified in any type of execution of the software, shall be provided as per below defined process. - Rectification of the bugs shall be provided through patches which shall be installed and checked by ATS-team only. - In case of changes of DSM rules from CERC/SERC then ATS team shall implement the

	new rules and regulation during ATS period (this is not applicable as only DSM module is not in the scope of this tender but anything related to DAS module shall be applicable). ▪ Trouble shooting of failure of implemented functionality. ▪ Identify the problem if data doesn't acquire from some of meters and application features are not working. ▪ Application configuration (if required) likes VI, configuration change and mapping etc. ▪ Testing / User Training / Deployment of patches.
Application installation support	▪ Installation and commissioning to be done on agreed new sites (over and above the specified quantities in order) and linking with central application etc. on chargeable basis. ▪ Provide the software upgrades, patch updates in case of any issue identified or bug resolution. These would be updated at all the places of installations. ▪ In case, due to any unavoidable reasons, utility has to relocate the data centre to other location then operation team should provide all the technical support only to transfer the hardware and software comprising set-up infrastructures, configurations and setting up the same process at new location.
Application configuration support	▪ Support in configuration management - alarm rules changes/user access rights if required. ▪ During the specified and agreed period for maintenance and support, there may be chances to add/replace the new metering nodes in existing substations to the system then ATS should also cover the addition of the new metering nodes and related activities to add in the complete process but hardware arrangement to add new meters need some raw material which shall require commercial consideration.
Project monitoring & SLA reports	▪ On monthly basis, ATS team should generate a summary report including list of activities conducted for the above sections during ATS support. ▪ In case project has some defined SLA for the ATS support then team shall maintain the SLA as well and adhere to SLA for service support. ▪ It should cover ▪ Monthly project status report ▪ Monthly ATS support report

	- Monthly field visit report - Monthly SLA status report
Meter reading	- Regular execution of the application modules, monitoring and report generation is also in ATS team scope. - Automatic application shall be deployed but in case of meter data missed for load survey (required parameters) then manual meter reading through CMIS/laptop/mobile app. of all meters at substations shall be done on weekly basis by 2nd day of every week to ensure the DSM reporting on weekly basis. Bidder's team can take help of the substation staff to get the timely meter reading for missed data.

8.28 Exclusions from scope of AMC/ATS:

1. Hardware-

- Major enhancement/ development more than defined limit or defined man days as per the signed contract. Any work involving efforts more than the agreed man days shall have financial impact (to be discussed and agreed internally).
- Technology migration / upgrade (to be driven by the signed contract and agreement).
- Third party installed hardware in the field (to be discussed and elaborated).
- Any civil work required unless and until specified.
- Hardware failures in the computer systems, any hardware damage due to force majeure conditions.
- Any new addition within the substation shall be covered in the existing ATS activity (work such as addition of new feeder, new meter replacement and related application activities) but any new addition of the substation or any new geographical area shall have financial implication. Malfunctioning of meters or site material arising due improper earthing of electrical systems by Utility (in case not installed & commissioned by bidder).
- To ensure the working of CT/PT etc. is in the scope of client.

2. Application software service -

- Any modification in software / development activity more than defined man efforts
- Customization / enhancements (new feature/new report/dashboard/new UI) having development need more than the defined limit in above clauses.
- Any new integration requirements other than the part of contract.
- New module/application development
- Implementation of new packaged application
- Technology migration / upgrades
- Multi language development and support. Any audit related and consulting activities for process improvements/IT-engineering.

3. Project Field Maintenance

- All activities under project services shall go through change management. For those activities under project services, ARC (Additional Resource Charge) would apply for the same. The pricing shall be mutually discussed and shall be agreed upon case to case basis before initiating the activity.
- Scope of this contract is limited to the equipment supplied against this contract only. Any new hardware / software supply & installation shall not be covered under this scope. For this, utility shall place purchase orders separately.
- The contract is limited against any defect arising due to design and manufacturing defects. Any defect arising due to operational fault or damage or natural calamity shall not be covered under this contract. This Contract does not cover any defect in the product caused by accident, misuse, neglect, alteration, modification or substitution of any of the components or parts, or any attempt at internal adjustment by unauthorized service personnel, external faults or usage other than specified. Any defects / breakages observed out of the warranty period shall be attended on chargeable basis and the same shall be decided on mutually agreed terms & conditions.

8.21 Dependencies

- The end user does not change /alter any hardware and software provided by bidder in the field at its own.
- The performance and availability of the data from field devices and meters heavily depends on maintaining the healthiness of the allied hardware and connections by the end user in the field.
- The field problem resolution response shall depend on the cooperation by and from.
- Dependency for Shutdown shall be on Utility.
- To provide base data like CT/PT ratio, transformer capacity, substation details etc. shall be provided by utility only.

9 Annexure 1 : Specification of Interface Energy Meter (IEM)

TECHNICAL SPECIFICATIONS FOR 0.2s ACCURACY CLASS AC STATIC TRANSFORMER OPERATED METERS, SUITABLE FOR INTER UTILITY MEASURING, BULK CONSUMER MEASURING, AND FLOWING MEASURING AND AVAILABILITY BASED TARIFF (ABT)/ DSM (Dedicated Settlement Mechanism) METERING

1.0 SCOPE

This specification covers the design, engineering, manufacture, assembly, inspection and testing before supply and delivery at site/ FOB destination of class 0.2s accuracy static HT tri-vector CT/ VT operated meters, along with other associated equipments as per details given in this specification. The meters shall be used for commercial/ tariff metering for inter utility power flows/ bulk consumers as well for Availability Based Tariff (ABT) application.

The meter shall be complied with IEC/IS specification. The meter records parameters under import and or export conditions.

One static type composite meter shall be installed for each circuit, as a self-contained device for measurement of power transmittals, as described herein, in each successive 15 minute block, and certain other functions, detailed in the following paragraphs. Meter shall have provision for in-site configuration of 5 min in future to comply with statutory requirements.

The metering system shall be housed in rack with draw-out type feature capability for inserting the meter module. Current terminal connection must be shorced when module is drawn out. The rack shall have facility to accommodate either one or two individual 0.2s accuracy class meter modules for supporting the single and multiple points of installation practices respectively.

The meter shall have wide secondary current range support i.e. same meter shall be put up for 1A or 5A rating as per field availability of CT's. The meter shall support 200% Ibasic. Meter required to be commissioned at each substation shall be of 3 phase 4 wire.

It is not the intent to specify completely herein all the details of the design and construction of material. The material shall, however, conform in all respects to the best industry standards of engineering, design and workmanship and shall be capable of performing for continuous commercial operation in a manner acceptable to the purchaser. The offered equipment shall be complete in all respects including all components/ accessories for effective and trouble free operation according to the specifications. Such components shall be deemed to be within the scope of this specification irrespective of whether these are specifically brought out or not.

2.0 APPLICABLE STANDARDS

2.1 STANDARDS

The equipment shall conform (for testing, performance and accuracy) in all respects the relevant Indian/ International metering standards with latest amendments thereof unless otherwise specified.

S. No.	Standard No.	Title
1.	IS 14497	AC static transformer operated Watt-hour and VAR-hour meters for class 0.2s and 0.5s
2.	CBIP technical report no. 304 (magnet immunity)	Specification for AC static electricity energy meters immunity against magnetic interference up to 0.2T/T

3.	IEC 62052-11	Electricity metering equipment (AC) – General requirements, tests and test conditions
4.	IEC 62053-22	Static meters for active energy (class 0.2 S and 0.5 s)
	IEC 62056	The standard for Electricity metering – Data exchange for meter reading, tariff and load control
5.	IS- 15099 DLM5 companion Standard (ICS)	AC static transformer operated Whathour and VArh hour meters for class 0.2s category B (ABT compliant) metering

2.2 Equipments matching with requirements of other national or international standard which ensure equal or better performance than the standards mentioned above shall also be considered. When the equipment offered by the bidder conforms to standards other than those specified above, salient points of difference between standards adopted and standards specified in this specification shall be clearly brought out in the relevant schedule and copy of such standards along with their English translation shall invariably be furnished along with the offer.

3.0 CLIMATIC CONDITIONS

The meters to be supplied against this specification shall be required to operate satisfactorily and continuously under the following tropical conditions of hot, humid, dusty, rust and fungus prone environment.

i)	Max. ambient air temperature (°C)	: 55
ii)	Min. ambient air temperature (°C)	: (-) 5
iii)	Average daily ambient air temp. (°C)	: 32
iv)	Max. Relative Humidity (%)	: 95
v)	Min. Relative Humidity (%)	: 18
vi)	Max. Altitude above mean sea level (m)	: 1000
vii)	Average Annual Rainfall (mm)	: 1200
viii)	Max. wind pressure (Kg/Sq.m)	: 195
ix)	Isocraonic level (days per year)	: 50
x)	Seismic level (Horizontal Acc. in g)	: 0.1

4.0 PRINCIPAL PARAMETERS

The energy metering rack with meters shall be indoor type connected with the secondary side of outdoor current and voltage transformers and mounted in suitable panel/ cubicles.

S. No.	Item	Specification
1.	Type of installation	Indoor panel/ cubicle mounted
2.	VT secondary	3x110V/√3 Phase to Neutral (3P4W) Variation -30% to +20%
3.	CT secondary	3 x +/-1 Amps or 3 x +/-5 Amps (configurable in field as per requirement)
4.	Dual Auxiliary AC/ DC Supply	44-240 V AC/DC ± 20%, 50/60 Hz or 24-48 V DC ± 20%

		Note: Any of the one or two auxiliary supply option shall be available.
5.	System frequency	50Hz $\pm$ 5%
6.	Earthing System	Solidly Grounded

The meter should be suitable for working with above supply variations without damage and without degradation of its metrological characteristics.

5.0 TECHNICAL REQUIREMENTS

5.1 DISPLAY

The meter shall have Graphical LCD with backlight for proper depicting of values in user friendly manner like values with unit, OHV codes, favourite page etc.

5.2 POWER FACTOR RANGE

The metering system shall be suitable for full power factor range from zero (lagging) through unity to zero (leading). The metering module shall work as an active energy import and export meter along with reactive (lag and lead) meter. The energy measurement should be true four quadrant type.

5.3 ACCURACY

Class of accuracy of the metering system shall be 0.2s for energy measurement. The accuracy should not drift with time.

5.4 POWER CONSUMPTION OF METER

- The meter must be capable to operate with the power drawn from the Auxiliary Power supply (AC/DC) instead of Station VT power supply.
- Voltage Circuit: The active and apparent power consumption in each voltage circuit including the power supply of metering module at reference voltage, reference temperature and reference frequency shall not exceed 1 Watt per phase and 1 VA per phase respectively.
- Current Circuit: The apparent power taken by each current circuit at basic current, reference frequency and reference temperature shall not exceed 1 VA per phase.

5.5 STARTING CURRENT

The metering module should start registering the energy at 0.1% of rated active power factor.

5.6 MAXIMUM CURRENT

The rated maximum current of the metering module shall be 200% of basic current (Ib).

5.7 The meter shall work accurately irrespective of phase sequence of the main supply.

5.8 GENERAL CONSTRUCTIONAL REQUIREMENTS

Meters shall be designed and constructed in such a way as to avoid causing any danger during use and under normal conditions. However the following should be ensured:

- Personal safety against electric shock
- Personal safety against effects of excessive temperature
- Protection against spread of fire
- Protection against penetration of solid objects, dust and water in normal working condition

All the materials and electronic power components used in the manufacture of the meters shall be of highest quality and reputed make to ensure higher reliability, longer life and sustained accuracy.

The meters shall be designed with application specific integrated circuits. The electronic components shall be mounted on the printed circuit board using latest Surface Mount Technology (SMT).

All insulating materials used in the construction of meters shall be non-hygroscopic, non-aging and of tested quality. All parts that are likely to develop corrosion shall be effectively protected against corrosion by providing suitable protective coating.

The metering system when mounted in panel shall conform to the degree of protection (IP) in the normal working condition of IS 12000/ IEC 629 for protection against ingress of dust and moisture.

5.9 MANUFACTURING ACTIVITIES

Meter should be manufactured using SMT (Surface Mount Technology) components and by deploying automatic SMT pick-and-place machine and reflow solder process; the bidder should own such facilities.

Quality should be ensured at the following stages:

- i) At PCB manufacturing stage, each board shall be subjected to computerized bare board testing.
- ii) At insertion stage all components should under go computerized testing for conforming to design parameters and orientations.
- iii) Complete assembled and soldered PCB should under go functional testing using Automatic Test Equipment.
- iv) Prior to final testing and calibrations, all meters shall be subjected to accelerated ageing test to eliminate initial mortality.
- v) The calibration of meters shall be done in house.

5.10 SEALING

Proper sealing arrangement shall be provided in metering system as follows:

- i) Two numbers sealing screws shall be provided on the front cover of metering module.
- ii) Provision shall be available to seal the back connections on the metering rack using the back plate.
- iii) Provision shall be available to seal output port.

The sealing arrangement should be suitable for applications of Polycarbonate resin.

5.11 MARKING OF METER

The basic marking on the metering module name plate shall be as follows:

- i) Manufacturer's name and trade mark
- ii) Serial Number
- iii) Year of manufacture
- iv) Type Designation
- v) Number of phases and wires
- vi) VT commissioning information
- vii) CT commissioning information
- viii) Reference frequency
- ix) Accuracy Class

Additionally, following information shall also be available on name plate:

- i) Property of "Purchaser name"
- ii) P.O. No. "Meter"

5.12 The connection diagram of the metering 3PW meter shall be depicted via suitable sticker pasted on meter. The meter terminals shall be properly marked to identify voltage, Current, Auxiliary and communication parts.

5.13 The meters shall be suitable for being connected directly through its terminals to VTs having a rated secondary line-to-line voltage of 110V, and to CTs having a rated secondary current of 1A or 5A. Any further transforming transformer required for their functioning shall be in-built in the meters. Necessary isolation and/or suppression shall also be built-in, for protecting the meters from surges and voltage spikes that occur in the VT and CT circuits of extra high voltage switchboards.

5.14 The active energy measurement shall be carried out on 3 phase, 4 wire principle with an accuracy as per class 0.2s of IEC 6067. The meters shall compute the active energy and load import; active energy and load export from the calculation has been during each successive 15 minute integration period block and store it in its non volatile memory.

5.15 The meter shall compute the average frequency during each successive 15 minute block and store in its memory.

5.16 The meter shall have Inputs/ Outputs pinning pins availability. This shall help in transferring the same Energy parameters being recorded inside the meters as pulse output as well for SCADA application at remote stations.

5.17 The meter shall compute the reactive power on 3-phase, 4-wire principle, with an accuracy as per relevant IEC standards, and integrate the reactive energy algebraically into two separate reactive energy registers, one for the period for which the average RMS voltage is greater than 100V (Reactive high) and the other for the period for which the average RMS voltage is below 100V (Reactive low). When lagging reactive power is being sent out from calculations has been, reactive registers shall move forward. When reactive power flow is in the reverse direction, reactive registers shall move backwards.

5.18 Further, the reactive energy shall also be available in four different registers as:-

- i) Reactive import while active import
- ii) Reactive import while active export
- iii) Reactive export while active import
- iv) Reactive export while active export

5.19 Active and Apparent energies shall also be made available by meter in separate energy registers as:-

- i) Active energy import
- ii) Active energy export
- iii) Apparent energy (while active import)
- iv) Apparent energy (while active export)

5.20 Meter shall have provision to compute apparent energy based on lag only or lag/lead. The same shall be configurable at factory end.

5.21 The meter shall be compatible with AIT tariff as well as TOD tariff.

5.22 For reactive power and reactive energy measurement, limits of errors all the four quadrants shall be in accordance to IEC 6067 / IEC 62053-21.

5.23 Each meter shall have a calibration LED (pinout) for checking the accuracy of active energy measurement. Further, it shall be possible to switch over the same test output device to reactive energy via suitable means provided in the metering system. This LED shall be visible from the front side.

The metering system shall normally operate with the power drawn through the auxiliary AC or DC supply. The metering system design should enable the auxiliary supply to be switched automatically between the AC and DC voltage, depending upon their availability. Typical auxiliary voltages available are 60-240 V AC, $\pm 20\%$, or 24-60 V DC $\pm 20\%$. The system shall continue to work even if one out of the above auxiliary supply (AC/ DC) is present.

5.24 Each metering module shall have a built in calendar and clock, having an accuracy of one (1) minute per month or better. The calendar and clock shall be correctly set at the manufacturer's works.

An automatic backup for continued operation of the meter's calendar-clock shall be provided through a long life battery, which shall be capable of supplying the required power for at least two years under meter un-powered conditions. The meters shall be supplied duly fitted with the batteries, which shall not require to be changed for at least ten years, as long as total supply interruption does not exceed two years.

5.25 TOD (Time of day registers). The meter shall have TOD registers for active energy import and export, apparent energy import and export and apparent MB import and export. Maximum eight time of day registers including universal (0-24 hrs) register can be defined. It shall be possible to program number of TOD registers and TOD timings through suitable high level software/ M2M as an authenticated transaction.

5.26 Maximum Demand (MD) Registration: The meter shall continuously monitor and calculate the average demand of configured parameter during the integration period set and the maximum out of these shall be stored along with date and time when it occurred in the meter memory. The maximum demand shall be computed on fixed block principle. The maximum registered value shall be made available as meter readings. The integration period shall be set as 15 minutes that shall be capable to change to other integration period (30/60 minutes), if required, through suitable high level software; MRL as an authenticated transaction.

5.27 Maximum Demand Reset: Following provisions shall be available for MD reset in meter –

- i) Auto-billing as predefined date and time
- ii) Manual via certain MD reset buttons (optional)
- iii) Authenticated transaction through suitable high level software / MRL (optional)

5.28 The display shall be of Graphical LCD type with colored backlit and soft push buttons. Individual display shall be provided for all the meters housed in a metering rack.

The display shall indicate direct values (i.e. without having to apply any multiplying factor) of measured / computed parameters as per the meter commissioning. It should be possible to easily identify the single or multiple displayed parameters through legends on the metering system display like ODS codes etc.

The register shall be able to record and display starting from zero, for a minimum of 1500 hours, the energy corresponding to rated maximum current at reference voltage and unity power factor. The register shall not roll over in between this duration.

