

Ref No:RA/II/002/17-18/1633

21st September 2017

To
Secretary
West Bengal Electricity Regulatory Commission
FD - 415A, Poura Bhawan, 3rd Floor
Sector - III, Bidhan Nagar
Kolkata - 700 106

Sub :Petition seeking 'in-principle clearance' from the Hon'ble West Bengal Electricity Regulatory Commission (WBERC) regarding CAPEX for Implementation of SCADA system at IPCL's Distribution Area covering 220/33kV J K Nagar and its 9 nos. 33/11kV Downstream Substations under 2.8.4.1. of the West Bengal Electricity Regulatory Commission (Terms and Conditions of Tariff) (Amendment) Regulations,2013

Respected Sir,

We are hereby submitting a petition in 2 copies (One Original One Photocopy) ,along with cheque no. 000265 dated 12th September '2017 drawn on RBL Bank, for a sum of Rs 100000/- (One Lac only) towards payment of fees as per Serial no. 6 of Schedule-1 of WBERC(Fees) Regulations, 2013.

One copy of CD is enclosed herewith.

Kindly acknowledge the receipt of the same.

In case of any further clarification required by the Hon'ble Commission,we are ready to provide the same.

Thanking You.

Yours Sincerely

For India Power Corporation Limited

Debasish Das
Debasish Das
Vice President-Regulatory Affairs



Debasish Das
21/9/17
1710h.

Encl.: As Above

India Power Corporation Limited

(Formerly DPSC Limited)

CIN - L40105WB1919PLC003263

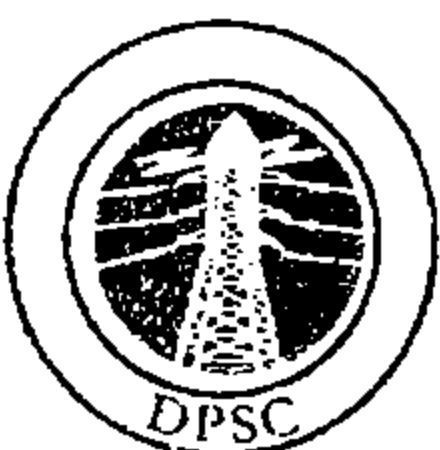
Registered Office : Plot No. X1 - 2 & 3, Block - EP, Sector - V, Salt Lake City, Kolkata - 700091

Ph : +91 33 6609 4300 / 08 / 09 / 10 , Fax : +91 33 2357 2452

Central Office : Sanctoria, P.O. - Dishergarh, District - Burdwan, Pin - 713333 (W.B.)

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E-mail : pr@indiapower.com, Web : www.indiapower.com





FORM-1

(See Regulation 2.5.1)

BEFORE THE HON'BLE WEST BENGAL ELECTRICITY REGULATORY COMMISSION, KOLKATA

File No.

Case No.

(To be filled by the Office)

IN THE MATTER OF:

Petition seeking 'in-principle clearance' from the Hon'ble West Bengal Electricity Regulatory Commission (WBERC) regarding CAPEX for Implementation of SCADA system at IPCL's Distribution Area covering 220/33kV J K Nagar and its 9 nos. 33/11kV Downstream Substations under 2.8.4.1. of the West Bengal Electricity Regulatory Commission (Terms and Conditions of Tariff) (Amendment) Regulations, 2013 and in line with clause 5.4.2 of IEGC GRID Code Regulations, 2010, National Electricity Policy, Clause 4.1.3 of WBERC (State Electricity Grid Code) Regulations, 2007 and CERC Order dated 31/12/2015

AND

IN THE MATTER OF:

India Power Corporation Limited
Corporate Office: Plot No: X-1,2 &3,
Block -EP, Sector-V, Salt Lake City,
Kolkata:700 091



B. N. SAHA
NOTARY
Bikash Bhavan
North Block, Gr. Floor
Bidhannagar, Kolkata
West Bengal



20 SEP 2017



FORM-2
(See Regulation 2.6.1)

BEFORE THE HON'BLE WEST BENGAL ELECTRICITY REGULATORY COMMISSION, KOLKATA

File No.

Case No.

(To be filled by the Office)

IN THE MATTER OF:


Petition seeking 'in-principle clearance' from the Hon'ble West Bengal Electricity Regulatory Commission (WBERC) regarding CAPEX for implementation of SCADA system at IPCL's Distribution Area covering 220/33kV J K Nagar and its 9 nos. 33/11kV Downstream Substations under 2.8.4.1. of the West Bengal Electricity Regulatory Commission (Terms and Conditions of Tariff) (Amendment) Regulations, 2013 and in line with clause 5.4.2 of IEGC GRID Code Regulations, 2010, National Electricity Policy, Clause 4.1.3 of WBERC (State Electricity Grid Code) Regulations, 2007 and CERC Order dated 31/12/2015

AND

IN THE MATTER OF:

India Power Corporation Limited
Corporate Office: Plot No: X-1,2 &3,
Block -EP, Sector-V, Salt Lake City,
Kolkata:700 091




B. N. SAHA
NOTARY
Bikash Ghavan
North Block, Gr. Floor
Bidhannagar, Kolkata
West Bengal



20 SEP 2017

भारतीय गैर न्यायिक

पचास
रुपये

50

भारत

FIFTY
RUPEES

Rs.50

सत्यमेव जयते

INDIA

INDIA NON JUDICIAL



পশ্চিমবঙ্গ পশ্চিম বঙ্গাল WEST BENGAL

BEFORE THE NOTARY PUBLIC

AFFIDAVIT

V 489401

I, Debasish Das, son of Late Dharendra Chandra Das, aged about 49 years, having office at India Power Corporation Limited, Plot No. X1- 2 & 3, Block EP, Sector V, Salt Lake city, Kolkata-700091 do solemnly affirm and say as follows:-

- I am the Vice President (Regulatory Affairs) of India Power Corporation Limited, the petitioner in the above matter and am duly authorized by the said petitioner to make this affidavit for and on behalf of the petitioner.
- That the submissions made in the petition herein now shown to me are true to my knowledge and based on information received and are true to my belief and nothing material has been concealed from the submissions so made or documents or supporting data etc, attached.

Solemnly affirmed at Kolkata on the 20th day of September, 2017 that the contents of this affidavit are true to my knowledge, no part of it is false or nothing material has been concealed there from and misleading material included therein.

Debasish Das
Deponent

Place: Kolkata

Date: 20th September, 2017

B. N. SAHA
NOTARY
Bikash Bhavan
North Block, Gr. Floor
Bidhannagar, Kolkata
West Bengal

Solemnly Affirmed
&
Declared Before me
on Identification of Deponent

B. N. SAHA
NOTARY



Identified by me

Advocate

20 SEP 2017

PETITIONER'S SUBMISSION BEFORE THE HON'BLE COMMISSION

THE PETITIONER, INDIA POWER CORPORATION LIMITED (IPCL) RESPECTFULLY SUBMITS THAT:

The present petition is filed by India Power Corporation Limited under the provisions of following Regulation:-

"2.8.4.1. of the West Bengal Electricity Regulatory Commission (Terms and Conditions of Tariff) (Amendment) Regulations, 2013—relating to prior investment approval of the Hon'ble Commission in respect of transmission/distribution project exceeding the limit as specified under the said Regulation."