5.29 Each of the metering module shall display on demand & in Auto scroll mode the following quantities/ parameters

- i) LCD segment check
- ii) Date
- iii) Time
- iv) Cumulative active energy import
- v) Cumulative active energy export
- vi) Cumulative net active (Import – Export) energy
- vii) Cumulative reactive energy lag while active import
- viii) Cumulative reactive energy lead while active import
- ix) Cumulative reactive energy lag while active export
- x) Cumulative reactive energy lead while active export
- xi) Cumulative apparent energy (while active import)
- xii) Cumulative apparent energy (while active export)
- xiii) Cumulative Reactive High energy
- xiv) Cumulative Reactive Low energy
- xv) Last 15 minutes block average of active import energy
- xvi) Last 15 minutes block average of active export energy
- xvii) Last 15 minutes block average of the net active (Import – Export) energy
- xviii) Last 15 minutes block average frequency
- xix) MD reset count
- xx) Maximum demand apparent (while active import) for current month (0-24 hrs)
- xxi) Maximum demand apparent (while active export) for current month (0-24 hrs)
- xxii) Cumulative active import energy reading of predefined date and time for monthly billing purpose
- xxiii) Cumulative active export energy reading of predefined date and time for monthly billing purpose
- xxiv) Cumulative net active (Import – Export) energy reading of predefined date and time for billing purpose
- xxv) Cumulative apparent energy (while active import) reading of predefined date and time for monthly billing purpose
- xxvi) Cumulative apparent energy (while active export) reading of predefined date and time for monthly billing purpose
- xxvii) Maximum demand for apparent (while active import) of predefined date and time for monthly billing purpose
- xxviii) Maximum demand for apparent (while active export) of predefined date and time for monthly billing purpose
- xxix) Present anomaly status
- xxx) Date of first occurrence of anomaly
- xxxi) Time of first occurrence of anomaly
- xxxii) Time of last restoration of anomaly
- xxxiii) Date of last restoration of anomaly

viiv) Total anomaly count

There should a facility to configure the display parameters in frontis page.

5.30 Load Survey: Each metering module shall have a non-volatile memory in which the following shall be automatically stored for each successive fifteen (15) minute block:

- i) Active input
- ii) Active export
- iii) Average frequency
- iv) Apparent whole active input
- v) Apparent whole active export
- vi) Reactive High energy
- vii) Reactive Low energy

15-minute coverage of the above parameters shall be available for last thirty five (35) days. It shall be possible to select either energy or demand view of these Computer Software (SCS) end. The load survey data should be available in the form of bar charts as well as in spreadsheets. The BCS shall have the facility to give complete time synchronized load survey data both in numeric and graphic form.

5.31 Billing parameters: The predefined date and time for registering the billing parameters of shall be 00.00 hours of the first day of each calendar (billing) month. Each meter shall store the following parameters corresponding to defined bill dates for up to last six (6) months:

- i) Active energy input
- ii) Active energy export
- iii) Apparent energy (whole active input)
- iv) Apparent energy (whole active export)
- v) Maximum demand Apparent (whole active input)
- vi) Maximum demand Apparent (whole active export)

5.32 Daily midnight parameters: The metering modules shall store following end day parameters for last thirty five (35) days:

- i) Active energy input
- ii) Active energy export
- iii) Reactive high energy
- iv) Reactive low energy

5.33 Data Communication Capability:

The metering system should have a suitable communication ports for local reading, remote and on-line communication facilities.

Each metering module shall have an optional galvanically isolated serial communication (in the form of 1,102 p.c.c) & USB port on its front for tapping all the data stored in its memory. For the purpose of local meter reading PC drive shall used. It shall be possible to download meter data via Optical port by connecting laptop computer directly. The overall intention is to have the local ports to copy the data stored in meter once in a week/month and transmit the same to PC with BCS services. Both optical and USB ports shall have sealing provision.

The metering system shall further provide a serial RS232, RS485 (In & Out) and Ethernet communication TCP/IP port for remote data transfer to a central location. This port shall be capable of data transfer to a remote computer over suitable communication media (GPRS/GSM/ leased line/ OPC) using suitable communication hardware (modems/ multiplexer/ communication cables etc.) as required for proper functioning of remote meter reading scheme. All port shall communicate simultaneously. TCP/IP shall have provision for configuring multiple open protocol like MODBUS and IEC61850 using two separate channel simultaneously.

5.34 Each meter shall have a unique identification code i.e. serial number, which shall be marked on name plate as well as in its memory. Further all meters of the same model shall be totally identical in all respects except for their unique identification codes.

5.35 The meters shall solely withstand the usual fluctuations arising during faults etc. In particular, 115% of rated VT secondary voltage applied continuously and 150% of rated voltage applied for 1.0 seconds, and 18 times of rated

CT secondary current applied for 85 seconds shall not cause any damage to or malfunctioning of the meters. Further the immunity of metering system to external magnetic field shall be as per latest IEC recommendations.

5.26 Meter shall have non-volatile memory in which the parameters as mentioned in this specification shall be stored. The non-volatile memory shall retain the data for a period not less than 10 years under no-powered condition. history back up memory shall not be treated as NVM.

5.27 Meter shall have the capability and facility to compensate for errors of external measurement transformers i.e. CT and VT.

- A. Linear compensation for measurement PT errors (ratio and phase), shall shall be linear adjustment which shall be applied across the complete measurement range of the transformer.
- B. Nonlinear compensation for measurement CT errors (ratio and phase) compensation. This shall allow multiple ratio and phase adjustments to be applied for different load points per phase input of the meter.

It should be possible to program the errors of CT and VT in meter through front optical communication port using compatible high level software. Metering system design should support this feature and further it shall be possible to configure & incorporate this feature in meter at later stage whenever required.

5.28 The metering modules shall be draw out type with automatic CT shorting feature so as to ease the testing/ replacement of meters without disturbing the system.

5.29 The meter display should depict the total harmonic distortion (THD) of current and voltages up to 31st order of power quantity for providing the feature of supply monitoring to Utility.

6.0 ANOMALY DETECTION FEATURES

6.1 The meter shall have features to detect and log the occurrence and restoration of following anomalies, along with date and time of event:

- a) Phase wise Missing Potential – The meter shall detect missing potential (1 or 2 phases) provided the line current is above a specified threshold. The voltage at that stage would be below a specified threshold.
- b) Phase wise Current Circuit Reversal – The meter shall detect reversal of polarity provided the current terminals are reversed. This shall be recorded for 1 or 2 phase CT reversal.
- c) Voltage Unbalance – The meter shall detect voltage unbalance if there is unbalance in voltages.
- d) Current Unbalance – The meter shall detect current unbalance if there is unbalance in load conditions. Meter should sense true system conditions before going for current unbalance checks.
- e) CT Miss – The meter shall detect current miss if the current is below a defined threshold, provided the phase voltage is above a specified threshold.

Snapshots of phase wise voltage, phase wise active current and phase wise power factor shall be provided with above specified anomaly events.

Further, each meter module shall record the following events along with total duration:

- a) Power On/Off – The meter shall detect power off if both the auxiliary supplies fail. The event shall be recorded on the next power up. At the same time power on event shall be recorded. No snapshot shall be logged with this event.
- b) Feeder Supply Fail – This event shall be logged when feeder supply, i.e. all the voltages goes below certain threshold. No snapshot shall be logged with this event.

6.2 Last ten hundred (1000) events (occurrence + restoration), in total, shall be stored in the meter memory on EEP or first out basis.

6.3 There shall be five separate compartments for logging of different type of anomalies:-

Compartment No.1	100 events of Missing Potential
Compartment No.2	100 events of CT Reversal
Compartment No.3	100 events for Feeder Failure / Power On/Off
Compartment No.4	50 events of Transaction related changes as per ICS Category B.

Once one or more compartments have become full, the last anomaly event pertaining to the same compartment shall be entered and the earliest (first one) anomaly event should disappear. Thus, in this manner each occurring anomaly event shall replace the earliest recorded event, compartment wise. Events of one compartment/ category should overwrite the events of their own compartment/ category only. In general persistence time of 5 min. for occurrence and restoration respectively need to be supported in meter.

6.4 Anomaly count should increase as per occurrence (not restoration) of anomaly events. Total no. of counts shall be provided as BCS.

7.0 TRANSACTIONS

The meter shall record critical events (as performed in authenticated manner) of Time out, MII reset operation and tariff change. These events shall be logged in roll over mode for up to twenty numbers.

8.0 SELF DIAGNOSTIC FEATURE

The meter shall be capable of performing complete self diagnostic check to monitor the circuits for any malfunctioning to ensure integrity of data in memory location all the time. The meter shall have indication for unsatisfactory/ malfunctioning/ malfunctioning of the following:

- i) Non volatile memory
- ii) RTC battery

The above malfunctioning should be flagged in the meter memory and should be made available in meter reading data.

9.0 TYPE TEST CERTIFICATE

The meters shall be fully type tested as per relevant standards IS 14007. The type test report of the meters shall be submitted by bidder along with the offer. Type test reports shall not be more than 2 years old.

QUANTIFIED TECHNICAL PARTICULARS

S. No.	Technical Specification/ Requirements	Bidder's Offer
1.	Manufacturer's name & Country	
2.	Type of Meter	
3.	Name and model no. of reference product	
4.	Standards to which meter complies	
5.	Accuracy class • Active energy measurement • Reactive energy measurement	
6.	Metering indicator provided on meter and switching facility for reactive & apparent energy	
7.	Variation of voltage at which system functions normally	
8.	Minimum Starting current	
9.	Maximum current	
10.	P.F. range	
11.	Power consumption per phase • Voltage Circuit • Current Circuit	
12.	AC and DC Auxiliary supply ratings for powering up the metering system	
13.	Sealing arrangement	
14.	Energy parameters recorded in meter	
15.	EMI compatibility	

16.	TDD compatibility	
17.	MDI Reset provisions • Auto • Manual	
18.	Demand integration period	
19.	Load survey parameters recorded in meter	
20.	Efficiency parameters recorded in meter	
21.	Daily Midnight parameters recorded in meter	
22.	Communication: Capability for • Local reading • On demand Remote reading	
23.	Facility of external CT/VT error compensation	
24.	Assembly detection features	
25.	Self diagnostics features	
26.	Magnetic immunity	
27.	Maximum no. of communication ports (e.g. Optical, USB, RS 232 etc)	

TECHNICAL SPECIFICATION OF ABT meter with Class A POWER QUALITY measurement features.

Technical specification for accuracy class "0.2S" AC static Tri-vector energy meter with class "A" power quality measurement

1.0 SCOPE

- 1.1 This specification covers the design, engineering, manufacture, assembly, inspection and testing before supply and delivery at site/ FOR destination of class 0.2S accuracy along with this Class A conforming to latest edition of IEC 62000-4-30 HT tri-vector CT/ VT operated meter. The meters shall be used for commercial/ tariff metering for inter utility power flows/ bulk consumers as well for Availability Based Tariff (ABT) application.

Meter shall be suitable for power quality measurements, monitoring and recording as per latest international standards which shall support high sampling rate of 1024 samples/cycle, extensive data logging capabilities, big intuitive display and high end communication capabilities. It shall have capabilities to capture, log and report PQ events, provide necessary data for analysis and assessment of power quality compliance to prevailing international standards.

- 1.2 The meter shall have wide secondary current range support i.e. same meter shall be put up for 1A or 5A rating as per field availability of CT's. The meter shall support 200% basic. The meter shall supply in 3-phase 4-wire mode. However, provision shall be there to configure the meter in 3-phase 3-wire type, as & when required, through authenticated/secured command.
- 1.3 The metering system shall be housed in rack with draw-out type feature capability for inserting the meter module. Current terminal connection must be automatically shorted when module is drawn out.
- 1.4 The meter shall be self-powered. The meter shall normally operate with the power drawn from the VT secondary circuits, without the need for any auxiliary power supply. However, there shall be provision of functioning of the meter with the help of auxiliary supply, both AC & DC. The power supply in self powered condition shall be from all the three phases of VT secondary, preferably equally, to ensure meter power supply when VT fuse(s) failures happen in one or two phases.
- 1.5 It is not the intent to specify completely herein all the details of the design and construction of material. The material shall, however, conform in all respects to the best industry standards of engineering, design and workmanship and shall be capable of performing for continuous commercial operation in a manner acceptable to the purchaser. The offered equipment shall be complete in all respects including all components/ accessories for effective and trouble free operation according to the specifications. Such components shall be deemed to be within the scope of this specification irrespective of whether these are specifically brought out or not.

2.0 APPLICABLE STANDARDS

2.1 STANDARDS

The equipment shall conform (for testing, performance and accuracy) in all respects the relevant industry international metering standards with latest amendments thereof unless otherwise specified.

IEC 62000-4-30 edition 3	Electromagnetic compatibility (EMC)-Testing and measurement techniques-Power quality measurement methods
IEC 62386-1	Product and performance requirements for PQ instruments
IEC 62386-2	Functional tests and uncertainty requirements

IEE 509-2014	Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
IS 50168	Expected limits for the power quality parameters in a public distribution network
IEC 61000-4-7	Measurement method and limits for harmonics and inter harmonics
IEC 61000-3-4	Limits for conducted disturbances for harmonics and inter harmonics
IEC 61000-3-6	Max. voltage on the supply voltage for mains signaling frequencies over 3kHz
IEC 61000-4-15	Flicker Measurement
IEC 62052-11	Electricity metering equipment (AC) – General requirements, tests and test conditions- Part 11: Metering equipment
IEC 62053-12	Electricity metering equipment (AC) – Particular requirement – Static meters for active energy (class 0.2S and 0.5S)
IEC 62053-24	Electricity metering equipment (AC) – Particular requirement Static meters for reactive energy (class 2 and 3)
IS 54087	AC static transformer operated Watt-hour and VAR-hour meters for class 0.2S
IS 25559	DLMS Indian Companion Standard – Category ‘B’ for Boundaries/Block/Ring/ART Metering

3.0 CLIMATIC CONDITIONS

The meters to be supplied against this specification shall be required to operate satisfactorily and continuously under the following tropical conditions of hot, humid, dusty, rust and fungus prone environment.

i) Max. ambient air temperature	+35 °C
ii) Min. ambient air temperature	+(-) 5 °C
iii) Average daily ambient air temp	+32 °C
iv) Max. Relative Humidity	+85 %
v) Max. Altitude above mean sea level	+2000 m
vi) Limit range of operating	+(-) 40°C to +70 °C
vii) Storage temperature range	+(-) 40°C to +70°C
viii) Operating temperature range	+(-) 20 to +60
ix) Display operating temperature range	+(-) 20 to +60

4.0 PRINCIPAL PARAMETERS

The energy meter shall be indoor type connected with the secondary side of outdoor current and voltage transformers and mounted in suitable panel/ cubicles.

S. No.	Item	Specification
1.	Type of installation	Rock Type, indoor/outdoor installation
2.	VT secondary	HV 3x110V/V ₀ V Phase to Neutral (3P4W) 3x110V V Phase to Neutral (3P1W) Variation: -20% to +20%
3.	CT secondary	8x 2A, 1max 2A

		10" Ib: 5A, max: 10A Size configurable
4.	Power Supply	Self Powered Auxiliary AC/DC Supply 80 to 250 V AC/DC, +/- 10%, 50/60 Hz
5.	System Frequency	50 Hz +/- 1%

The meter should be suitable for working with above supply variations without damage and without degradation of its metrological characteristics.

5.2 TECHNICAL REQUIREMENTS

5.2.1 POWER FACTOR RANGE

The metering system shall be suitable for full power factor range from zero (lagging) through unity to zero (leading). The meter shall work as an active energy import and export meter along with reactive (lag and lead) meter. The energy measurement should be true four quadrant type.

5.2.2 ACCURACY

Class of accuracy of the metering system shall be 0.2% for energy measurement along with conforming to Class A as per IEC 61000-4-30 and IEC62053-2 (Edition 5). The accuracy should not drift with time.

5.2.3 POWER CONSUMPTION OF METER

The meter must be capable to operate with the power drawn from the Auxiliary Power supply (AC/DC) instead of Station VT power supply.

5.2.4 STARTING CURRENT

The meter should start registering the energy at 0.1% Ib and unity power factor.

5.2.5 MAXIMUM CURRENT

The rated maximum current shall be 200% of basic current (Ib) as per the configuration.

5.2.6 The meter shall work accurately irrespective of phase sequence of the mains supply.

5.3 GENERAL CONSTRUCTIONAL REQUIREMENTS

Meters shall be designed and constructed in such a way so as to avoid causing any danger during use and under normal conditions. However the following should be observed:

- (i) Personnel safety against electric shock
- (ii) Personnel safety against effects of excessive temperature
- (iii) Protection against spread of fire
- (iv) Protection against penetration of solid objects, dust and water in normal working condition

All the materials and electronic power components used in the manufacturing of the meters shall be of highest quality and reputed make to ensure higher reliability, longer life and sustained accuracy.

All insulating materials used in the construction of meters shall be non-hygroscopic, non-aging and of tested quality. All parts that are likely to develop corrosion shall be effectively protected against corrosion by providing suitable protective coating.

The metering system when mounted in panel shall conform to the degree of protection IP54 in the normal working condition for protection against ingress of dust and moisture.

5.8 SEALING

Proper sealing arrangement shall be provided as follows:

- | | |
|------|---|
| i) | 2 nos. sealing arrangement at back side of the meter. |
| ii) | 2 nos. sealing arrangement between meter and rack at front. |
| iii) | 2 nos. sealing, back terminals of product with terminal cover |

The sealing arrangement should be suitable for application of Polycarbonate seals.

5.9 MARKING OF METER

The marking on every meter shall be in accordance with IEC. The basic marking on the meter name plate shall be as follows:

- | | |
|-------|------------------------------------|
| i) | Manufacturer's name and trade mark |
| ii) | Serial Number |
| iii) | Year of manufacture |
| iv) | Type Designation |
| v) | Number of phases and wires |
| vi) | VT commissioning information |
| vii) | CT commissioning information |
| viii) | Reference frequency |
| ix) | Accuracy Class |

Additionally, following information shall also be available on name plate.

- | | |
|-----|------------------------------|
| i) | Property Of "Purchaser name" |
| ii) | W.P.O. No. "Number" |

- 5.10** The connection diagram of the connecting 3P4W/3P3W meter shall be depicted on meter. The meter terminals shall be properly marked to identify voltage, Current, Auxiliary and communication ports.
- 5.11** The meters shall be suitable for being connected directly through its terminals to VT's having a rated secondary line- to- line voltage of 110 V, and to CT's having a rated secondary current of 5A or 5A. Any further transformers/ transducers required for their functioning shall be in-built in the meters. Necessary isolation and/or suppression shall also be built in, for protecting the meters from surges and voltage spikes that occur in the VT and CT circuits of extra high voltage substations.
- 5.12** The active energy measurement shall be carried out on 3 phase, 4 wire principle with an accuracy as per class 0.2% for active energy. The meters shall compute delta values of energies and store in the nonvolatile memory at each successive integration period block. The period should be configurable from 1 to 60 minutes. The instant parameter values shall be configurable to store in nonvolatile memory as well at each successive integration period block. It shall be configurable to select minimum/maximum/average/instant values to log for the instantaneous parameters.

5.23 The meter shall have inputs/ Outputs pulsing pins availability. This shall help in transferring the same Energy parameters being recorded inside the meters or pulse output as well for SCADA application at remote distance. A pulse pin will be fixed for output functionality and 4 pulse pins can be configured for input or output functionality. Potential free pulse output shall withstands 60V impulse.

5.24 The meter shall have Inputs/ Outputs pulsing pins availability. This shall help in transferring the same Energy parameters being recorded inside the meters or pulse output as well for SCADA application at remote distance. Pulse output shall be configurable for following power quality parameters and general parameters.

Power quality parameters at output	General parameters at output
High THD power	Energy pulse on channels
High harmonic voltage	End-of SIF, DAP Pulse
High harmonic current	End-of DAP pulse
Frequency healthy	Rate and MD register change
Phase wise Voltage THD (%)	Remote Control
Phase wise Current THD (%)	Average voltage healthy
Phase wise voltage healthy	All phase voltage healthy

5.8 POWER QUALITY AND ANOMALY DETECTION FEATURES

5.8.1 Power Quality Meter shall be Class A conforming to IEC 62000-4-30 edition 3

5.8.2 The meter shall have capability to detect and log power quality parameters as defined in IEC62000-4-30 as per the methods specified therein and as well complying with requirements of IEC 62586-2.

- Supply Frequency
- Magnitude of supply Voltage
- Magnitude of supply Current
- Flicker
- Voltage harmonics
- Current harmonics
- Voltage inter harmonics
- Current inter harmonics
- Over voltage deviation
- Under voltage deviation
- Voltage Unbalance
- Alarm signaling voltage

5.8.3 The meter shall have feature to detect and log the occurrence and reversion of power quality events as defined in IEC62000-4-30 along with date and time of event.

- Voltage Sag or Dip
- Voltage swell
- Interruption
- Rapid voltage change

5.8.4 The meter shall store following power quality parameters (10 minute aggregated values) data for analysis and meter shall store at least for 30 days.

- THD Voltage (phase wise)
- Flicker

- Supply Frequency
- Voltage unbalance (a2)
- Voltage harmonics L1 (2 to 25th)
- Voltage harmonics L2 (2 to 25th)
- Voltage harmonics L3 (2 to 25th)
- Current harmonics L1 (2 to 25th)
- Current harmonics L2 (2 to 25th)
- Current harmonics L3 (2 to 25th)
- (1) Flicker (Pst)
- (2) Flicker (Pst)
- (3) Flicker (Pst)

6.5 Waveform and RMS value capturing

For analysis, the meter shall have provision to log 33-cycle pre and post waveforms with RMS value for following events:

- Voltage Sag or Dip
- Voltage Swell
- Interruption

Software shall have provision of direction analysis of event as upstream and downstream

6.6 TDD and k-factor

The meter shall have provision for monitoring following:

- % TDD current phase wise
- k-factor
- Crest factor

6.7 Power quality compliance

Meter shall have capability to log all the parameter required to generate compliance report as per EN50150 & IEEE 519. Limits should be configurable using configuration tool and this stored data in the meter shall be used to generate compliance report.

Meter shall also support the data required to generate ITC curve using software.

6.8 Web server for remote display

Meter shall have built in web server to enable viewing of basic instantaneous parameters and cumulative energy registers data.

6.9 The meter shall have feature to detect and log the occurrence and restoration of anomalies along with date and time of event.

Following configurable events shall be provided in meter for which the persistence/restoration time can be configured through BCI:

- Over voltage
- Under voltage
- Current circuit open
- Current terminal shorting
- Reverse current direction (phase wise)
- Current missing (phase wise)
- Current unbalance
- Power fail
- Neutral Disturbance
- Magnet Interference
- Missing voltage (phase wise)

- Voltage unbalance
- Invalid Phase Association
- Invalid Voltage
- Feeder Supply Fail

Following quality parameter events shall be provided for which % occurrence/restoration time and time can be configured through BCS:

- Phase wise Voltage THD
- Phase wise Current THD

Last thousand (1000) events (occurrence + restoration), in total, shall be stored in the meter memory on first in first out basis.

6.30 DISPLAY PARAMETERS

Meter display shall be intuitive, easy to use and understood. The meter shall have minimum 4.3 inch graphical color display with High resolution.

Meter shall support following display parameters:

1. Voltage (Phase wise)
2. Current (Phase wise)
3. Power (Phase wise)
4. Vector diagram
5. Voltage wave form (Phase wise)
6. Current wave form (Phase wise)
7. Voltage-Current wave form (Phase wise)
8. Voltage %THD (Phase wise)
9. Current %THD (Phase wise)
10. Current %TDD (Phase wise)
11. Voltage harmonic for 2nd order (phase wise)
12. Voltage harmonic for 5th order (phase wise)
13. Voltage harmonic for 7th order (phase wise)
14. Current harmonic for 1st order (phase wise)
15. Current harmonic for 5th order (phase wise)
16. Current harmonic for 7th order (phase wise)
17. Instant voltage harmonic graphical trend up to 50th order (Phase wise)
18. Instant current harmonic graphical trend up to 50th order (Phase wise)
19. Flicker (phase wise)
20. Voltage crest factor (Phase wise)
21. Current crest factor (Phase wise)
22. Voltage deviation (Under & Over)
23. Voltage unbalance (% value)
24. Current unbalance (% value)
25. Main signaling voltage
26. Voltage sequence component
27. Current sequence component
28. Cumulative active energy import
29. Cumulative active energy export
30. Cumulative net active (Import - Export) energy
31. Cumulative reactive energy lag while active import
32. Cumulative reactive energy lead while active import
33. Cumulative reactive energy lag while active export
34. Cumulative reactive energy lead while active export
35. Cumulative apparent energy (while active import)
36. Cumulative apparent energy (while active export)
37. Cumulative reactive High energy

- 38. Cumulative Relative low energy
- 39. Last block average of active import energy
- 40. Last block average of active export energy
- 41. Last block average of the net active (Import – Export) energy
- 42. Last block average frequency
- 43. Maximum demand apparent (while active import) for current month (0-24 hrs)
- 44. Maximum demand apparent (while active import) for current month (0-24 hrs)
- 45. Cumulative active import energy reading of predefined date and time for monthly billing purpose
- 46. Cumulative active export energy
- 47. Cumulative net active (Import – Export)
- 48. Cumulative apparent energy (while active import)
- 49. Cumulative apparent energy (while active export)
- 50. Maximum demand for apparent (while active import)
- 51. Maximum demand for apparent (while active export)
- 52. Total event count
- 53. Present event status
- 54. Time of last restoration of event
- 55. Date of last restoration of event
- 56. Meter information
- 57. Configuration page for network setting

8.11 Active and Apparent energies shall also be made available by meter in separate energy registers as –

- i) Active energy Import total
- ii) Active energy Export total
- iii) Active energy Import fundamental
- iv) Active energy Export fundamental
- v) Active energy import total (phase wise)
- vi) Active energy export total (phase wise)
- vii) Net active energy
- viii) Apparent energy (while active import)
- ix) Apparent energy (while active export)

8.12 The reactive energy shall also be available in eight different registers as –

- i) Reactive import while active import
- ii) Reactive import while active export
- iii) Reactive export while active import
- iv) Reactive export while active export
- v) Reactive import
- vi) Reactive export
- vii) Reactive inductive
- viii) Reactive capacitive
- ix) Net reactive energy
- x) Net Reactive high and low
- xi) Reactive high import and export

8.13 Meter shall have provision to compute apparent energy based on lag only or lag-lead. The same shall be configured at factory end.

8.14 For reactive power and reactive energy measurement, limits of errors all the four quadrants shall be in accordance to IEC 62053-21 and IEC 62053-24.

8.15 The metering system shall normally operate with the power drawn through the auxiliary AC or DC supply. The metering system design should enable the auxiliary supply to be switched automatically between the AC and DC voltage, depending upon their availability.

6.16 Meter shall have a built-in calendar and clock, having an accuracy of ± 1 min/year or better. The calendar and clock shall be correctly set at the manufacturer's works.

6.17 TOD (Time of day registers): The meter shall have TOD registers for below energies and M3 values:

- i) Active energy Import total
- ii) Active energy Export total
- iii) Active energy Import fundamental
- iv) Active energy Export fundamental
- v) Apparent energy (wh) is active import
- vi) Apparent energy (wh) is active export
- vii) Reactive import while active import
- viii) Reactive import while active export
- ix) Reactive export while active import
- x) Reactive export while active export

Meter shall have support of eight configurable demand registers. It shall be possible to program number of TOD registers and TOD timings through suitable high level software/ MBI as an authenticated transaction.

6.18 Display sequences: Meter shall have color graphical display. The meter shall have all screens by default in manual sequences, user can configure auto-screens using manual button / software. Meter shall have provision to configure favor to page with the screens available in manual mode. The cycling delays shall be configurable. The configuration option shall be available in the meter with password protection.

The display shall indicate direct values (i.e. without having to apply any multiplying factor) of measured/ computed parameters as per the meter commissioning. It should be possible to easily identify the single or multiple displayed parameters through legends on the metering system display.

6.19 Data loggers (Load curves): Meter shall have a non-volatile memory with two individual loggers to store the delta energy values, instantaneous parameter and power quality data values for each successive configurable integration period block. The integration period shall be configurable for each logger. It can be configured for 5, 15, 30 or 60 Minutes.

Minimum 60 days with 5 minute interval shall have support in meter.

Following parameters shall have provision for logging:

- a) Energy parameters
- b) Voltage (Phase wise)
- c) Current (Phase wise)
- d) Phase voltage
- e) Line Voltage
- f) Frequency
- g) Power factor (Phase wise)
- h) Power factor (Phase wise)
- i) Phase angle (Phase wise)
- j) Voltage THD (Phase wise)
- k) Current THD (Phase wise)
- l) Power THD (Phase wise)
- m) Voltage harmonic up to 50th order (Phase wise)
- n) Current harmonic up to 50th order (Phase wise)
- o) Voltage inter-harmonic up to 50th order (Phase wise)
- p) Current inter-harmonic up to 50th order (Phase wise)

The instantaneous parameters can be configured for minimum/maximum/average or instant values for the configured integration period.

It shall be possible to select either energy or demand view of Data Computer Software (DCS)-end. The logger data shall be available in the form of bar charts as well as in spreadsheets. The RCI shall have the facility to give complete time synchronized load survey data both in numeric and graphic form.

- 8.20 Daily snapshot parameters:** The meter shall store the snapshot (or value) of configured parameters (out of 28 energy parameters) at configured time for last hundred (100) days. The RCI will provide facility to configure the parameters and time.

- 8.21 Data Communication Capability:** The metering system shall have following communication ports for local/remote reading. All the communication channels shall be capable of simultaneous and independent communication.

- IEC1107 optical port.
- RS232 port (for remote communication or dedicated to Modem)
- RS485 port (should be configurable on DMS/MODBUS)
- Ethernet port (DMS TCP/MODBUS TCP)
- USB (micro B connector) for meter reading or configuration through Laptop or PDA device.

- 8.22 Meter shall have provision for PQDI (Power Quality Data Interchange Format) for integration with any power quality analysis and reporting software. It shall have minimum provision of following power quality data:**

- FI events (Sag, swell and interruption)
- Voltages phase wise (10 min aggregation parameters)
- THD voltages phase wise (30 min aggregation parameters).
- Voltages unbalance (10 min aggregation parameters)

- 8.23 Meter shall have a unique identification code (i.e. serial number), which shall be marked on name plate as well as in its memory. Further all meters of the same model shall be totally identical in all respects except for their unique identification codes.**

- 8.24 Meter shall have a non-volatile memory in which the parameters as mentioned in this specification shall be stored. The non-volatile memory shall retain the data for a period not less than 10 years under Un-powered condition; battery backup memory shall not be treated as NVM.**

- 8.25 Meter shall have the capability and facility to compensate for errors of external measurement transformers (i.e. CT and VT).**

I. Linear compensation for measurement CT/VT errors (ratio and phase): there shall be linear adjustment which shall be applied across the complete measurement range of the transformer.

II. Non-linear compensation for measurement CT errors (ratio and phase) compensation: this shall allow multiple ratio and phase adjustments to be applied for different load points per phase input of the meter.

7.6 Software package

- 7.6.1 Software should be support with a powerful multi-user web-based over intranet software package to configure and setup the power quality meter. In addition, the software should provide tools for analysing the measured data. Generally, the following capabilities should be maintained by the software packages:**

- EN 50660 reports/Customised limits report
- IEEE 519-2014 report
- PQ report
- 60S PQ report

3.0 TEST CERTIFICATES

- Power quality compliance certificate as per IEC 61000-4-30 Ed. 3 (CISPR 25:05-2:Ann-A)
- Type test report (IS 14097)
- IEC/ISO compliance (IS 15650)

GUARANTEED TECHNICAL PARTICULARS

S.N	Technical Specification Requirements	
i.	Manufacturer's Name & Country	
ii.	Type of Meter	

3.	Name and model no. of offered product	
4.	Standards to which meter complies	
5.	Power quality Class	
6.	Accuracy class	
7.	Meterology indicator provided on meter and switching facility for reactive & apparent energy	
8.	Voltage and frequency range	
9.	Maximum current	
10.	Variation of voltage at which system functions normally	
11.	Minimum starting current	
12.	P.F. range	
13.	Power consumption per phase • Voltage Circuit • Current Circuit	
14.	AC and DC Auxiliary supply ratings for powering up the metering system	
15.	Sealing arrangement	
16.	Size (H x W x D) in mm Weight Mounting	
17.	Digital input/output	
18.	Communication ports i.e. Optical, USB, RS232, RS485 and Ethernet etc.	
19.	Communication protocol	
20.	IEC 61850	
21.	IEEE 1588.1 (PTC4H)	
22.	HTTP web server	
23.	EN 50160 – PQ report	
24.	Sampling rate	
25.	Data update rate	
26.	Time syncing options	
27.	Memory	
28.	Anti alias filter provision	
29.	Power quality parameters • Supply Frequency • Magnitude of supply Voltage & Current • Flicker • Voltage & Current harmonics • Voltage & Current inter harmonics • Over & Under voltage deviation • Voltage Unbalance • Short signaling voltage	
30.	Fixed power parameter logger	
31.	Power quality Events (with 30 cycle pre and post waveforms with RMS value)	

33.	PQD, S-factor and Crest factor	
33.	Power quality displays • <i>Power</i> • <i>Voltage crest factor</i> • <i>PQD</i> • <i>S factor</i> • <i>Crest factor</i> • <i>Current sequence component</i> • <i>Main signaling voltage</i> • <i>50 frequency</i> • <i>Voltage unbalance ratio</i> • <i>Current unbalance ratio</i> • <i>Voltage deviation</i> • <i>Voltage sequence component</i> • <i>Voltage harmonics</i> • <i>Current harmonics</i> • <i>PQD</i>	
34.	Trends (up to 50th order) on meter display	
35.	Individual Harmonics (both Voltage and Current) Up to 50th order	
36.	3.1 Two independent loggers Configurable for Interval 1, 5, 10, 15, 20, 30 or 60 Minutes.	
37.	Anomaly detection features	
38.	IEC 61850 compliance and category	
39.	Energy parameters recorded in meter	
40.	ABB compatibility	
41.	T00 compatibility	
42.	MD Reset procedure: Auto or Manual	
43.	Demand integration period	
44.	Energy parameters for Loggers, Billing and Midnight	
45.	Facility of external CT/VT error compensation	

10 Annexure B: Specification of DAS and DCU/Gateway

Specification of DCU/Gateway and Data acquisition system (DAS) module

Intent of DAS

The intent of DAS system is to automate the task of energy meter data collection from each meter/location from the Central Data Centre (CDC) followed by meter data validation, processing and generation of customized reports and integration with other modules. Collected data should be stored in database central data centre. DAS module should have following different capabilities to cater the requirements.

1. Communication with meters and DCU/gateway
2. Event notification and alarming
3. DCU/Gateway functional specification
4. DCU/Gateway hardware specification

Detailed working features of each function are described in the following sections:

1. Communication with meters and DCU/gateway

1. Data acquisition module should be capable to get the meter data directly from meters or via DCU/gateway for selected/configured metering location periodically on schedule basis.
2. All boundary meters at each substation having RS485 or TCP/IP port (preferred with TCP/IP port, if available in meter) should be connected to the LAN network to make the network and finally connected to the DAS system installed at CDC through DCU/gateway therefore software must be able to support all data reading from each type of feeder meters (via instantaneous energy, load survey, event etc.) with time stamping read using MODBUS/DLMS protocol at hourly reading frequency (user configurable to daily/weekly).
3. Gateway should have further facility to connect to the DAS server at CDC either through cellular GPRS/3G/4G communication media or via dedicated GPRS/ MPLS network.
4. DCU/Gateway should be responsible to collect the data from meters and sent same to DAS server at CDC. DCU should also be responsible to send the data to the local system installed at each substation for the purpose of local substation meter data monitoring.
5. DAS application after collection of data from DCU, should store the data into database like SQL/Oracle at CDC.
6. Communication of data transfer from DCU/Gateway to DAS server at CDC should be encrypted and secure.
7. DCU/gateway configurations and re-configurations should be managed from central data centre like reading frequency, reading schedule change etc. through web portal.
8. DAS should have the facility to fill the non read meter data via some auto fill mechanism so that 100% data of 15 mins. load profile parameters for billing purpose can be acquired. Missing data filling process via DLMS should be auto scheduling as per the availability of the network communication media.
9. DAS application should be web-based (browser) application to be accessed through internet and (and) from the network connected with the CDC server over intranet.
10. DAS system should implement highly efficient WAN data transfer protocol (as used by global IT companies) to CDC which reduces bandwidth requirements, hardware requirements and enhances reliability.
11. Software should be able to consider the configurations changes like CT/PT ratios, meter change etc. for accurate analysis reports.
12. Software should also have a backup mechanism for data backup and clearing, with retrieval mechanism for configurable number of days.
13. **Time synchronization:** DCU/gateway shall be able to auto sync regularly from the CDC server which will further connected to the reliable time reference like GPS clock and NTP server and then DCU/Gateway shall be able to auto sync the meter clock time (if the time difference lies between minimum and maximum threshold value of the time difference) on a predefined frequency.

2. Event notification and alarming

14. DAS system should have the provision to send the notification of any identified events like:
 - a. High/low limit violation of instantaneous parameters
 - b. Limit violation alarms for virtual groups/alar
 - c. Events logged by the meter
 - d. Communication failure

15. At the time of any event occurrence, it should generate a visual alarm on the screen of monitoring software at data centre. Notification may include email and recipients should be pre-configurable according to the utility to one/multiple users.
16. Software should be able to maintain all generated alarm history which can be seen by user based on the selection criteria.

3. DCU/gateway functional specification

17. DCU firmware shall be developed on Linux platform and compatible to Linux kernel 4.4 series.
18. DCU/Gateway should be capable to acquire meter data from different protocols i.e. MODBUS, DLMS over different communication ports i.e. RS485 and ethernet.
19. DCU/Gateway should be capable to acquire all type of meter data like: instantaneous parameter at the time of collection, energy data, load survey profiles, event data, midnight energy data and Date & time of collection of data.
20. DCU/Gateway should be capable to transfer the complete meter data to central data centre using BPLS/OPC/Modbus and 3G/3G+/4G communication media.
21. DCU/Gateway should support multi-banking capabilities on ethernet port as well as simultaneous acquisition on each serial port.
22. DCU/Gateway should be capable to have dual SIM option for redundancy and auto switching from one SIM to another SIM shall be available.
23. DCU/Gateway should have non-volatile memory for storing meter data for 30 days for FIFO buffer mode.
24. DCU/Gateway shall be able to communicate to the local server for substation local monitoring as well to the DMS server at CDC. DCU shall have the capability to transfer the meter data from local substation to CDC as per defined schedule and automatic retries for unsuccessful file transfer event.
25. DCU/Gateway should have
 - a. Number of meter connected per TCP/IP port over multiple channel at 9600 baud rate –
 - 30 (min) in case of 5min polling for 5 parameters
 - 50 (min) in case of 15min polling and >10 parameters.
26. The DCU/gateway shall support an optional meter reading function also. On demand meter reading can be executed either locally through local application or remotely through CDC and application whenever required. On demand reading can be executed for meter reading from any meter connected to the DCU/gateway irrespective of meter protocol and communication port.
27. DCU/Gateway data transfer: The DCU/gateway should be able to communicate through the 3G/4G communication, specifications defined below:
 - a. Supported GSM/GPRS/EDGE: Quad Band 850/900/1800/1900 MHz
 - b. SIM lock function – Yes
28. Remote configuration: DCU/gateway should have the facility to upgrade the firmware version over GPRS communication network using proper authentication through M2M (download over the air) process. It should also be possible to configure DCU/gateway in single or batch mode.