A. BACK GROUND OF THE PETITION

1. The Petitioner is a distribution licensee since 1919 engaged in the generation and distribution of electricity over a 618 sq.km. area in the Asansol-Raniganj belt in the State of West Bengal. It was started initially as a venture to meet the electricity requirements of the collieries. Gradually it grew in size to cater to the growing demand for power in the Asansol –Raniganj industrial belt from other HT and LT segments.
2. By virtue of its continual and systematic investment made in strengthening and augmenting its distribution capacity for present and future consumers, the Petitioner has been able to position itself as a provider of most efficient and reliable supplier of power in its license area.
3. The Petitioner is taking Open Access power in 220kV at JK Nagar Substation through the State Transmission Grid and in 33kV at Luchipur 33/11kV Substation through DVC grid. The Power thus procured is economic but any deviation in drawl quantity from that of the scheduled quantity will lead to penalties. The power drawl is regulated by monitoring and operating the network to transfer or shed some loads to avoid over drawl or under drawl which is penalised on Frequency basis.
4. Presently, this monitoring is carried out manually based on telephonic instructions only. This often takes time in increasing Feeder Down time and the deviations in power drawl sometimes exceed the set thresholds and attracts penalty. The need is for Open Source of Power Purchase, Increase in Operational Efficiency and Increasing Customer Satisfaction which may be overcome by automation.



PETITIONER'S SUBMISSION BEFORE THE HON'BLE COMMISSION

5. The Petitioner also submits that automated operation control system is essential as per Memo no SLDC/HOW/18/3818 dated 21.03.2016 as deliberated in 119th OCC meeting held at ERPC (Kolkata) on 18.03.2016 in line with the Hon'ble CERC's order dated 31.12.2015.
6. In compliance of the above letter and to overcome the difficulty, the Petitioner has proposed to install SCADA system in its T&D Network of Asansol in phased manner.
7. The Petitioner humbly submits that it has planned to carry out the infrastructural development in the said areas in two Phases:

Phase-I: Implementation of SCADA at J K Nagar 220/33kV S/Stn. & to make the following 33/11kV Substations SCADA compliant as per priority-

- Establishment of Master Control Centre for SCADA at 220/33kV J K Nagar Substation.
- Making both 33 & 11kV systems of Feeder Road, Ikrah, Dhasal, Gopalpur, Mangalpur 33/11kV S/Stn. SCADA compliant.
- Making 33kV system at Luchipur Substation SCADA compliant for DVC Open Access Power in 33kV.
- Establishing Communication between these 33/11kV Substations with Master Control Centre at JK Nagar.
- Establishing of Communication of J K Nagar Master Control Centre with Central office & Head Office for continuous Real Time Monitoring of online Data with provision of Monitoring stations.
- Establishment of Data & Voice communication between J K Nagar & DVC SLDC at Howrah for DVC Open Access Power drawl at Luchipur.
- Implementation of SCADA software, its configuration at above substations and integration with existing SAS at JK Nagar Substation.
- Data Integration in standard protocol for data monitoring & logging of all of the above Substations.
- 3 Years AMC for SCADA & Communication system.
- Training to IPCL Engineers at Works & at Site.
- Construction of 2nd Floor of Control Building at J K Nagar for installation of Master Control Centre with SCADA system.

Phase-II: To make following 33/11kV Substations SCADA compliant.

- Making 11kV system at Luchipur Substation SCADA compliant.
- Making both 33 & 11kV at Dishergarh, Satgram & Seebpur Substations SCADA compliant.
- Implementation of SCADA software and its configuration at above substations.



PETITIONER'S SUBMISSION BEFORE THE HON'BLE COMMISSION

- Data Integration in standard protocol for data monitoring & logging of all of the above Substations.
 - Establishing Communication between these 33/11kV Substations with Master Control Centre at JK Nagar.
 - 3 Years AMC for SCADA & Communication system.
8. In order to undertake the aforesaid capital investments, the Petitioner seeks 'in-principle clearance' from the Hon'ble Commission.

B. REASONS BEHIND PLANNING FOR AFORESAID CAPEX

9. The general objective of the Petitioner behind such a CAPEX plan is to minimise deviation in power drawl, abnormal load conditions and to achieve operation automation. Petitioner also tries to comply with following provisions of state or national level policies which emphasise on implementation of such facility implementation in Distribution Licensee premises to maintain GRID stability:

As per Clause 5.4.12 of National Electricity Policy which is reproduced as below, a distribution licensee should make effort to implement SCADA system for improving quality and robustness of distribution network.

"SCADA and data management systems are useful for efficient working of Distribution Systems. A time bound programme for implementation of SCADA and data management system should be obtained from Distribution Licensees and approved by the SERCs keeping in view the techno economic considerations. Efforts should be made to install substation automation equipment in a phased manner."

As per Clause 5.4.2 (c) of Indian Electricity Grid Code Regulations, 2010 which reproduced as below, SLDC through respective Distribution Licensee shall try to implement demand management schemes through various automatic demand & load management schemes.

"The SLDC through respective State Electricity Boards/Distribution Licensees shall also formulate and implement state-of-the-art demand management schemes for automatic demand management like rotational load shedding, demand response (which may include lower tariff for interruptible loads) etc., within six month from the date of taking effect of this IEGC, to reduce overdrawl in order to comply para 5.4.2 (a) and (c). A Report detailing the scheme and periodic reports on progress of



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implementation of the schemes shall be sent to the Central Commission by the concerned SLDC...."

As per Operation Policy as stated in Clause 4.1.3 of West Bengal Electricity Regulatory Commission (State Electricity Grid Code) Regulations, 2007 which is reproduced as below, a distribution licensee shall implement at least one ALDC in its premises to monitor GRID operations and coordinate with the SLDC

"4.1.3 Such Distribution Licensee shall establish at least one ALDC to monitor grid operation of its distribution system and to make coordination with the SLDC..."

10. It is a well known fact that Burdwan district is one of the most industrialized zone of West Bengal. The Petitioner by virtue of its 98 years of experience of providing reliable, economic and quality power supply to the critical infrastructure and consumer base in the Asansol – Raniganj belt of Burdwan district now seeks to be a preferred partner in the development of this region.
11. The traditional industrial base of the region supported by coal, iron and steel has undergone a rapid diversification and new industrial ventures which include mainly heavy engineering, fertilizers and coal-based chemicals, is in the process of being set up and along with the availability of water from River Damodar, the Petitioner feels that there is a need to have a complementing electricity infrastructure to facilitate development.
12. The Installation of SCADA is essential in principle since the Petitioner is one of the most efficient power distribution licensees with T&D loss of around 3%. The following have been the basis of the decision of installation of SCADA:
 - a) The deviation in power drawl has to be minimised and brought under the threshold to avoid any penalties on under and over drawl. This will result in savings.
 - b) The Monitoring of power flow in real time will enable in time load transfers thus reducing abnormal loading conditions.
 - c) The operation automation will lead to reduced down time in case of system breakdowns and thus will result in increased sales.
 - d) Provision to comply with direction given by CERC in its Order dated 31/12/2015 in the matter of Non-compliance of Regulation 5.4.2 (d) of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 which is reproduced as below for reference

"However, considering the request of the respondents to grant time to implement ADMS, we grant time till 31.6.2016 to the respondents to implement ADMS, failing which they will be liable for action under Section 142 of the Act for noncompliance of the Regulation 5.4.2 (d) of the Grid Code and order of the Commission. RLDCs are directed to submit the report in this regard by 31.8.2016...."



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which they will be liable for action under Section 142 of the Act for noncompliance of the Regulation 5.4.2 (d) of the Grid Code and order of the Commission. RLDCs are directed to submit the report in this regard by 31.8.2016...."

C. PROJECT HIGHLIGHTS

13. The Petitioner humbly submits before the Hon'ble Commission a snapshot of the CAPEX envisaged :

Phase I & II: Implementation of SCADA system at IPCL's Distribution Area covering 220/33kV J K Nagar and its 9 nos. 33/11kV Downstream Substations

- a) Location of the Project : J K Nagar 220/33 KV s/stn and 9 other 33/11 kV downstream substations of IPCL, Asansol-Raniganj Belt, West Bengal
- b) Capital Expenditure : INR 14.33 Crores including Taxes & Duties
- c) Commissioning Schedule : 12 months