4. DCU/gateway hardware specification

DCU/gateway package should have two separate module i.e. power supply module and Gateway/DCU module.

Power supply for DCU/Gateway	
Input Voltage Range	Input: 200- 275 V AC (± 10%), 0.2A max 110- 240 V AC (± 10%), 0.2A max Output: 5.2V @ 1A (Input: 40V DC to 5V DC output compatible)
Grounding	Wall / DIN
Ingress protection	IP 54
Certification	EMC: Draft EN 281-409-1, Draft EN 281-409-2, Draft EN 281-409-3, EN 55032 Class B, EN 61000-3-2, EN 61000-3-3 Immunity: Draft EN 281-409-1, Draft EN 281-409-2, Draft EN 281-409-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5

		EV 61806-4-6, EV 61806-4-17 Safety: EN 62368-1:2014 (Second edition)
Gateway (TCU)		
Mechanical	Mounting	Wall / DIN
	Ingress Protection	IP 54
	Power connection	Input: 5-27 W, 1 A max. over Modular DC jack
Communication	Enclosure material	PC-PI (flame-retardant flame-retardant grade)
	Wireless	1 x 4G/LTE, 10/100 Mbps, / nat'l isolation from AC mains, 80/14/10%
	RS-485	2 x RS-485 half duplex / 48V isolation from AC mains
General features	4G / 3G / 2G	Dual Nano SIM - with auto SIM switching, 4G fallback to 3G / 2G / Operating voltage 1.6V to 3.3V DC
	Processor	Cortex-A735/ETHC, Dual Band (210/200/1800/1500 MHz)
	Storage	512 MB, Single user ARM Cortex-A7
	User Interface	2 x Push buttons
	LED	2 x Bi-Color LED (for device health and network health)
Environmental	RTC	Internal digital temperature compensated Real Time clock (Battery back)
	Operating Temperature range	-18 to 55°C
	Extended Temperature range	-28 to 75°C
	Storage Temperature	-28 to 80°C
	Relative Humidity	95%, non-condensing
Operating system	Vibration	up to 2g
	Linux	Linux OS
	Protection features	Temperature protection: Over two trip points, Trip1 @ 55 Deg. And Trip2 @ 75 Deg. / Inbuilt Watch dog timer
Certification		EMC: Draft-EN 301-489-1, Draft EN 301-489-17, Draft-EN 301-489-32 EN 55032 (Class B), EN 50368-2-2, EN 50368-2-3 Immunity: Draft-EN 301-489-1, Draft-EN 301-489-17, Draft-EN 301-489-32 EN 61806-4-2, EN 61806-4-3, EN 61806-4-4, EN 61806-4-5 EN 61806-4-6, EN 61806-4-17 Radiated Spurious emission: C73 EN 301-909-2, 3GPP TS 31-813-1
	Safety	Safety: EN 62368-1:2014 (Second edition)
	Accessories	2 nos. Whip Antenna

18.3 [Suitable for internal wiring to accommodate eight or more sets of metering equipment]

"SIMPLIST" metering panel having size approximately 2200 mm(height), 1000 mm(depth), 800 mm(width) fabricated from 2 (two) mm thick steel sheet (SS304) totally enclosed, dust tight, weather proof and vermin proof, floor-mounted steel structural frame, . Helical type outside provided with an access door or two hatches at the back side with latch and locking arrangements.

The bottom of the panel frame shall be about 100 mm high (to space all around), shall be erected by means of evenly spaced gusset bolts projecting through base channel (MC) members of the frame, the panel shall be provided with suitable cable entry arrangement through barrier plates. Panel inside shall be powder coated with same colour inside as well as outside off light grey shade-601 of IS 5 or equivalent international standards.

Panel wiring shall be standard switch board type, single core (stranded, minimum 7 conductor) annealed copper wires, PVC insulated suitable for tropical climates specified below, PLS type 1100 V grade. Wiring of CT circuit/ PT circuit shall be with 1.5 mm² respectively with standard terminal and ring type lugs/ Rost Country.

Panel shall be provided with common earthing rail that shall be connected with flexible GI strips with Substation earthing. Ground bus of galvanised iron bar not less than 5 mm by 25 mm shall be provided along the back of panels, the ground buses shall be bolted to the frame of the panel in such a way as to make good electrical contact with the panel. Hinged doors and all equipment on the metering cubicle shall be connected to the frame with braided copper strips.

Panel shall be completely enclosed and shall be dust, moisture and vermin proof to meet the requirements of IS 54. The panels shall be free standing, floor mounting type and shall be of rigid structural frames, enclosed completely, made with specially selected, smooth finished, LBSA sheet of thickness not less than 2.0 mm for front, sides, top & bottom portions and the doors. There shall be sufficient reinforcement to ensure level surfaces, resistance to vibrations and rigidity during transportation, installation and operation.

All doors and removable covers shall be gasketed all around with neoprene gaskets. Ventilation covers shall have screens and filters. Design, material selection and workmanship shall be such as to result in neat appearance both inside and outside, with no weld, rivets or bolt heads apparent from outside and with all exterior surfaces true and smooth.

All the Metering panels shall be suitable for accommodating eight sets of self contained metering sets with wiring provisions of current, potential and Aux. AC/DC circuits and communication accessories.

	Each metering panel shall contain the following items and accessories. METERING EQUIPMENT PANEL: Requirement as per price schedule	
S.No	Description of materials in short	Quantity
1.	Microprocessor based CT/PT operated, self contained (rack mounted meter module, calculating unit & display controller unit along with front & rear ports all complete as considered to be one set) 3 phase-3 wire/4 wire 1A/5A also selectable / programmable suitable for unbalanced load, HT Energy meters, class 0.2% IEC associated test terminal blocks installed in the front side and mounting of the meters and TTB shall be panel back type to comply with Indian Commission Standard (ICS) of Category B for IEC specification as detailed in this section and other section of tender documents.	As per requirement.
2.	Terminal Blocks, CATD M4 (disconnecting type) or equivalent for CT/PT circuit.	As per requirement plus 10% spare
3.	Terminal Blocks stud type CATM6 or equivalent for other circuits except CT/PT.	As per requirement plus 10% spare
4.	Potential supply complete fuse assembly, 4 nos (3 fuses + 1 link) for each meter. IBC 2A rating.	24 nos.
5. Complete fuse assembly :		
I.	(i) Panel LTAC (incoming single phase 240 V, 50 Hz supply complete fuse assembly, 2 nos (3 fuses + 1 link), IBC 16A rating.	02 (two) nos.
II.	(ii) Panel Space Division supply single phase 240 V, 50 Hz supply complete fuse assembly, 2 nos (3 fuses + 1 link), IBC 2A rating.	02 (two) nos.
III.	Panel Illumination single phase 240 V, 50 Hz supply complete fuse assembly, 2 nos (3 fuses + 1 link), IBC 2A rating.	02 (two) nos.
IV.	Panel socket single phase 240 V, 50 Hz supply complete fuse assembly, 2 nos (3 fuses + 1 link), IBC 6A rating.	02 (two) nos.
V.	Panel Incoming DC fuses & outgoing DC fuses.	14 (fourteen) nos.

4.	Panel space Heater: 240V, 50 Hz, 100 W, from any reputed make.	01 no.
5.	Thermistor (30 – 110 °C), from any reputed origin.	01 no.
6.	Photo type switches, 240 V, 50 Hz, 6A.	03 nos.
7.	Power supply socket (3 pin type), 240 V, 50 Hz, 6A.	01 nos.
10	Panel fluorescent / LED type illumination fittings, 240 V, 50 Hz, 30 W.	01 set.
11.	Door latch switch, 240 V, 50 Hz, from make.	01 no.
12.	PBLS, PVC insulated, annealed Cu flexible panel wires, minimum Potentials (2.5 mm ² for LT and 2.5 mm ² for HT or previous circuit) as per requirement.	50nos/ lot
13.	Lugs, Rail-Gouging, nuts, bolts, washers, spring washers, channel, rail, and PVC type perforated cable dressing mechanisms, etc. as per requirement.	50nos/ lot
14.	Panel Earthing Rail and flexible GI strips for isolation earthing connection.	50nos/ set.

Annexure IV : Specification for LT (FRLS) Cables

1. SCOPE

1.1 This specification covers Design, Engineering, Manufacture, Type Testing and Testing including special testing at the manufacturer's works and Delivery at sites as per General Technical Specification as per following:-

1.2. LT CONTROL CABLE (FRLS TYPE) - CL CONDUCTOR:

1.2.1 85 (C) stranded plain (untemed) annealed high conductivity copper conductor, Type A PVC insulated, extruded type ST-1, PVC inner sheathed single layer (L round) flat stranded, overall served with Type ST-1 PVC suitable compounded to ensure specified fire retardant low smoke properties, heavy duty control cable as IS: 1554 (Pt. I) (latest) and also meeting type and special test requirements as detailed herein.

10.1.1. NOTE:

1. Conductors shall conform to flexibility class 2, of IS: 8130.
2. PVC type shall conform to IS: 5831.

2. TECHNICAL QUALIFYING REQUIREMENTS FOR BIDDERS

2.1. As per MTF

3. MATERIALS REQUIRED

3.1. As per Price Schedule

4. TECHNICAL REQUIREMENTS

4.1. General :

- 4.1.1. The cables shall be suitable for laying in racks, ducts, trenches, conduits and underground buried installation and uncontrolled back fill and chances of flooding by water.
- 4.1.2. They shall be designed to withstand all mechanical, electrical and thermal stress under steady state and transient operating conditions.
- 4.1.3. The XLPE insulated cables shall be capable of withstanding a conductor temperature of 250°C during a short circuit without any damage. The PVC insulated cables shall be capable of withstanding a conductor temperature of 180°C during short circuit.
- 4.1.4. The Copper wires used for manufacturing the cables shall be true circular in shape before stranding and shall be uniformly good quality, free from defects.
- 4.1.5. The Ethen and inner sheath shall be of nonhygroscopic, fire retardant material, shall be better than insulation and outer sheath shall be suitable for the operating temperature of the cable.
- 4.1.6. Progressive sequential marking of the length of cable in meters at every one meter shall be provided on the outer sheath of all cables.
- 4.1.7. All the cables shall pass fire resistance test as per IS: 1554 (Part-I).

4.1.8 The normal current rating of all PVC insulated cables shall be as per IS 3963.

4.2. PVC Control Cables

- 4.2.1 The PVC (70°C) insulated control cables shall be of PHE type, E1 category, conforming to IS 1554 (Part-I) and its amendments, read along with this specification. The conductor shall be stranded copper. The insulation shall be extruded PVC type-A of IS 5831. A distinct inner sheath shall be provided in all cables whether armoured or not. The outer sheath shall be extruded PVC type-IT-1 of IS 5831.
- 4.2.2 Cables shall be identified as per IS 1554 (Part-I) for the cables up to four (4) cores as per clause 10.1 and IS 1554 (Part-I) and for cables with more than four (4) cores the identification of cores shall be done as per clause 10.1 or 10.2 of IS 1554 (Part-I) [to be decided during drawing approval stage].

5. STANDARDS

- 5.1 Cables specified in this specification shall conform to the standards mentioned against each and/or as applicable Indian Standards or equivalent with materials or components like conductor, insulation, sheathing, armoring etc. conforming to relevant IS/International /established Foreign Standards/practices. For cables covered under this specification the following standards/practices latest issues/versions or other standards/practices separately mentioned, will apply:-

I.	IS 1985	Electro-technical Vocabulary part 300 Cables, Conductors and accessories for electricity supply.
II.	IS 2461	Recommended current ratings for cables.
III.	IS 1554 (Pt. I)	PVC insulated (heavy duty) electric cables for working voltages upto and including 1.1kV.
IV.	IS 4968 (Pt. I)	Elastomer insulated cables for working voltage up to and including 1.1kV.
V.	IS 5831	PVC insulation and sheath of electric cables.
VI.	IS 8138	Conductors for insulated electric cables and flexible cords.
VII.	IS 6100	Elastomeric insulation & sheath of electric cables.
VIII.	IS 1975	Mild steel wires, strips and tapes for armoring of cables.
IX.	ASTM-D696	Standard test method for density of solids from the burning or decomposition of plastics.
X.	ASTM-D2843	Method of measuring minimum oxygen concentration in support like combustion of plastics.
XI.	IEC 303	Standard for type test of electric cables.
XII.	IEC 332 (Pt. II)	Tests on electric cables under fire conditions.
XIII.	IEC 331	Fire resisting characteristics of electric cables.

III.	IEC 754	Test on gases evolved during Combustion of electric cables.
IV.	SS 424 1475 (SINGAPORE STANDARDS)	Flammability test for cables.
V.	IE-894 (1990)	PVC insulated cables for working voltages up to and including 100 V
VI.	IEC 60813	Common test methods for insulating and sheathing materials of electric cables and optical cables
VII.	IEC 60332	Tests on electric and optical fiber cables under fire conditions (all relevant parts)
VIII.	IEC 60333	Tests for electric cables under fire conditions (all relevant parts)
IX.	IEC 60734	Test on gases evolved during combustion of materials from cables.
		Part 1: Determination of the amount of halogen acid gas.
		Part 2: Determination of degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity.
X.	IS-10418	Weldless crimps for electric cables

5.2. Notwithstanding the publication year, if mentioned here, the latest issues including the new ones superseding those mentioned in this specification if any, shall apply.

6. OPERATING CONDITIONS

- 6.1. Control Cables shall be used for CT secondary circuit, PT secondary circuit and for 220V/230V DC Control & Indication circuit.
- 6.2. Voltage variation shall be $\pm 1-20\%$.
- 6.3. Frequency variation shall be $\pm 5\%$.
- 6.4. For purpose of this specification ambient temperature shall be 55 deg C peak and 40 deg C average.
- 6.5. The cables will be laid in air in concrete/brick trenches or racks, shelves, risers, trays, etc. made from MS channels, angles, flats, MS rods etc. Cables may be laid in ducts and bored direct in the ground also.

TECHNICAL SPECIFICATION FOR LT CONTROL CABLES (FRLS TYPE)

1.	Designation :-	1100 V (5) grade, multi-core copper conductor, flat/round (armoured, overall) PVC insulated GI covered with PVC suitably compounded to ensure specified fire retardant low smoke properties heavy duty control cable.
2.	Reference :-	IS 10418 (Pt. 1), IS 8036, IS 5833, IS 1975, other applicable Standard & test requirements as subsequently specified.
3.	Conductor :-	Standard plain (untempered) annealed high conductivity copper conductor Class 2 table 2 of

		IS 1554
4.	Insulation : -	PVC Type A to IS 5011.
5.	Inner sheath & filler : -	PVC Type 37-1 to IS 5811. Inner sheath shall be extruded.
6.	Armouring : -	GI Wires/cables to IS 3975 and IS 1554 (Pt. I).
7.	Outer sheath : -	PVC Type 37-1 to IS 5811 suitably compounded for FRLS properties and with suitable additives to prevent attack by rodents and passing test requirements specified hereinafter.
8.	Factory test : -	As specified hereinafter.
9.	Colour code (4 core) : - Colour code (three 3 core) : -	Red-yellow-blue-black As per IS 1554 (Pt. I)

7. IDENTIFICATION

7.1. Throughout the length cables covered with FRLS PVC outer sheath shall be identified by surface marking by embossing/machine printing giving

- 7.1.1. Name of manufacturing and year of manufacture;
- 7.1.2. Cable description e.g. 1108 V 4C x 10.8 Sq. mm Cu PVC FRLS Type cable etc.
- 7.1.3. Name of customer e.g. CUSTOMER, BSEPC.
- 7.1.4. Embossed length measure in Meters at every meter interval.
- 7.1.5. Core identification shall be done as per clause 10.1 & 10.3 of IS 1554 (Pt. I)

8. DRUMMING, REELING AND MARKING :

8.1. Cables shall be supplied in non-returnable wooden or steel drums of heavy construction. Wooden drum shall be properly seasoned wood and free from defects. Wooden preservatives shall be applied to the entire drum.

8.2. Standard lengths of each size of cables shall be 3000± 3% reel lengths for power cables and 1000M ±5% for control cables unless otherwise specified. The cable length per drum shall be subject to tolerance of plus or minus 5 % of the standard drum length. Non standard lengths are not acceptable.

8.2.1 A layer of water proof paper shall be applied to the surface of the drums and over the outer most cable layer.

8.2.2 A clear space of at least 40 mm shall be left between the cables and the lagging. Each drum shall carry the manufacturer's name, the purchaser's name, address

and contract number and type, size and length of the cable, net and gross weight described on both side of the drum. A tag containing the same information shall be attached in the leading end of the cable. At surface and outside accompanying marking shall be marked on one end of the reel indicating the direction in which it should be reeled.

8.2.3 Packing shall be sturdy and adequate to protect the cables, from any injury due to mishandling or other conditions encountered during transportation, handling and

storage. Both cable ends shall be sealed with PVC/Rubber caps as or to eliminate ingress of water during transportation and erection.

9. TESTS

9.1. Following type tests including special tests, acceptance and routine tests as per requirements of relevant standards mentioned shall be carried out on conductors, wires and finished cables at the premises of NABL accredited Laboratory and/or at the premises of the manufacturer.

9.2. TYPE AND SPECIAL TESTS FOR FPLS CABLES-

TYPE TESTS:

A) Test as Conductor

1.	Tensile test (for Aluminium)	As per IS 8138.
2.	Annealing test (for Copper)	As per IS 8138.
3.	Wrapping test (for Aluminium)	As per IS 8138.
4.	Conductor resistance test (for Aluminium and Copper))	As per IS 8138.
B)	Test for armoring wires	As per IS 3473.
C)	Test for thickness of insulation and sheath	As per IS 5831 Appendix A of IEC 582
D)	Physical test for insulation and water sheath	As per IS 5831
	a) Tensile strength and elongation at break	
	b) Aging in air oven	
	c) Shrinkage Test	
	d) Hot deformation	
	e) Loss of mass in air oven	
	f) Heat Shock test	
	g) Thermal Stability	
	h) Cold Bend Test (for diameter <= 12.5 mm)	
	i) Cold Impact Test (for diameter > 12.5 mm)	
E)	Insulation resistance test	As per IS 1554 (Pt. II)
G)	High voltage test (water immersion test)	As per IS 1554 (Pt.I)
G)	High voltage test at room temperature	As per IS 1554 (Pt.I)
H)	Flammability Test	As per IS 1554 (Pt.I)
I)	Tests for bleeding and blooming of pigments	As per IS 1833
J)	Pile resistance Test	As per relevant IS

9.3. SPECIAL TESTS:

9.3.1. Oxygen Index test as per ASTM-D2683.

9.3.2. Temperature Index test as per ASTM-D2683.

9.3.3. Acid gas generation test as per IEC-754-1.

9.3.4. Smoke density test as per ASTM-D2643-77.

9.3.5. Flammability test via chimney test class F1 as Swedish standard SI 424-1475 and Bunched Cable Tray test as per IEC 365 shall be carried out and

tests shall conform to the requirements of the respective standards specified.

9.4. ACCEPTANCE TESTS FOR PLS CABLES (shall be conducted as per standard)

a)	Tensile test (for Aluminium)	1	IS 8138
b)	Annealing test (for copper)	1	IS 8138
c)	Wrapping test (for aluminium)	1	IS 8138
d)	Conductor resistance test	1	IS 8138
e)	Test for disbondment of insulation and shields		IS 8131 (all sizes)
			Appendix A of IS: 8131
f)	Insulation resistance test	1	IS 8131
g)	High voltage test	1	IS 1554 (Pt. I)
h)	Dimensional check	1	

9.5. ROUTING TESTS FOR PLS CABLES (shall be conducted on each drum of cable)

9.5.1. Conductor resistance test : IS 8138

9.5.2. High voltage test: IS 1554 (Pt. I)

9.6. Evidence of facilities for carrying out all the above tests in manufacturer's works shall be specifically confirmed. Dates of installation and commissioning and details of make, year of manufacture etc. for machines/test apparatus for carrying out 'special tests' shall be furnished.

9.7. Cost of all test pieces and tests shall be to the bidder's account.

9.8. The purchaser at his discretion may call for additional tests not included here, as may be required to ensure that all materials are satisfactory and in accordance with the specifications. All tests shall be carried out by the manufacturer expeditiously free of cost.

9.9. Routine TCs for all drums shall be furnished.

9.10. All TCs shall be submitted to the purchaser for approval before despatch.

9.11. All TCs shall be furnished in quadruplicate, the first three copies having original signature of the appropriate testing authority with designation and also name in block letter while the fourth copy may be facsimile.

9.12. The "LOT" size shall be decided by the purchaser representative at the time of inspection and testing at the manufacturer works based on QAP of the bidder.

9.13. Under armour and overall diameters of cables (average values) shall be recorded on each Routine test certificate.

9.14. DRAWINGS AND DOCUMENTS

As part of the offer, the tenderer shall furnish relevant descriptive and illustrative literature on cable and also the drawings and technical data for the following (enclosed below):

9.14.1. Descriptive literature/manufacturer's bulletins giving construction details cross section dimensions and characteristics of different type of cables offered.

9.14.2. Current rating of cable including derating factors due to grouping, ambient temperature and type of various installations.

- 9.14.1. Table for short circuit withstand capacity of cable and armour material indicating time duration.
- 9.14.2. Wiring up, sketches, colour details illustrating manufacturer's recommendations for cabling jointing and termination.
- 9.14.3. Table of voltage drop per ampere meter duty considering impedance at 90 Hz at maximum conductor operating temperature.
- 9.14.4. Tables giving mechanical constructional details including weight, diameter etc.

Annexure V: Specifications for Server and Client Computers

1. Client Computers (PC)

S. No.	Particulars	Specifications
1	Make	IBM/ DELL/HP
2	Processor	Intel i7, 3.4 GHz, 8th Core (8th Gen)
3	Memory type & size	16 GB RAM
4	Hard Disk Capacity (In TBs)	500 GB
5	Display Screen size & type	23" or higher wide range TFT/LCD, Flat Monitor
6	No. of USB Port	Min 4 USB
7	Other ports/connections provided	(i) 2 RJ45 LAN ports for receiving signal from Ethernet Switch (ii) One additional LAN port for receiving time synchronization signal from GPS receivers.
8	Operating system offered	WINDOWS 10/11
9	Warranty	3 Years

2. Server

S. No.	Particulars	Specifications
1	Processor	Intel Xeon 3.0 GHz or higher, 10th Gen
2	Memory type & size	16 GB RAM
3	Hard Disk Capacity (In TBs)	2 X 500 GB (3.5 inch)
4	Network Interface Card	10 Gbps
5	Server Vendor	HP/IBM/ Dell/ Lenovo/ etc
6	Warranty	3 Years

Annexure-II



Bihar Grid Company Limited **(BGCL)**

Detailed Project Report (DPR)

Name of the Work –

- “1. Construction of Security Barrack-cum-Field Hostel for fitters and trussless store buildings for GIS spares at Naubatpur and Jakkanpur GIS substations
2. Construction of trussless store building for GIS spares at Dumraon GIS Substation
3. Construction of the Headquarters Building of BGCL at Bhusaula Substation”

Ref: JMT/2023/Comp/00000000000000000000

Date: 04.07.2023

Extracts of the Minutes of the 44th meeting of the Board of Directors of Bihar Grid Company Limited held on Friday, 09th June, 2023 at 12.00 p.m. at BGP(HQ), Vidyal Bhawan, Boring Road, Patna-800001, through Video-Conferencing.

44.13. To review the progress of Phase IV Project Works of the Company.

- 44.13.1 The Board was apprised that the following value addition works were being undertaken by the Company at 400025/120000v Substation & Jhajhar-05 Substation of the Company (see the Phase IV, Part I Projects, underpin working noted)

Sr. No.	Description of Work	Estimated Value (Bd. GST)	Remarks
1	Construction of Phase IV Camp-cum-Field Hostel	Rs.2.45.14,800/-	Both the substations are very remote and also prone to security threats.
2	Construction of Security Barrack- cum-Field Hostel for Police.	Rs.1,23,89,450/-	With these facilities, the employees and security guards may reside there and maximum control can be exercised from there.
3	Construction of 1000sqm store building of size 25m x 40m for GSO spare parts	Rs.1,26,87,000/-	Requirement as per HOD/HQ/00000000000000000000
	Estimated Cost for 400025/120000v Sub	Rs.4,71,21,000/-	-
	Total Estimated Cost for 02 no Substation	Rs.9,45,51,180/- = Rs.9.5 Crore	-
4	Plan, Purchase of land 500m x 100m and Construction of RCC approach road at near 400025/120000v Substation of the Company.	Rs.8.07 Crore (including land cost of Rs.4.5 Crore)	* Purchase of land captured under open tendering.

The Board was apprised that the above works were expected to improve the accessibility and O&M of the concerned substations of the Company.

Certified True Copy

For Bihar Grid Company Limited



 (Name) Secretary, Bihar Grid Company Limited



बिहार् ग्रिड कम्पनी लिमिटेड - 2nd Floor, Akshar Plaza, Boring Road, Patna - 800 001, Bihar - 800 001 Regd. Office : 2nd Floor, Akshar Plaza, Boring Road, Patna - 800 001

Value Addition Works being undertaken under Phase-II Works of the Company

The Board is apprised that some value addition works are being considered to be undertaken under the Phase-II, Phase-II Projects.

- A. Following works are being considered to be undertaken at 400/220/132/33kV Nandpur GIS Substation and 400/220/132/33kV Jankapur GIS Substation of the Company under open tendering.

S. No.	Description of Work	Estimated Value (Est. GST)	Remarks
1.	Construction of Fenced Camp/our Field House	Rs.2.45,18,222/-	As the SS are very remote and also prone to security threats.
2.	Construction of Security Barracks, cum Field Halls for Fillets	Rs.1.25,80,482/-	With these facilities, the employees and security guards may reside here and maximum output can be extracted from them.
3.	Construction of business store building of size 15m x 30m for GIS spare parts	Rs.1,00,87,825/-	Requirement as per P&ID/PSRD norms.
Estimated Cost per 400/220/132/33kV Substation		Rs.4.71,76,529/-	—
Total Estimated Cost for 02 no. Substations		Rs.9.43,54,182/- +GST Rs.9.5 Cr.	—

- B. In addition to the above, an approach road is required at 400/220/132/33kV Nandpur GIS Substation of the Company. At present the road to Nandpur Substation passes through a narrow road in Jankpur village, through which transformers cannot be transported. All the transformers have been transported through a temporary road from highway by-passing the narrow road of Jankpur village.

Hence, it is envisaged that a land measuring 250m x 10m may be purchased. Mud with soil and construction of PCC road may be done at an estimated amount of Rs.5.00 Cr. (approx.). It may be noted that an amount of approx. Rs.38 Cr. was approved by the Board towards the cost of land for 400/220/132/33kV Nandpur GIS Substation of the Company vide Board Resolution No. 24-2-T, dated 21.03.2019, against which the booked cost of the land of the said substation is Rs.25.80 Cr.

G.M./P.E.S.M. & Co.
A.G.C.L.

बिहार ग्रिड कम्पनी लिमिटेड (नामगुप्त एमएलए बिहार स्टेट पावर (होल्डिंग) को. लि. एवं पावरग्रिड) BIHAR GRID COMPANY LIMITED

(Joint Venture of Bihar State Power (Holding) Co. Ltd. & POWERGRID)

डिप्टीम हल, जलजल पोल, बोरिंग रोड, पटना-800 001, दूरभाष : 9612-2530477 (कार्यालय)
2nd Floor, Akshar Plaza, Boring Road, Patna-800001, Tel. 0612 2530477 (Off), E-mail : bihargrid@bgrid.com



बिहार ग्रिड

GRV : 14071006N20100100100702

Ref: JAPT/EG/Consolidated/Minerals-18

Date: 12.12.2024

Extracts of the Minutes of the 45th meeting of the Board of Directors of Bihar Grid Company Limited held on Monday, 30th September, 2024 at 12:15 p.m. at BSGH-6GL, Vidyal Bhawan, Bailey Road, Patna-800001, through Video-Conferencing.

45.2.1 To approve the value addition works undertaken at Naulbatpur and Jaskanpur Substations of the Company.

"Resolved that, approval of the Board, be and is hereby accorded to the estimated cost of the following works at 400/220/132/33kV Naulbatpur and Jaskanpur GIS Substations of the Company under Phase-IV, Part-II projects of the Company to be done under Open Tendering method.

Sl. No.	Description of Work	Estimated cost
1.	Construction of Security Barrackcum-Field Hostel for Officers 1- Naulbatpur 2- Jaskanpur	Rs.1.26 Crore Rs.1.26 Crore
2.	Construction of Fuelless Store Building for GIS operation 1- Naulbatpur 2- Jaskanpur	Rs.1.01 Crore Rs.1.01 Crore
	Total cost estimate	Rs.4.54 Crore

"Resolved further that any Director or the Company Secretary of the Company be and are hereby specially authorised to sign and execute all the required papers and to do all such acts and deeds and to take all the necessary steps in this regard to give effect to the above resolution."

Certified True Copy
For Bihar Grid Company Limited

(Signature)
(Niketa Sinha)
Company Secretary

(Signature) *(Signature)*

(Signature)
For the Jd.

पंजीकृत कार्यालय : डिप्टीम हल, जलजल पोल, बोरिंग रोड, पटना-800 001 Regd. Office : 2nd Floor, Akshar Plaza, Boring Road, Patna-800

901211

DOI: 10.1002/comp.10013

STUDY OBJECTIVES: To determine the prevalence of and risk factors for

URL: <http://dx.doi.org/10.1016/j.jmb.2010.05.009>

1999-2000

Note: Administrative approval for construction of 11 CR items as per BACT. Flagg District as 2001/12/18/1. CRs District CR 5-6.

- 128/132/33 K.V New Damsan GIS substation is under commercial operation since Dec-2020 and supplying power to Hanoi and An Dienlat as a part of Strengthening of Transmission System in Hanoi under Phase IV, Part B.

Figure 1

- H1 not, indeed more constructed at Daresbury (Rutherford) site under 95-40 package and some is using for A/B spaces and other future spaces, however, indeed more not suitable for GDS Spaces.
- Presently 220kV GDS space and 132kV GDS Space-Tel Rail are kept in the 220kV GDS Hall - future use.
- New NSP/CL, started 220kV GDS top extension for 220kV DC, Overhead (RACCL) - Channel / Daresbury (EPPL) after construction of this new bay, they have space left over for available 220kV & 132kV GDS Space-Tel Rail and may require to shift 220kV & 132kV GDS Space from 220kV GDS Hall to new location near at Daresbury (RACCL).

Proposed for Administrative Approval: Construction of a new 175,000 sq ft Restaurant (R/C) at

- As mentioned above, 60 bus stop space not suitable for GIS space and 180 After construction of new 220kV GIS bays in 220kV GIS Hall, we don't have any indoor space for 220kV & 110kV GIS bays hence, it seems necessary to construct a GIS store at District Sub-station so that we may shift all the available 220kV & 110kV GIS Space (at least from 220kV GIS Hall to GIS store in project context).
- The drawing for construction of GIS Store using for Nymbur & Sahibpur may also be used for GIS Store- Ghumna also.
- Therefore, it is proposed for administrative approval for construction of 04 GIS store for 220kV & 110kV GIS bays for proper up-keeping at 220/110/33kV GIS Sub-Station Ghumna.

Received 10 April 2003; accepted 10 June 2003

Construction of Trussless roof store building of size 20m x 15m for GIS spare parts							
Sl. No.	BSM-2015 (BOM)	Description	Unit	Rate	Qty	Amount	Remarks
		CRB-Subcontract Item					
1	1.1.1	Earth work in excavation by mechanical means (hydraulic excavator) excavated areas in foundation trenches or drains not exceeding 1.5m in width or 10m in plan, including drawing of sides and ensuring of bottoms, for all lift including getting out the excavated soil and disposal of surplus excavated soil as directed, within a limit of 50m. All kinds of soil.	cum	266.00	117.000	31122.00	
2	1.191.1	Excavating trenches by mechanical / manual means or required width by pipes, cables, etc including preparation for cables, and drawing of sides, flattening of bottoms, for all depths including getting out the excavated soil, and then returning the soil as required, to depth not exceeding 20 cm in depth, including consolidating such deposited layer by ramming, watering, etc, and disposing of surplus excavated soil as directed, within a limit of 50 m. All kinds of soil Pipes, cables etc, not exceeding 10mm dia.	cum	113.00	20.000	2260.00	
3	1.191.2	Excavating trenches by mechanical / manual means or required width by pipes, cables, etc including preparation for cables, and drawing of sides, flattening of bottoms, for all depths including getting out the excavated soil, and then returning the soil as required, to depth not exceeding 20 cm in depth, including consolidating such deposited layer by ramming, watering, etc within a limit of 50 m. All kinds of soil Pipes, cables etc, exceeding 10mm dia but not exceeding 150mm dia.	cum	192.15	11.000	2113.65	
4	1.20	Filling available excavated earth (including rock) to reaction, planks, sides of foundations etc. to depth not exceeding 10m in depth, consolidating such deposited layer by ramming and watering, limit up to 50 m and for all lift.	cum	190.00	200.000	38000.00	
5	1.26.1	Items for every additional lift of 1.5m or part thereof to excavation/ boring excavated or drilled materials. All kinds of soil.	cum	126.00	30.000	3780.00	
6	1.34.1	Supplying chemical solution in sealed containers including delivery as specified, Chlorophane Limited available concentration of 20%.	litre	234.75	183.000	42958.50	
7	1.35.2.1	Drilling and injecting chemical solution by PVTY-COMBUSTIONALJ, and similar equipment (including the cost of chemical solution) along the excavated and before concrete or masonry apron using chemical solution, 1000liters per linear meter include lay offing and plugging before etc. With Chlorophane Limited L.C.20% with 1% concentration.	cum	33.00	30.000	990.00	

Sl. No	Q&A-2023 (UPPCL)	Description	Unit	Rate	Qty.	Amount	Remarks
8	1.10.1.1	Deliming and regrouting chemical treatment for PCC/CONCRECTIONAL and concrete structures (including the cost of chemical treatment). Treatment of wall under existing floor using chemical treatment (flow line per hole, 30mm apart including drilling 12mm diameter holes and plugging with cement mortar 1:2:1 cement: 2 coarse sand) to reach the existing floor. With Chlorophosphoric trihydrate 10% (10%) with 1% retensifier.	sqr	110.00	100.000	11000.000	
9	4.1.1	Providing and laying in position concrete concrete of specified grade, including the cost of cementing and plastering - All work up to plinth level. 1: 1: 3 (1) Cement: 4 coarse sand (zone-II) derived from natural sources; 3 graded river aggregate (Zone retained size derived from natural sources).	cum	100.000	80.000	8000.000	
10	4.1.1	Covering and shuttering including strutting, propping etc. and removal of form work for Foundations, footings, beam for columns.	sqr	182.17	15.000	1752.17	
11	4.1.1	Making plain protection floor thick of concrete (sample 1: 3: 6 (1) cement: 3 coarse sand (zone-II) derived from natural sources; 3 graded river aggregate (Zone retained size derived from natural sources) over floor thick part of dry brick masonry (Zone retained size derived from natural sources) and wall treated and consolidated and grouted with lean sand, including necessary reinforcement, finishing & plastering & rendering for top smooth.	sqr	549.30	55.000	44211.50	
12	1.1.2	Providing and laying in position specified grade of reinforced concrete concrete, including the cost of cementing, plastering, finishing and reinforcement - All work up to plinth level. 1: 1.5: 3 (1) cement: 1.5 coarse sand (zone-II) derived from natural sources; 3 graded river aggregate (Zone retained size derived from natural sources).	cum	934.71	60.000	56082.600	
13	1.1.2	Reinforced concrete concrete work in walls and structural, including stacked pillars, balustrades, pillars and wing columns, floor, columns, pillars, plates, slabs, beams, posts and doors etc. above plinth level up to floor line level, including cost of cementing, plastering, finishing and reinforcement. 1: 1.5: 3 (1) cement: 1.5 coarse sand (zone-II) derived from natural sources; 3 graded river aggregate (Zone retained size derived from natural sources).	cum	1081.07	18.000	19459.260	
14	2.3	Reinforced concrete concrete work in beams, suspended floor, walk having slope up to 10° loadings, balustrades, columns, chajjas, larch, beams, plate window etc. columns and spiral cast over above plinth level up to floor line level, including the cost of cementing, plastering, finishing and reinforcement with 1: 1.5: 3 (1) cement: 1.5 coarse sand (zone-II) derived from natural sources; 3 graded river aggregate (Zone retained size derived from natural sources).	cum	11503.70	20.000	245074.000	
15	1.1.1	Covering and shuttering including strutting, propping etc. and removal of form for Foundations, footings, beam of columns etc. for new concrete.	sqr	182.17	80.000	17526.76	
16	1.1.1	Covering and shuttering including strutting, propping etc. and removal of form for Foundations, beams, plates, beams, pillars, balustrades and canopies.	sqr	178.40	180.000	32112.000	