D. GROUNDS OF THE PETITION

14. As the demand of power supply is increasing day by day, reinforcement of transmission and distribution capacity by way of planning for new substations and network has become the need of time. And to improve overall efficiency of power system by optimizing, controlling and supervising, SCADA system needs to be implemented.
15. After implementation of SCADA, operations will be carried out within minimum possible time and with far more accuracy. It will help to identify the faults much quicker and in a more proactive manner, which will ultimately enhance the customer satisfaction by improvement in system reliability & increase supply availability to consumers –thereby reducing losses.
16. The Petitioner humbly submits that based on the last 12 months tripping data, the expected increase in sale units per annum after installation of SCADA at mentioned sub stations, may be approximately. 2.93 MUs. Expected rise in revenue generation may be INR. 0.35 Crores. and additional advantages of INR. 2.66 Crores per annum which may be achieved through efficient power purchase. Thus expected annual saving will be around INR. 3.01 Crores and such investment will finally lead to following advantages:



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- a) Improvement in Supply availability.
- b) Improvement in Feeder Reliability Indices- SAIFI, SAIDI, CAIDI.
- c) Competitive edge over other parallel licensees in our area, as our reaction time to resolve any Consumer issue can be much faster than other players in the same field due to SCADA, which will help us do preventive and proactive monitoring and make us move from reactive to pro-active Customer support services.
- d) Help monitor the complete network system on a real-time basis, from HO & Central Office as per need.
- e) Ensure Regulatory Compliance.
- f) It will help reduce the power purchase cost by almost additional 50 paisa/unit in 220kV.
- g) It will help power drawl when Deviation Settlement Charges are Zero, thereby further adding to additional benefits to the company on power purchase cost.
- h) Penal charges that are otherwise eroding the advantages of lower cost of power purchase can be eliminated thereby adding them to our advantages.
- i) Reduction in Value of lost load by facilitation of more stable electricity supply after implementing SCADA system.
- j) Optimisation of Distribution Network.

17. The Petitioner's plan to undertake such CAPEX is with an aim to be ready with an efficient, resilient and sustainable infrastructure development to fulfil its universal service obligation under Section 43 of the Electricity Act 2003 for providing supply to the villages and industries alike with proactive network monitoring on real time basis.

18. Under Regulation 2.8.4.1. of the West Bengal Electricity Regulatory Commission (Terms and Conditions of Tariff) (Amendment) Regulations, 2013, a Licensee or a generating company may undertake capital expenditure in small schemes, which do not fall within the capital expenditure program approved by the Commission in pursuance of regulations 2.8.1.4 , 2.8.2.3 and 2.8.3, provided the aggregate expenditure on such schemes does not exceed Rs.300 Crores or 5% of gross fixed assets of the generation business of the generating company or distribution business of the distribution licensee or transmission business of the transmission licensee, whichever is lower during the concerned year, subject to the following conditions:-

- i. No approval is required to be taken for Capital Expenditure for the schemes other than those mentioned in Sl. No. (iii) below, in a year up to Rs.300 Crores or 5% of



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gross fixed assets of the concerned business of the concerned business whichever is lower as mentioned above.

- ii. For providing service connection by a distribution licensee to the applicant for new connection the capital expenditure incurred for network development from and beyond distribution substation as defined in SOP will not require any prior investment approval.
 - iii. If the Capital Expenditure, other than those mentioned in Sl.No.(ii) exceeds 300 Crores or 5% of the gross fixed assets of the concerned business whichever is lower as mentioned above, prior approval is required to be taken for Capital Expenditure for such small schemes and which are undertaken beyond the above limit prior to incurring such expenditure.
19. As per audited accounts of the Petitioner, the total gross fixed assets of the license business as on 31st March 2016 are Rs. 458 Crores. Therefore, 5% of gross fixed assets is Rs. 23 Crores. Two investment proposals worth Rs 310.33 Crores is already submitted for "in-principle clearance" before the Hon'ble Commission. Therefore, the consolidated investment proposals submitted before the Hon'ble Commission for approval during the FY17-18 including Rs 14.33 Crores for this SCADA Project, is to the tune of Rs 324.66 Crores, which is higher than 5% of gross fixed assets of the licensed business; the Petitioner has preferred to file this Petition for in-principle investment approval by the Hon'ble Commission.

20. The Petitioner has prepared the Detailed Project Report (DPR) by in-house team. The break-up of the estimated project cost as per the said DPR is indicated below:

Sr.No.	Particulars	Cost (Rs. Crore)
1	SCADA Phase-I	6.94
2	SCADA Phase-II	5.61
3	Taxes & Duties	0.81
4	J K Nagar 2 nd Floor Control Room for SCADA	0.97
5	Total Cost	14.33*

*Exclusive of GST Charges.

Petitioner hereby submit that the proposed estimated project cost i.e. Rs.14.33 does not include impact of GST Charge. It is also stated that GST will be charged as applicable.

21. The Petitioner is hereby submitting the DPR as **Annexure-I** for kind perusal of the Hon'ble Commission.



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E. PRAYERS BEFORE THE HON'BLE COMMISSION

22. In view of the above facts and circumstances, the Petitioner prays the Hon'ble Commission may be pleased to:

- a. Admit the Petition as submitted herewith;
- b. Grant 'in-principle clearance' in terms of Regulation 2.8.4.1.of the West Bengal Electricity Regulatory Commission (Terms and Conditions of Tariff) (Amendment) Regulations,2013;
- c. Allow the Petitioner to file such additional information, explanation and documents as may be required under the guidelines of the Hon'ble Commission;
- d. Allow any other relief, order or direction, which the Hon'ble Commission deems fit to be issued;
- e. Condone any inadvertent errors / inconsistencies / omissions / rounding off differences, etc. as may be there in the Petition.



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ANNEXURE TO THE PETITION

Annexure-I	Detailed Project Report for Implementation of SCADA system at Asansol Distribution Area covering 220/33kV J K Nagar and its 9 nos. 33/11kV Downstream Substations
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WEST BENGAL ELECTRICITY REGULATORY COMMISSION

POURA BHAVAN (3RD FLOOR), FD-415A, SECTOR-III
BIDHANNAGAR, KOLAKTA-700 091

73

Book No. **05**

Date 22.09.2017

RECEIPT

From IPCh
Rs. 1,00,000 = 00 (Rupees One lakh only) only
of Fees for other Application No. 262/17-18 regarding
for implementation of SCADA System.
Cheque / draft No. 000265 dated 12.09.17

Certified that the receipt of the money has been duly recorded in the cash book.

Bank
Source Road
700001

Aswaha
Signature
A. B. E. R.

June, 2017

Detailed Project Report

Implementation of SCADA at Asansol T&D System

India Power Corporation Ltd.

Plot No. X- 1, 2 & 3. Block- EP

Sector -V, Salt Lake City, Kolkata – 700 091



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India Power Corporation Ltd.



*Detailed Project Report for
Implementation of SCADA at Asansol T&D System*


<u>Annexure</u>	
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Annexure - B:	Project Schedule_Phase-I
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CONFIDENTIAL

This Detailed Project Report (DPR) contains proprietary and confidential information of M/s India Power Corporation Ltd. (IPCL) having its registered office situated at Plot No. X-1, 2 & 3. Block – EP, Sector-V, Salt Lake City, Kolkata – 700 091. This document should be treated as confidential and must not be reproduced, copied, loaned or disposed of directly or indirectly, nor be used for any purpose other than that for which it is specifically furnished, without prior written consent of IPCL.



India Power Corporation Ltd.  Adding Power To Life	<i>Detailed Project Report for Implementation of SCADA at Asansol T&D System</i>
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EXECUTIVE SUMMARY