Sl. No.	BSM-2023 (T18.01)	Description	Unit	Rate	Qty.	Amount	Remarks
17	4.0.6	Centering and shuttering including strutting, propping, etc. and removal of form for Columns, Pillars, Piers, Abutments, Retaining Walls		960.30	218.000	209,271.00	
18	4.0.10	Centering and shuttering including strutting, propping, etc. and removal of form for Slab, Chajja, Coffer, etc., including edge		950.30	55.000	52,165.50	
19	3.11.1	Extra for additional height in centering, shuttering when extra required with adequate bracing, propping etc., including cost of de-shuttering and dewatering at all levels, over a height of 3.7m, for every additional height of 1 meter or part thereof (Plan area to be measured, Suspended floors, roofs, landing, basins and balconies (Plan area to be measured)		104.00	198.000	10,400.00	
20	M-3.12.4	Good subgrade for RCC work including subgrading, cutting, leveling, placing in position and binding all complete upto M.I. level. Thermo-Mechanically Treated base of grade 10-1000 or more.	kg	101.00	4500.000	46,950.00	
21	5.10	Add for plaster etc. cover/ given in detailed specifications or according to RCC proportions		78.40	45.000	3,518.00	
22	6.1.2	Brick work with common burnt clay FFB (non modular) bricks of class designation 7.5 in foundation and plinth in Cement mortar 1:4:1 (cement:bricks: sand)		7102.25	3.000	21,306.75	
23	6.1.2	Brick work with common burnt clay FFB (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor level in all stages and sizes in Cement mortar 1:4:1 (cement:bricks: sand)		6105.55	100.000	6,10,554.75	
24	6.15.2	Half brick masonry with common burnt clay FFB (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor level. Cement mortar 1:4:1 (cement:bricks: sand)		1123.00	70.000	78,610.00	
25	7.0.6.1	Forming and fixing WS, gills or required pattern work frames of windows etc. with WS film, square or round bars etc. including priming coat with approved wood primer all complete. Fixed to openings/ wooden frames with steel plugs screws etc.		128.30	70.000	16,981.50	
26	11.4.1	Cement plaster skirting up to 15cm height, with cement: sand 1:1:1 cement: 3 parts sand, finished with a finishing coat of neat cement: 1:3 ratio		662.00	12.000	7,944.00	
27	M-11.41.2	Forming and fixing in wall floor replacement - PVC coated fittings accessories for substituted Rigid PVC rain water pipes, including Coupler, conforming to IS-1590 Type A, including jointing with seal ring conforming to IS-1592, leaving 10mm gap for thermal expansion. 10 Single sockets/pipes 100mm diameter	length	600.00	45.000	1,35,000.00	
28	11.41.4.2	Forming and fixing in wall floor replacement - PVC coated fittings accessories for substituted Rigid PVC rain water pipes, conforming to IS-1590 Type A, including jointing with seal ring conforming to IS-1592, leaving 10mm gap for thermal expansion. 10mm (10mm) floor slab		175.00	4.000	7,000.00	

Sl. No	BOM/2021 (CT&RL)	Description	Unit	Rate	Qty	Amount	Remarks
29	11.4.3	Finishing and lining upblastcoated (PVC) pipe chips of each approved design to complement and (PVC) rain water pipes by means of 20x50x10mm hard wood plugs, coloured with MS colour of required length, including making both ends and lining in cement mortar 1:4 (i) cement: 4 coarse sands and making good the wall etc. complete. 170mm	each	175.00	50.000	16250.00	
30	11.4.4	Finishing and lining in the inlet mouth of rain water pipe cast iron galling 15 cm diameter and weighing not less than 400 grams.	each	54.30	4.000	217.20	
31	11.4.7	Three cement plaster of mix: 1: 4 (i) cement: 4 coarse sand	sqm	143.00	100.000	14300.00	
32	11.7.2	Three cement plaster finished with a finishing coat of sand cement of mix: 1: 4 (i) cement: 4 fine sand	sqm	425.25	155.000	65913.75	
33	11.11	Three cement plaster in two coats under base 11mm thick cement plaster 1: 5 (i) cement: 5 coarse sand finished with a top layer from thick cement plaster 1: 4 (i) cement: 4 fine sand.	sqm	118.35	400.000	47340.00	
34	11.14.1	Four cement plaster of mix: 1: 3 (i) cement: 3 fine sand	sqm	106.40	60.000	6384.00	
35	11.16.1	Discharge pipe with 1st quality surface discharge (ready mixed) having VCC cement less than 50gm/litre of approved manufacturer, of required shade and colour of complete to achieve even shade and colour. New work (here or more coats over and) including water drainage priming coat with cement primer having VCC cement less than 50 gm/litre.	sqm	183.40	500.000	91700.00	
36	11.17.1	Finishing walls with Premium Acrylic Smooth exterior paint with 20mm addition of required shade. New work (here or more coats applied @ 1 other) (single coat and including priming coat of exterior primer applied @ 5.20kg/ 10sqm)	sqm	175.20	400.000	70080.00	
37	11.22.1	Finishing with synthetic cement paint of approved brand and manufacturer of required colour to give an even shade. Two or more coats on new work over an earlier coat of suitable shade with ordinary paint of approved brand and manufacturer.	sqm	120.25	50.000	6012.50	
38	14.14.1	Preparation and consolidation of sub grade with power road roller of 4 to 12 tones capacity/PLATE VIBRATION after excavating earth to an average of 15.5 cm depth, densing to center and consolidating with road roller including making good the undulations etc. and leveling the sub grade and disposal of surplus materials less than 50 tonnes.	sqm	115.50	400.000	46200.00	
39	16.3.1	Supplying and stacking at site 50mm to 40mm size stone aggregate	cum	2000.40	50.000	100020.00	
40	16.3.2	Supplying and stacking at site 40mm to 20mm size stone aggregate	cum	1476.00	50.000	68800.00	
41	16.3.3	Supplying and stacking at site 20mm to 12.5mm size stone aggregate	cum	1441.50	50.000	62075.00	
42	16.3.4	Supplying and stacking at site, from surrounding 12.5mm nominal size (Type II)	cum	2004.10	50.000	100205.00	
43	16.3.10	Supplying and stacking at site, Blockium	cum	768.25	12.000	9219.00	

Sl. No	BS-85:2020 (CIVIL)	Description	Unit	Rate	Qty	Amount	Remarks
44	18.4	Laying, spreading and compacting stone aggregate of specified sizes as per specifications to uniform thickness, hand picking, rolling with 3 wheeled road rollers roller 5-10 cum capacity in stages in proper grade and camber, applying and brooming superior type of sealing/finishing material to fill up irregularities of coarse aggregate, watering and compacting to the required density.	cum	1046.93	123.000	128764.00	
45	18.49	Providing and fixing pre-castbed joint filler in expansion joints of RCC roads/CE pavements after making the joint clean free with high pressure air jet cleaners, all complete as per direction of the Engineer-in-Charge. (Pre-castbed joint fillers shall be made of bitumen hot sealing compound impregnated fibre based having impregnation more than 50%, conforming to IS 1828 for fibre based and IS 1884 for hot sealing bitumen compound grade A.)	per-cm depth per cm width per metre length	1.36	153.000	208.00	
46	18.46.1	Providing and fixing in position rubber and bitumen hot sealing compound for sealing of expansion joints in roads pavements all complete as per direction of the Engineer-in-Charge. Using grade'A' sealing compound conforming to IS 1828.	per-cm depth per cm width per metre length	8.83	100.000	883.00	
47	18.15.20 (18.75, 5.33.1.1 (1.12)	Providing and laying C. C. pavement of normal mix concrete concrete 1:1.5:3 (1 content 1:1 content sand 3 graded stone aggregate (other normal size). The ready mixed concrete shall be laid and finished with normal hand vibrator, vacuum de-airing process and finally finished by floating, brooming with wire brush etc. complete as per specifications and directions of Engineer-in-Charge. (The joint chattering work shall be paid for separately).	sqm	6180.00	75.00	46350.00	
48	56.21.1.2.2	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extended half up standard cellular sections/ appropriate 2 sections and other sections of approval make conforming to IS 761 and IS 1281, fixing with steel fasteners of required size and dist. including necessary fitting up the joint of sections, i. e. at top, bottom and sides with required EPDM/rubber neoprene gasket etc. Aluminium sections shall be straight, run free, straight, square and pointed mechanically wherever required including cham angle, Aluminium snap heading for glazing paneling, C. P. bars/ stainless steel screws, all complete as per tender drawings and the directions of Engineer-in-Charge. (Glazing to be paid for separately) All sections as given in the drawing has to be followed.	kg	176.43	43.000	7676.00	
49	21.3.2	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with EPDM rubber/ neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer-in-Charge. (Cost of aluminium snap heading shall be paid in basic rates. With float glass price of 2000 Rs/square (weight not less than 12.5kg/sqm)	sqm	1858.24	8.000	14865.92	

SL. No.	BS&S/2020 (L.THE.)	Description	Unit	Rate	Qty.	Amount	Remarks
10	21.1.1	Filling the gap in between aluminium frame & adjacent RCC/ Brick frame work by providing suitable surface plaster over 'sucker' bed of approved quality as per architectural drawings and direction of Engineer-in-Charge complete. Up to frame depth and frame width.	sqm	96.75	18.000	1741.50	
11	551	Unit: NS based on DMR rates. Laying, spreading and compacting stone aggregate of specified size 40MM-40MM 50MM specifications to achieve thickness of 02 layer 100mm each , hand picking, sorting with vibratory sieve/plane vibrator to sieve to proper grade and number, applying and spreading, and filling interstices of coarse aggregate with sand or bedding and compacting .	cum	1096.71	148.00	162311.40	Rate based on DMR-23 items. Analysis attached
12	551	Unit: Non-Scheduled Items Providing and fixing all supported wall of Profiles or equivalent of color coated Galvalume sheet of minimum free material thickness 0.60mm and including all fixings and accessories.	sqm	2550.00	118.00	300900.00	Budgetary Question
13	551	Providing and fixing 14 inch diameter aluminium tube columns with 42 types of diameters of 8.50 mm thick top and bottom 50/504 double Z bracing permanently joined with all type of fixings.	each	9000.00	4.00	36000.00	Budgetary Question
14	554	Supply of hanger clamps for fixing large and less as per requirement.	each	100.00	15.00	5000.00	Budgetary Question
15	553	Providing and fixing 2 mm thick polycarbonate transparent sheet coated with 20 micron 1/2 type at top and bottom (each sheet shall be of 3.65 m wide and 7.0 long) for natural ventilation of light.	each	1500.00	4.00	6000.00	Budgetary Question
16	556	Providing and fixing chicken wire mesh during plastering work at the junction of RCC and brick work as per direction of Engineer-in-Charge including cost of materials, transport etc. all complete.	sqm	10.00	240.00	11200.00	LGA rate, based on C/Marigach (5% IR) evaluated with 15% [14638.771.15]
17	556-1	Providing and fixing machine galvalume coated and non-mechanical operation rolling shutter respectively designed/grades with wind locks for high wind velocity exposed stations. The lock of shutter shall be made of min. 1.80mm thick single channel galvalume steel & with guide height of min. 1.80mm. The side guides shall be min. 1.80mm thick galvalume steel with hydraulic seals fitted on the shutter drive for friction less movement within the guides. The head shall be made of min. 1 mm thick painted galvalume sheet, bottom profile, locking arrangements, shaft support bracket shall be provided as per manufacturer specification. Left, Side Guides, Head & Motor cover, bottom profile, shaft & brackets etc shall be finished with Two coats of polyurethane spray paint over one coat of epoxy primer. Rolling shutter shall be provided with drive driven by motor of sufficient capacity with safety mechanism, control switch, push button etc complete. The rolling shutter shall be provided for manual operation such as mechanical device, chain and crank operation for opening/closing shutter.	sqm	60000.00	12.00	600000.00	LGA rate, based on C/Marigach (5% IR) evaluated with 15% [14638.771.15]

Sl. No	BS&S 2012 (S.F.F.B.)	Description	Unit	Rate	Qty.	Amount	Remarks
	BS&S 2012 (S.F.B.S)	Electrical Subcontract Items					
38	1.17.1	Supplying and drawing following sizes of PVC/PVC insulated copper conductors, single core cable in the existing surface/covered steel/PVC conduit as required 1 x 1.5 sq. mm	Mtrs.	45.00	40.00	1800.00	
39	1.17.1.1	Supplying and drawing following sizes of PVC/PVC insulated copper conductors, single core cable in the existing surface/covered steel/PVC conduit as required 2 x 2.5 sq. mm	Mtrs.	90.00	120.00	10800.00	
40	1.17.1.1	Supplying and drawing following sizes of PVC/PVC insulated copper conductors, single core cable in the existing surface/covered steel/PVC conduit as required 3 x 2.5 sq. mm	Mtrs.	135.00	30.00	4050.00	
41	1.17.1.1	Supplying and drawing following sizes of PVC/PVC insulated copper conductors, single core cable in the existing surface/covered steel/PVC conduit as required 4 x 2.5 sq. mm	Mtrs.	177.00	50.00	8850.00	
42	1.21.1	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/above including cutting the wall and making good the same in case of removal/conduit as required: 20 mm	Mtrs.	120.00	120.00	14400.00	
43	1.21.2	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/above including cutting the wall and making good the same in case of removal/conduit as required: 25 mm	Mtrs.	140.00	20.00	1960.00	
44	1.21.3	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/above including cutting the wall and making good the same in case of removal/conduit as required: 32 mm	Mtrs.	160.00	40.00	2560.00	
45	1.24.1	Supply and fixing of following modular switch / socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required : 50 A switch	No.	400.00	1.00	400.00	
46	1.31	Supplying and fixing suitable size GI box with modular plate and cover as shown in surface or in racks, including providing and fixing 4 pin 50 A & 15 A modular socket outlet and 10/16 A modular switch, connections etc. as required	No.	100.00	0.00	1170.00	
47	2.4.2	Supplying and fixing following size, horizontal type steel pole and ground, sheet steel, MCB aluminium busbar, 415 V, in surface/above, complete with ground copper bus bar, neutral bus bar, earth bar, side bar, interconnections, number painted including working etc. as required. (But without MCB/MS/LSB busbar) 4 way, (2 + 10), Double-bus	No.	4074.00	1.00	4074.00	
48	2.10.2	Supplying and fixing 5 A m.c.b. rating, 240-250 V, 10 A, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, fitting and commissioning etc. as required (Single pole and neutral)	No.	400.00	5.00	2000.00	

N. No.	DSR-2011 (CTNVL)	Description	Unit	Rate	Qty.	Amount	Remarks
09	2.11.2	Supplying and fixing following wiring, four poles, three phase and neutral, 415 V, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MIB 100 complete with connections, testing and commissioning etc. as required	Mtr.	1100.00	1.00	1100.00	
10	2.1	Supplying with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories and providing necessary enclosure with cover plate having locking arrangement and mounting plate of 2.7 meter long etc. with charcoal cable and rack as required	Sq.	7472.00	1.00	7472.00	
11	2.7	Supplying and fixing 25 mm X 2 mm G.I strip of 0.50 meter before ground in strip earth electrode, including connections/ terminating with G.I. nut, lock, spring washer etc. as required. (Working shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50 mm)	mtr.	144.00	7.00	1008.00	
12	4.2.33	Supplying and making end termination with brass compression gland and aluminium tape for following size of PVC insulated and PVC sheathed / XLPE aluminium-conductor cable of 1.1 KV grade as required 4X 35 sq. mm (25mm) (for 2 runs of cable)	Mtr.	389.00	200.00	77800.00	
		Scheduled Non-Scheduled Items					
13	NS.1	Supplying and installation of Indirect High Bay (IHB) LED Luminaires of the following model as per direction of Engineer-in-Charge (Philips (8000W/ 14000), Cox (14000/90018.1, 18W, 9000 LED High Bay), (Harcis (8000W/ 9000), (Egip (14000/ 8000/ 1400 GTS), (Luma (8000/ 14000.0))	Mtr.	17114.41	4.00	68457.64	Analysis Attached
14	NS.2	Supply and installation of LED Tube Light (10W (Brands 10W 6000K, 18 Integrated driver LED Tube Light-500-075-840-082 or Equivalent to Philips, Cox, Harcisi, Egip 14000)	Mtr.	1025.11	20.000	20502.20	Analysis Attached

Sub Total of Scheduled Items incl. GST @ 15% (P+Q) (A)	7120876.28
Sub Total of Non-Scheduled Items (C+D) incl. GST (B)	2000402.63
Sub Total of Scheduled Items incl GST @ 15% (Excluded) (P)	173047.08
Sub Total of Non-Scheduled Items incl GST (Excluded) (Q)	88950.00
Sub Total of Scheduled Items excl. GST (incl P) (R) 1-15	6944751.2
Sub Total of Non-Scheduled Items (C+D) incl GST Q- (B)	2000402.63
Total of Scheduled Items incl. GST (Excl) R-(P) 1-15	123700.64
Sub Total of Non-Scheduled Items incl GST (Excluded) (S)-(Q)	88950.00
Grand Total Incl GST (P+Q) R-(R)	8245156.46
Grand Total Incl GST	8734455.62

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Reed, J. W., 1982. *Journal of the American Water Resources Association*, 18: 103-114.

Abstract

Caption: Construction of Hand Dancer Building at BCL at Memphis, TN

1. BGCCL is a Joint Venture Company of Bharat Heavy Power (Building) Company Ltd. and POWERGRID with its Head Quarter at 1st Floor, Akshar Place, Boring Road Crossing, Patna-800001.
2. The above mentioned Head Quarter of BGCCL is a rented property, with contract lease amount of Rs.4,15,626/- (four lakh one thousand 562/-) (Copy attached).
3. Looking into the rented property, high cost, scarcity of parking space for the BGCCL Head Quarter, during meeting with the higher officials, it was agreed that option may be explored that the Head Quarter of BGCCL may be shifted to 22B/14B/15 Bismillah St. With this option, the BGCCL Head Quarter will be shifted to new land of Suburban area, where scarcity of parking will not be issue in addition to the creation of the parking row. Moreover, the number of security personnel will also decrease.
4. It was decided that the following options should be explored:
 - a. As first instance, new extra floor may be built at the terrace of the existing Control Room Building (CRB) and some portion of the GP may be modified to make hall. Total loading of the extra floor may be reduced by using Profiled Roofing System wherein concrete roof with Gypsum sheet will be used. Also, the wall shall be constructed using Autoclaved/Aerated Concrete Blocks (AAC Blocks) which are very light in comparison to the normal bricks.
 - b. If the above option is not feasible, then extension of the existing CRB may be done. The extension will be done in the front portion.
5. In view of the above, a consultant M/s Mace N Ward, New Delhi was hired for the above work vide L.O.M. No. JP-PT/BO/CL/BO/CL-403 dated 12.08.2013 (copy attached). After working out with the structural drawings of the existing CRB and the loading envisaged for the upcoming structure, the consultant advised that the existing frame are not capable to take up the additional load of the proposed floor (Copy of Architect's report attached). Hence the option of constructing one floor above the existing Control Room Building (CRB) was rejected and consultant was asked to go for second option i.e. construction of additional building in the vacant area in front of the existing CRB and modification of the existing CRB to match with the new building. It was also informed to the consultant that the new building shall be designed for G+2. However, construction shall be done of G+1 at present.
6. The consultant then submitted two alternatives of the layout. After regular interactions, one option was accepted and informed to the consultant for detailed engineering and preparation of estimate for the work. The floor plan layout of the project and Elevation and Section is attached.
7. The consultant submitted the estimate and after long discussions and deliberations, the estimate for the work was finalized. Vide their letter dated 05.09.2014, Consultant, M/s Mace N Ward, submitted the estimate and Rate analysis of the New Scheduled (NS) items (Copy of Estimate & Rate Analysis is attached). Total estimate for construction of 02 building of BGCCL at Bismillah St works out to Rs.3,89,58,880/- (just G+1) and Rs.4,96,09,309/- (just G+2) (Copy of Estimate and Rate analysis attached). The above estimate includes the Civil & Sanitary work, Electrical work, Fire Fighting Work, Lift and EVAC work, Cost of furniture, Special Security works (if required) has not been taken in the present Estimate. Some will be taken separately.

S. No.	Description	Amount of Sdk. Items (incl GST @18%)	Amount of Nv. Items (incl GST @18%)	Total Amount (incl GST @18%)	Rate
3.3	Civil & Sanitary Items	1,81,21,450/-	11,76,475/-	1,92,97,925/-	80
3.4	Electrical Work	79,23,660/-	12,43,170/-	91,66,830/-	80
3.5	Fire Fighting Work	1,79,840/-	2,05,940/-	4,18,780/-	80
3.6	HVAC Work	14,81,310/-	18,43,180/-	33,24,490/-	80
3.7	Lift		12,72,660/-	12,72,660/-	80
	Total	1,76,78,110/-	44,75,750/-	2,21,53,860/-	
	Adding 1% for BQP costs			2,24,080/-	
	Grand Total			2,24,080/-	8

8. The estimate has been worked out as following to viz:

- Civil & Sanitary Work:** Rate has been taken from DSR2003 for scheduled items and Market Rate for Non-scheduled items. The rate of DSR2003 is inclusive of GST @ 18% and the Market Rate is inclusive of 18% GST.
- Electrical Work:** Rate has been taken from DSR2007 (B&M) for scheduled items and Market Rate for Non-scheduled items. The rate of DSR2007 (B&M) is inclusive of GST @ 12% while the Market Rate is inclusive of 18% GST. The amount of scheduled items have been modified for GST @ 18% by multiplying with cost of $(1.18/1.12) = 1.0535$.
- Fire Fighting Work:** Rate has been taken from DSR2012 (L&M) for scheduled items and Market Rate for Non-scheduled items. The rate of DSR2012 (B&M) is inclusive of GST @ 12% while the Market Rate is inclusive of 18% GST. The amount of scheduled items have been modified for GST @ 18% by multiplying with cost of $(1.18/1.12) = 1.0535$.
- HVAC Work:** Rate has been taken from DSR2010 (VBN/VBP) and DSR2012 (B&M) for scheduled items and Market Rate for Non-scheduled items. The rate of DSR2010 (VBN/VBP) and DSR2012 (B&M) is inclusive of GST @ 12% while the Market Rate is inclusive of 18% GST. The amount of scheduled items have been modified for GST @ 18% by multiplying with cost of $(1.18/1.12) = 1.0535$.
- Lift:** Rate has been taken from Market Rate which is inclusive of 18% GST.
- Based on the above, the estimate including GST have been worked out.
- 1% of the estimate has also been considered for contingency to be borne by agency for meeting as per BQP.

9. Other Details will be as follows:

- Budget:** Budget may be fixed at Project Phase (I, II, III & IV).
- Technical Specification:** All the schedule items shall be as stated as per CPWD specification & other relevant.

- (ii). Completion Period: 250 weeks
- (iv). **STQP:** Revised standard Tendering plan no C/FG/09-QP/5178-4/111-001 Revised, Date of Issue 05/06/2018 shall be applicable for this work
- v. **Mode of Tendering:** Open Tender
10. The matter for the construction of permanent Road Quarters of BRCL at Bhimnagar was put up in the 10th meeting of BoD BRCL Exempt 40.1.01 - Copy attached, wherein Board agreed "In Principle". However, they directed to come up with some specific details regarding Construction and operational cost of permanent building.
11. After approval of the above proposal, tendering process may be initiated and Board approval may be sought before award.

In view of the above, it is proposed to seek approval of the following:

- a. Construction of HQ Building of BRCL at Bhimnagar Station.
- b. Estimated cost of the above work as Rs 5.15,35,000/- (not GST) and Rs 6,06,06,000/- (incl GST)
- c. Tendering may be done as OPEN TENDERING.

Submitted for approval please

(Arun Kumar)
Ch. Mgr, Engg.

Sd. GM (Engg.)
Sd. DEPR/HB
Sd. GM (Prog)
GM (P&T)
MR (BGCL)

ABSTRACT OF ESTIMATE FOR PROPOSED BGCL HQ AT BHUSAULA SS PATNA					
S. No.	Description	Sub. Items (incl. GST @ 18%)	New Sub. Items (incl. GST @ 18%)	Total (incl. GST @ 18%)	Total (incl. GST)
1	Civil Work.	3,62,33,463	21,96,678	3,84,29,141	
2	Electrical Work	79,33,668	32,43,278	1,11,76,946	
3	Fire Fighting Work	4,11,827	5,02,048	9,13,875	
4	IT/AC	58,01,823	85,84,307	1,43,86,130	
5	Lab		22,72,665	22,72,665	
	TOTAL	4,79,86,487	99,77,773	5,79,64,199	4,91,11,195
	Adding 1% for S&QP items			5,79,642	4,91,112
	GRAND TOTAL			5,85,43,842	4,96,13,407

(Joint Venture of Hainan State Power (Holding) Co., Ltd. & POWERSON)



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Annexure-III



Bihar Grid Company Limited **(BGCL)**

Detailed Project Report (DPR) **Approval of the Govt. and estimates**

Name of the Work –

“Approval for the upgradation of existing Substation Automation System (SAS)
system in Phase-IV, Part-I Projects”

बिहार ग्रिड कम्पनी लिमिटेड

(संयुक्त उद्योग बिहार स्टेट पावर (होल्डिंग) कं० लि० एवं पावरग्रिड)

BIHAR GRID COMPANY LIMITED

(Joint Venture of Bihar State Power (Holding) Co. Ltd. & POWERGRID)



बिहार ग्रिड

टिडीय रोल, अलंकार प्लेस, बॉयल रोड, पटना-800 001, दूरभाष : 0612-2530477 (कार्यालय)

2nd Floor, Alankar Place, Boring Road Patna-800001, Tel : 0612-2530477 (Off), E-mail: bharugb@gmail.com

CIN : U40102BR2013PLC019722

Ref: JNPT/SG/Compsec/BM-Extracts-BV

Extracts of the Minutes of the 55th meeting of the Board of Directors of Bihar Grid Company Limited held on Friday, 10th April, 2020, at 11.00 a.m. at Vidyut Bhawan, Bailey Road, Patna-800001, through online audio video mode.

55.2.5 ‘In-principle’ Approval for the upgradation of existing Substation Automation System (SAS) system in Phase-IV, Part-I Projects:

The Board was apprised that as per the CERC guidelines, the useful life expectancy of IT systems, SCADA, and communication systems (excluding OPGW) was considered to be 7 years. Accordingly, the Substation Automation System (SAS) installed in all GIS Substations of BGCL under Phase-IV, Part-I works had already completed 7 years of service.

Hence, it was proposed to upgrade the existing Substation Automation System (SAS) installed at the GIS substations constructed under Part-I Projects. It was submitted that the said work was estimated to have a total financial implication of an amount of Rs.12.00 Crore, excluding GST and F&I which might be booked under the ‘Additional Capitalization’ budget.

The Board considered the same and directed to submit a detailed technical presentation along with the funding details before the next meeting to make a decision in this regard. It was further directed that a Petition be put up before the approval of the Hon’ble BERC for meeting the said expenditure under additional capitalization.

Certified True Copy
For Bihar Grid Company Limited
Bihar Grid Company Limited


Niketa Sinha
(Niketa Sinha) Company Secretary
Company Secretary
27/4/20


S. S. Sinha
S. S. Sinha
27/4/20

O&M DEPARTMENT

Ref. No.- JV/PT/OG/ES SAS upgradation/

Date:-01/01/2025

Sub: In-principle approval for upgradation of existing SAS at various DGCI sub-stations under additional capitalization budget.

Details of Substation of existing SAS-system:-

Sl. No	Name of Substation	SAS make	Date of commissioning	Operating system
1.	Shreebhagwan	ABB	21.12.2017	Windows7
2.	Shreebhagwan	ABB	27.04.2018	Windows7
3.	Mallapur	ABB	18.02.2022	Windows7
4.	Coradih	ABB	24.01.2024	Windows 7
5.	Dhyanpur	Siemens	05.05.2017	Windows7
6.	Akagaur East	Siemens	09.05.2018	Windows7
7.	Hajipur East	Siemens	18.04.2017	Windows7
8.	Narhat	Siemens	18.05.2017	Windows7
9.	Keshpur	Siemens	17.04.2017	Windows7

Requirement/Reason:

As per the CERC guideline, the useful life expectancy of IT systems, SCADA, and communication systems including OPGW is considered to be 7 years. Further, as mentioned above, most of the SAS stations installed in Rect 1 substation have already completed 7 years of service, and some substation have completed 8 years.

Further, the existing servers and gateways are operating on Windows 7 OS, which has already become obsolete. Running systems on an outdated operating system involves a high level of risk as there is no official support available in the event of unforeseen incidents such as system crashes or data corruption. Details of the SAS system are provided in Annexure-III.

i. Due to the obsolescence of Windows 7, Microsoft no longer releases security patches for newly identified vulnerabilities. This poses a significant cybersecurity threat to the system.

ii. In the existing SAS system, several issues are being encountered, such as:-

- Freezing of logged inputs
- Delay in receipt of GOOSE signals
- IEC communication failures
- Delay in fetching historical data
- BCU tripping

All other associated systems are also operating on Windows 7.

iv. Therefore, it is proposed to upgrade all Windows 7-based systems and Computers to Windows 10, along with a lifecycle support period of 7 years.

iv. Microsoft discontinued support for Windows XP in April 2014 and for Windows 7 on 14 January 2020.

v. The Gold of the S&S systems has also discontinued services for S&S systems based on Windows XP and Windows 7. They have recommended upgrading to Windows 10-based S&S systems. Since Microsoft has declared end-of-life for both Windows XP and Windows 7, no other solutions for these operating systems are no longer available, making all S&S systems relying on them vulnerable from a security standpoint.

vi. To protect S&S and relay-interfacing systems from malware and cyber-attacks, and to ensure trouble-free operation, it is proposed to upgrade all Windows 7-based S&S and related operational software to Windows 10.

vi. Running S&S system on obsolete operating systems involves a high risk of system failure, as Microsoft no longer provides support for issues such as system crashing or corruption.

Additionally, the current S&S system operating on Windows 7 is experiencing various technological issues, including freezing of logical inputs, delays in receiving GDOCE signal, SPS communication failures, delays in retrieving MII data, and SCD hanging.

Cost Estimates Basis

The estimate has been prepared based on the techno-commercial offer from M/s Nitari who their quotation dated 11.12.2023 (attached at Annexure III). The total financial implication for upgradation of 04 nos. S&S as per the detailed BQD work out to be Rs. 12.60 Crores/- (Rs. Works (BOM + Freight + Supervision of Testing & Commissioning) and excluding Taxes.

Budget Provision

It is planned to upgrade the 04 nos. S&S system in accordance with the ADD L&P provisions of CIRC/SEPC guidelines. Hence, it is proposed to upgrade the existing Windows 7 based S&S system of various BQCs SS under Additional capitalization for the block 2024-25 due to technology obsolescence.

Submitted for approval please.

(Signature of: Singh)

Dr. Ajay (DS&M)

BQD 2023.pdf

BQD 2023.xlsx

CIRC_BQCs_S&S Upgradation Budgetary Offer 11.12.23.pdf

Mail correspondence ALL MEMS.pdf

01/01/2024 09:54 pm

JASDEBANT KUMAR SINGH

M/s Bikaner Power Grid Company Limited	Name	Puspen Biswas
2nd floor, Akshaya Place,	Department	SC-DI SI PSS SER EPC
Boring Rd. crossing, Anandpur,	Telephone	
Patna, Bihar 800001	Mobile	9871808158
	E-mail	puspen.biswas@siemens.com
Kind Attn: Mr. Manan Singh	Our reference	SL BGCL SAS-Upgrade/01
	Date	11.11.2023

Subject: Non-binding budgetary offer for SAS Upgradation at various Sub-Station of BGCL.
Project Name : SAS Upgradation at various Sub-Station of BGCL.

Dear Sir,

We Thankfully acknowledge the receipt of your inquiry and are please to submit our offer here below:

Offer Validity: 10.12.2023
Terms of Payment 20% advance along with PO and balance against 10 days LC from the date of dispatch.
Annexure are as Follows: Annexure 1: Techno-Commercial Offer Annexure 2: Siemens Standard T&C.

We hope our offer is in line with your requirement. Should you require any further information, please feel free to contact us.

Thanking You and assuring you of our best services all the times.
Yours sincerely,

**Biswas
Puspen**

Commercial Sales
SIEMENS Limited

Technical Sales
SIEMENS Limited



SUCCESSFUL DEPICT
SAS UPGRADE/ADDITION
- End User: 2022

Submitted by: Purnima Bhatia
Issue Date: 2022/12/11

Index

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Reference documents

[This protocol is in accordance to the IEC 61850](#)

Revision Log

Submitted by	Rev	Date	Description
John	01	2020-01-27	Initial release for IEC 61850

Document title

Document No.

Document version

2

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5.	PRICE & COMMERCIAL SCHEDULE	7

1. Subcontractor's Details

Sl. No.	Name of Subcontractor	MR Name	MR's ID/Commissioning	Working system
1.	Indraprastha	MR	27.12.2027	Windows?
2.	Paradise Nagar	MR	27.12.2028	Windows?
3.	Shiksha	MR	28.12.2029	Windows?
4.	Indraprastha	MR	29.12.2030	Windows?
5.	Shiksha	MR	30.12.2031	Windows?
6.	Shiksha	MR	31.12.2032	Windows?
7.	Shiksha	MR	32.12.2033	Windows?
8.	Shiksha	MR	33.12.2034	Windows?
9.	Shiksha	MR	34.12.2035	Windows?

1. TECHNICAL BACKGROUND INFORMATION

Following is the scope of work for this offer:

Sl. No	Documents	Comments
1	Scope & Specific Features	Our Scope is limited to Supply, Supervision of testing & Commissioning as per above BOM. Anything supplied from the above scope shall be in the scope of customer.
2	Spares	Supply of any spares is not considered in the present scope.
3	Power & Control Cable	Supply, Laying, protection of Cables starting from Switchhouse & Field for wiring of any hardware I/O Signals shall not be in our scope.
4	Commissioning	Any kind of test work is not included in our scope of work.
5	PLC/RTU/SCADA Integration	Data integration with PLC/RTU/SCADA is not considered in the present scope.
6	Training	Training is not considered in the present scope.
7	Site preparation	Our offer is based on following: 1. All the existing BOM and BOM details compliance. 2. Fundamental Fielding (thermal facilities are working properly and same shall be used). 3. Infrastructure for existing relays shall be shared by the customer. 4. Existing relays can communicate with present scope IAS. Upgradation of existing relays, if required, shall be in the scope of customer.

8. REINSTRUMENTATION

NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE
1	Reinstrumentation of the existing system	1000	1	1000
2	Reinstrumentation of the existing system	1000	1	1000
3	Reinstrumentation of the existing system	1000	1	1000
4	Reinstrumentation of the existing system	1000	1	1000
5	Reinstrumentation of the existing system	1000	1	1000
6	Reinstrumentation of the existing system	1000	1	1000
7	Reinstrumentation of the existing system	1000	1	1000
8	Reinstrumentation of the existing system	1000	1	1000
9	Reinstrumentation of the existing system	1000	1	1000
10	Reinstrumentation of the existing system	1000	1	1000

4. PRICE & COMMERCIAL STRUCTURE

PRICE LIST (USD)					
S. NO.	DESCRIPTION	UNIT	QTY	UNIT PRICE (USD)	TOTAL PRICE (USD)
1.	Upgradation of existing 33kV Feeder System	km	10	1,000,000	10,000,000
	Materials (Bund) + Freight + Supervision and Testing & Commissioning				10,000,000

Terms and Conditions:

1. Proposal: Price is 100% and is valid for 12 months, or up to the date of award of contract. Freight is included.
2. Offer validity: Offer is valid for 12 months.
3. Price validity: Price is valid for delivery of supply of 10 km of 33kV.
4. Execution timeline: Delivery timeline is 12 weeks from the date of award of contract. Supply of material is 10-12 weeks from the date of signing of contract.

Terms & Conditions:

1. **Price Validity:** Offer Prices shall remain valid till 30.12.2025.
2. **Effective Date and Project Duration:** Date of issuance of order acceptance will be the commencement of the contract & Supply will be completed on handing over the material at Siemens works within 30.09.2025.
3. **Payment Terms:** 25% payment along with PO and balance against 30 days LC from the date of dispatch. LC shall be open along with manufacturing clearance.
4. **Interest for Delay in Payment by Customer and Storage Charges:** If Siemens has completed its scope in the contract and the parts are ready for inspection / factory acceptance test and the customer fails to come for such inspection / FAT then Siemens shall have the right to charge storage and carrying cost for such parts at the rate of Rs. 15/00 per day, per square feet basis & 13% interest on cost of capital charge. Siemens shall have the right to charge interest @ 13% p.a. (over cost of capital charge) on the amounts that have not been paid by the customer on the due date as stated in the contract.
5. **Limitation of Liability:** Siemens' total liability, whether pursuant to any indemnity or in contract, tort (including negligence and breach of statutory duty) or otherwise arising by any reason of or in connection with the contract shall not exceed 100% of the original contract price without exclusion of any clauses of the contract.
6. **Consequential and Incidental Damages:** Siemens shall in no event be liable, whether pursuant to any indemnity or in contract, tort (including negligence and statutory duty) or otherwise for loss of profit or revenue, loss of production, interruption of operations or loss of use, cost of capital, loss of interest, loss of information and/or data, for claims arising from customer's contracts with third parties, loss of power, voltage irregularities, frequency fluctuations, cost of purchased or replacement power, loss of power, cost of purchased or replacement power, or for any indirect or consequential damage.
7. **Warranty:** 12 months from commissioning or 18 months from supply whichever is earlier.
8. **Extension of Time (EOT) & Claims:** Any agreed dates for performance of the works or any part thereof shall be extended by a reasonable period of time if and to the extent that Siemens is delayed or impeded in the performance of its obligations by any third party or by the failure of the customer to perform its obligations or due to any unforeseen circumstances (as the case may be), then Siemens may request an extension of time in writing. The customer shall have the right to take the decision of extension request within 7 days of receiving the written request. If the customer approves the extension request, the contract period shall be extended by a reasonable period of time as requested by Siemens. If the Customer causes delay in the project schedule or delivery timelines, the customer shall be liable to pay all reasonable costs and expenses incurred by Siemens as a result of such delay. Such costs and expenses may include, but are not limited to, additional manpower costs, overhead costs, storage costs and other direct costs associated with such delay.
9. **Liquidated Damages (LD):** Beyond agreed delivery period, LD will be applicable @ 0.5% per week delay subject to maximum 5% against undelivered portion of the material & LD is the sole and exclusive financial remedy for delay and/or failure to meet performance guarantees.
10. **Acceptance / Deemed Acceptance:** Submission of signed order acknowledgment will be treated as acceptance of purchase order, receipt of inspection clearance / waiver of the material from the customer will be treated as final acceptance of the material. All costs and expenses of the customer and any third parties (other than those of Siemens' own personnel or contractors) incurred in connection with inspections, tests, approvals, acceptance procedures, etc. shall be borne by the customer.
11. **Arbitration and Jurisdiction:** Arbitration to be as per provisions of Arbitration and Conciliation Act, 1996 and any modifications thereto and re-enactments thereof from time to time. Seat of arbitration should be at Mumbai. Applicable law should be laws in India.
12. **Statutory Variations:** During the period of the contract, Siemens is entitled to recover additional costs resulting from changes to laws, codes, standards, court rulings, or decisions made by public authorities, etc.
13. **Change Management:** Either party may at any time request in writing changes, modifications or additions to the scope of the works ('Variation' or 'Change'). Upon receipt of such Variation request, Siemens shall provide the customer with a written quotation for the requested Variation, specifying the effects of the requested Variation on the contract, including any necessary adjustment of the contract price, time schedules and agreed dates, scope of the works and any other affected provisions of the contract. If the customer wishes to proceed with a requested Variation on the basis of a Siemens' Variation quotation, the customer shall notify Siemens thereof in writing within 14 days of receipt of such Variation quotation. Siemens is not obliged to give effect to the Variation until it has been agreed in writing by the parties.

14. Suspension/ Termination:

(i) Siemens' right to suspend and/or terminate the contract for the following reasons:-

- (a) delay in customer's fulfillment of its payment obligations beyond a reasonable period; or
- (b) customer's failure to perform its reciprocal obligations; or
- (c) material breach of contract by customer; or
- (d) termination for convenience of Siemens.

(ii) **Purchasers' Rights for suspension and Termination** for the following reasons:-

(a) Material breach of contract.

(b) In case termination for Siemens' default, customer should give a written notice of the default together with a reasonable cure period to rectify the same.

(c) After reaching the aggregate cap of LD for performance and/or delay period agreed in the contract.

(ii) In case of termination, either by Siemens or by Purchaser, Siemens should be entitled to get proportionate contract price for the executed works plus the costs for the work in progress.

15. Force Majeure: A Force Majeure Event shall mean any event which is beyond the reasonable control of a party or its subcontractors, which could not have been prevented by good industry practice and which results in a party or its affiliates or any of its sub-contractors or sub-suppliers ("Affected Party") being unable to perform or being delayed in performing in whole or in part its obligations under this contract. Force Majeure Events include, among others, acts of war, riot, civil commotion, terrorism, natural disaster, epidemic, strikes, lock-outs, attacks on Siemens' IT systems (such as virus attacks, hacker attacks), non-issuance of licenses, permits, or approvals, or any other act or failure to act by any public authority, or embargos or any other trade sanctions imposed by the European Union (EU) or the United States of America (U.S.) or any public authority within EU or U.S. territory or by the United Nations which, upon sole discretion of Siemens, may expose Siemens or any of its affiliates to sanctions, penalties, loss of privileges or other acts or omissions of public authorities detrimental to Siemens or any of its affiliates, or any subcontractor or sub-supplier rejecting delivery due to reasons like those as stated herein, acts or omissions of public authorities including any entities acting on their behalf (or threats thereof), or any subcontractor or sub-supplier rejects delivery due to the same reasons.

If a Force Majeure Event occurs, the Affected Party will be deemed not to be in breach of its obligations under the contract for so long as and to the extent necessary to overcome the effects of the Force Majeure Event.

The Affected Party shall notify the other party as soon as reasonably practicable of the Force Majeure Event and of its affected obligations.

If one or more Force Majeure Events and their effect last for a period of 180 days in aggregate either party may terminate the contract by giving to the other a written notice of termination with regard to the part of the works not yet provided. Siemens shall be entitled to reimbursement from the customer of its unavoidable costs related to such termination.

16. IPR Infringement: As between the parties all intellectual and industrial property rights in the works, in all documents provided by Siemens in connection with this contract (the "Documents") and in all software, hardware, know-how (IPR), and other things provided with or as part of the works and the Documents shall be the exclusive property of and vest in Siemens. The customer shall not reverse engineer, decompile, or reproduce the Documents/IPR in whole or in parts thereof and shall ensure that third parties will not reverse engineer, decompile, or reproduce such Documents/IPR.

The customer may use the Documents unmodified and to the extent necessary for operation and routine maintenance of the works by the customer's own personnel, unless explicitly agreed otherwise in writing by Siemens.

If they include software, such software is licensed under the license terms contained in the software documentation, the software itself or in the attached license terms (in each case the "Applicable License Conditions"), which shall prevail. The software is issued in object code without source codes. The license hereunder only grants the non-exclusive right to use the software as described in the applicable license conditions, or, if no such terms are provided, for the purpose of operation and routine maintenance.

17. Set-Off : The customer shall not be entitled to set-off any amounts owed to it by Siemens against any amounts owed by the customer to Siemens, unless such set-off has been agreed to in writing by Siemens. Any unauthorized set-off by the customer shall be deemed a breach of this contract and shall entitle Siemens to terminate this contract and seek any and all available legal remedies.

Annexure-IV



Bihar Grid Company Limited **(BGCL)**

Detailed Project Report (DPR) **Approval of the Govt. and estimates**

Name of the Work –

“Approval for the establishment of Centralised Control Centre (CCC) at Bihar Grid
for better operational efficiency”

बिहार ग्रिड कम्पनी लिमिटेड (संयुक्त राज्य बिहार स्टेट पावर (होल्डिंग) को. लि. एवं पावरग्रिड) BIHAR GRID COMPANY LIMITED



बिहार ग्रिड

(Joint Venture of Bihar State Power (Holding) Co. Ltd. & POWERGRID)

डिप्टी वर, जवाहर प्लेस, सीरी रोड, पटना-800 001, गुल्शन | 0612-2536477 (कार्यालय)

2nd Floor, Akshar Place, Seering Road, Patna-800 001, Tel: 0612-2536477 (Off), E-mail: bhargrid@gmail.com

CIN : U40100BR2013PL0019732

Ref.: JAPT/2020/Compd/SM-Extracts-01

Extracts of the Minutes of the 55th meeting of the Board of Directors of Bihar Grid Company Limited held on Friday, 10th April, 2020, at 11.00 a.m. at Vidyal Bhawan, Bailey Road, Patna-800001, through online audio video mode.

88.2.4. "In-principle" Approval for the establishment of Centralized Control Centre (CCC) at Bihar Grid for better operational efficiency with a financial implication of Rs.8.68 Crores approx.

The Board was apprised that at present, the control and monitoring of substations were being carried out in a decentralized manner, which resulted in challenges related to operational efficiency, fault detection, response time, and overall system reliability.

To overcome these issues, it was proposed to establish a Centralized Control Center (CCC) equipped with advanced supervisory, monitoring, and communication systems. This CCC was expected to ensure

- Seamless and unified system oversight
- Faster decision-making
- Enhanced system reliability
- Optimized resource utilization across all substations

The overall financial implication was expected to be around Rs.8.68 Crores, excluding GST and PSI.

The Board considered the same and directed to submit a detailed technical presentation along with the funding details before the next meeting to make a decision in this regard. It was further directed that a Petition be put up before the Hon'ble NERC for considering the same as a new Project with a debt-equity ratio of 70:30.

Certified True Copy
For Bihar Grid Company Limited

Joint Bihar Grid Company Limited

(Nisha Bishoi) Nisha Bishoi
Company Secretary

Dr. / Mr. / Mrs.
[Signature]
[Signature]

BOD Cum cost estimate for supply, installation and commissioning of centralised control center for BGCL Substations.					
Sr. No.	Product Description	unit	Qty	Rate (Rs.)	Amount (Rs.)
1	2	3	4	5	
1	Design, Documentation, Supply, Supervision for Supply, Installation, testing & commissioning of SCADA system at Centralized Control Centre to support 50,000 tags as per enclosed technical details.	lot	1	6,68,34,496.00	66834496.00
		Total Amount (Rs.) Excluding GST			6,68,34,496.00
Terms and Conditions of M/S Siemens :					
1	Price basis is Ex-works Siemens India. Taxes and duties will be charged extra as applicable.				
2	Warranty considered is 3 years from the date of PAC / system handover.				
3	Offer is based on Technical Proposal enclosed. Any changes to the same will have additional commercial implication.				

Non-Binding Budgetary Price Schedule

Project: SCADA system for Bihar Grid Corporation Limited (BGCL)

Sr. No.	Description	Unit	Qty	Ex-works., Siemens Rating, India Price in INR
1	Design, Documentation, Supply, Supervision to Installation, testing & commissioning of SCADA system at Control Centre to support 50,000 tags based on the "Technical Proposal" submitted along with our offer	Lft	1	INR 68,824,400

Terms & Conditions	
1	"THIS IS A BUDGETARY PRICE QUOTE BASED ON PRELIMINARY INFORMATION. THIS IS PURELY INDICATIVE AND DOES NOT CONSTITUTE AN OFFER OR COMMITMENT NOR DOES IT CONTAIN ANY REPRESENTATION OR WARRANTY ON SIEMENS' PART. SHOULD THERE BE A REQUIREMENT TO PROCEED THIS TRANSACTION PLEASE REVERT BACK WITH DETAILS AND SPECIFICATIONS AND WE SHALL ADDRESS THE REQUEST APPROPRIATELY AT THAT TIME AND SUBJECT TO ALL INTERNAL APPROVALS AS MAYBE REQUIRED BY US."
2	Our Commercial Terms & Conditions will be submitted in the event of Firm offer.
3	Price basis is Ex-works Siemens India. Taxes and duties will be charged extra as applicable.
4	Warranty considered is 3 years from the date of PAC / system handover.
5	Our offer is based on Technical Proposal submitted separately along with this offer. Any changes to the same will have commercial implication to our offer.
6	Offer Validity: 30th March 2020
7	Following activities are excluded from our scope: -
a)	UPS System, Distribution boards, Power cabling etc.
b)	Communication backbone along with any hardware/software, FOTS, testing-equipments required for the scope
c)	Supply, Laying and termination of cables at control center and RTO locations along with electrical accessories as required
d)	Storage along with watch and ward facility for material supplied by Siemens Limited
e)	Infrastructure, layouts for control center, air-conditioning, false flooring requirements, furniture requirements, civil works etc.

Daryl Lopez
Business Unit Head – Grid Software India

Amit Khandelwal
Business Unit Finance Head – Grid Software India

Proposal No:
Date: 18.09.2020
End User: Bihar Grid Corporation Ltd. (BGCL)

Page 1 of 1

Annexure-V



Bihar Grid Company Limited **(BGCL)**

Detailed Project Report (DPR) **Approval of the Govt. and estimates**

Name of the Work –

“Approval for upgradation of loading capacity of 33kV Bays at Sheikhopur Sarai, Narhat, Bhusaula GIS Substations of BGCL and 33kV new Bay construction work at Bhusaula, Goradih and Narhat GIS Substations of BGCL”

बिहार ग्रिड कम्पनी लिमिटेड

(संयुक्त सार्वजनिक बिहार स्टेट पावर (होल्डिंग) लि. एवं एन. पावर लिमिटेड)

BIHAR GRID COMPANY LIMITED

(Joint Venture of Bihar State Power (Holding) Co. Ltd. & POWERGRID)



बिहार ग्रिड

ऑफिस गेट, कार्मल प्लेस, बोरिंग रोड, पटना-800 001, दूरभाष : 0612-2533477 (कार्यालय)

2nd Floor, Karim Place, Boring Road, Patna-800001, Tel. : 812-2533477 (O), E-mail : bhargrid@gmail.com

CIN : U40100BN2013PL001972

Ref. : BG/Comp/2013-Extends-01

Extracts of the Minutes of the 5th meeting of the Board of Directors of Bihar Grid Company Limited held on Friday, 19th April, 2013, at 11.00 a.m. at Vidyal Bhawan, Bailey Road, Patna-800001, through online audio video media.

88.2.8 'In-principle' Approval for upgradation of loading capacity of 33kV Bays at Shekhopur Sami, Narhat, Bhusaule GIS Substations of BGCL at a cost estimate of Rs.58.50 lakh and 33kV new Bay construction work at Bhusaule, Goradhi and Narhat GIS Substations of BGCL at a cost estimate of Rs.263.14 lakh as per the request of BSPTCL.

"Resolved that as per the request of BSPTCL, and in order to ensure reliable power evacuation and enhanced system stability, in-principle approval of the Board be and is hereby accorded to the upgradation of loading capacity of 33kV Bays at Shekhopur Sami, Narhat, Bhusaule GIS Substations of BGCL at a cost estimate of Rs. 58.50 lakh only, to be booked under the O&M expenditure of the Company.

"Resolved further that as per the request of BSPTCL, and subject to the approval of BERC and / or other statutory permissions, if any, in-principle approval of the Board be and is hereby accorded to the 33kV new Bay construction work at Bhusaule, Goradhi and Narhat GIS Substations of BGCL at a cost estimate of Rs.263.14 lakh only, and a Petition be put up before the Hon'ble BERC for approval of the same as non Project of the Company with a debt-equity ratio of 75:25."

"Resolved further that the Managing Director or the Director (Projects) of the Company be and is hereby severally authorised to do all such acts and deeds and sign and execute all the required documents and to take all further steps to give effect to the resolution."

Certified True Copy
For Bihar Grid Company Limited

(Jointly with Company Limited)

(Niketa Sinha)
Company Secretary

Niketa Sinha
Company Secretary

Sy-150/10761
19/04/13

Tentative Cost Estimate for 35KV Bay Upgradation & Bay Extension work at various Substation of BGC.								
Package No. Bay upgradation work								
S. No.	Item Description	Unit	Qty/Bay	Total Bay	Total Qty.	Unit Price (Rs.)	Total Amount (Rs.)	Remarks
1	CT (CR 5000/500/35)	no.	3	3	18	85100	1531800	Bay upgradation consider for 1. 5. Sanku-02 nos. 2. Markut-02 nos. 3. Bhuvnala-02 nos.
2	CABLE (240 Sq. mm)	km	3.8	3	11.4	1751962	2007250	
3	TERMINATION KIT for 800 Sq. mm Cable	no.	6	3	18	5000	90000	
4	Hardware & Fixings (for CT, Cable, Lugs etc.)	lt	1	3	3	100000	300000	
5	Miscellaneous expenses	lt	1	3	3	100000	300000	
Total (including GST)							2461750	
Package No. New Bay construction								
S. No.	Item Description	Unit	Qty/Bay	Total Bay	Total Qty.	Unit Price (Rs.)	Total Amount (Rs.)	Remarks
1	Supply and erection, Testing & Commissioning of Bay of 35KV (252MM, 252A One-bay 252 extension) present at BGS side as per BOM and scope matrix (Supply + ETC, except Civil activities.) 1 Set = 2 nos. Poles	Set	1	1	1	1640000	1640000	Bay Extension consider for 1. Guraah-02 nos. 2. Neelhar-02 nos. 3. Bhuvnala-02 nos.
2	LINE ISOLATION	set	1	1	1	185100	185100	
3	LS	no.	3	1	3	25100	75300	
4	Truss (T)	set	1	1	1	120000	120000	
5	Beam 100	set	1	1	1	121500	121500	
6	CABLE (400 Sq. mm)	km	0.4	1	0.4	1743962	697585	
7	TERMINATION KIT for 800 Sq. mm Cable	no.	1	1	1	5000	5000	
8	Hardware & Fixings (for CT, Cable, Lugs etc.)	lt	1	1	1	100000	100000	
9	Civil work	lt	1	1	1	1000000	1000000	
10	Service charges	lt	1	1	1	200000	200000	
11	Miscellaneous expenses	lt	1	1	1	500000	500000	
Total (including GST)							26854100	
Total tentative cost (including GST 18%)							33681158	

NOTE:

1. Above Rates are taken from 56-09 project work, offer received from party and recent BOC (LOR, Sa, above estimates are tentative. Final cost will be finalized during finalisation of DPR.

35/01/2024

Annexure-VI



Bihar Grid Company Limited **(BGCL)**

Detailed Project Report (DPR) **Approval of the Govt. and estimates**

Name of the Work –

“Supply and Installation of 325 KW Roof Top Solar Power System at 11 nos. GIS
Substation of BGCL”

बिहार ग्रिड कम्पनी लिमिटेड

(संयुक्त उद्योग बिहार स्टेट पावर (होल्डिंग) को. लि. एवं पावरग्रिड)

BIHAR GRID COMPANY LIMITED

(Joint Venture of Bihar State Power (Holding) Co. Ltd. & POWERGRID)



बिहार ग्रिड

द्वितीय तल, अखंडर प्लेस, स्प्रिंग रोड, पटना-800 001, दूरभाष : 0613-2530477 (सर्कलर)

2nd Floor Akash Place, Spring Road, Patna-800 001, Tel : 0613-2530477 (CR), E-mail : bihargrid@gmail.com

CIN : L46100BIR2013PL0019723

Ref : JAPT/SG/Compas/DM-Extracts-III

Extracts of the Minutes of the 56th meeting of the Board of Directors of Bihar Grid Company Limited held on Friday, 10th April, 2024, at 11.00 a.m. at Mahatma Bhawan, Bailey Road, Patna-800001, through online audio video mode.

CS.2.7 To approve the cost estimate for the Supply and installation of 329KW Roof Top Solar Power System at 11 nos. GIS Substations of BGCL on Open Tender Basis at Rs.1.73 Crore including GST and F&I.

"Resolved that in order to reduce recurring expenditure on power and to promote usage of sustainable energy, approval of the Board be and is hereby accorded to the supply and installation of 329KW Roof Top Solar Power System at 11 nos. GIS Substations of the Company on Open Tender Basis, at a cost estimate of Rs.1.73 Crore including GST and F&I, and not incurring for supply, erection and commissioning of the above procurement, and the expenditure be booked under O&M expenditure of the Company."

"Resolved further that the Managing Director or the Director (Projects) of the Company be and is hereby severally authorized to do all such acts and deeds and sign and execute all the required documents and to take all further steps to give effect to the resolution."

Certified True Copy
For Bihar Grid Company Limited

For Bihar Grid Company Limited

(Signature)
(Niketa Sinha) Niketa Sinha
Company Secretary Company Secretary

(Signature)
Sd/-
34/4