Name of the company	:	India Power Corporation Ltd.		
Constitution	:	Public Limited Company (Closely held) Listed at NSE, CSE & MSEI		
Date of Incorporation	:	July 2, 1919		
CIN	:	L40105WB1919PLC003263		
Directors	:	Name	Position	PAN
		Mr. Hemant Kanoria	Chairman	AKSPK3708R
		Mr. Sunil Kanoria	Non-executive Director	AFTPK7014E
		Mr. Debi Prasad Patra - <i>Retired IAS</i>	Non-executive Director	AGCPP3380Q
		Mr. Amit Kiran Deb - <i>Retired IAS & Ex-chief Secretary of Govt of WB</i>	Non-executive Independent Director	AFOPD8770P
		Mr. Jyoti Kumar Poddar	Non-executive Independent Director	AIAPP6206D
		Mr. Nand Gopal Khaitan - <i>Sr Partner in Khaitan & Co</i>	Non-executive Independent Director	AFLPK3827K
		Mr. Tantra Narayan Thakur - <i>Ex. CMD of PTC and PFC</i>	Non-executive Independent Director	AAAPT2207Q
		Mr. Raghav Raj Kanoria	Managing Director	BDDPK2091Q
		Mr. Asok Kumar Goswami	Whole-time Director	ADOPG8910A
		Mr. Sundareshan Sthanunathan - <i>Retd. IAS</i>	Non executive Independent Director	ABHPS3714K
		Smt. Dipali Khanna	Non executive Independent Director	ADBPK0704H
Registered Office	:	Plot No. X1-2 & 3, Block – EP, Sector – V, Salt Lake City, Kolkata – 700 091		
Activities	:	<ul style="list-style-type: none"> ➤ Generation and distribution of power in the Asansol-Raniganj Coal belt area in the district of Paschim Bardhaman spreading over a licensed area of 618 sq kms. ➤ Generating green energy (wind) basis with aggregate capacity of 105.2 MW spread in four states of Rajasthan, Gujarat, Maharashtra and Karnataka and is also operating the country's 		



	<p>first ever Grid connected solar plant of 2 MW in West Bengal.</p> <ul style="list-style-type: none"> ➤ Franchise business of power distribution in Gaya, Bodhgaya and Manpur districts in Bihar spreading over an area of 1500 sq. kms. through one of its 100% subsidiary. ➤ Setting up a 450 MW (3x150 MW) coal based thermal power plant at Haldia, Dist. Purba Medinipur, West Bengal through one of its subsidiary. 								
Works/Sub-stations	<p>: <u>Generation unit:</u> Dishergarh, Po. Sanctoria, Dist. Burdwan, WB (713 333)</p> <p><u>Receiving sub-stations (principal):</u></p> <ul style="list-style-type: none"> ➤ 220/33 kV J K Nagar ➤ 33/11 kV Feeder Road ➤ 33/11 kV Ikhra ➤ 33/11 kV Dhasal ➤ 33/11 kV Gopalpur ➤ 33/11 kV Mangalpur ➤ 33/11 kV Dishergarh ➤ 33/11 kV Satgram ➤ 33/11 kV Seebpore ➤ 33/11 kV Luchipur ➤ 33/11 kV Sen-Raleigh ➤ 33/11 kV Bankola <p><i>Besides above, the company has many electrical Sub-stations and Switching stations with the help of which it maintains its distribution operations.</i></p> <p><u>Wind Mills:</u></p> <table border="1" data-bbox="654 1451 1452 1624"> <thead> <tr> <th>State</th> <th>Places</th> </tr> </thead> <tbody> <tr> <td>Rajasthan</td> <td>Bakhrani and Sipla in Dist. Jaisalmer</td> </tr> <tr> <td>Gujarat</td> <td>Vadali, Umralla & Methan, Samana, Rajkot & Jamnagar</td> </tr> <tr> <td>Karnataka</td> <td>Chitradurga</td> </tr> </tbody> </table> <p><u>Franchise Business - Project Office</u> 1st & 2nd Floor, Zion Complex (Near Fire Brigade) Swarajpuri Road, Gaya - 823001 (Bihar)</p> <p><u>Coal Based TPP of 450 MW - Project Office</u> Vill. Kashbere, PO. Shibramnagar Haldia, Purba Medinipur (721 635), WB</p>	State	Places	Rajasthan	Bakhrani and Sipla in Dist. Jaisalmer	Gujarat	Vadali, Umralla & Methan, Samana, Rajkot & Jamnagar	Karnataka	Chitradurga
State	Places								
Rajasthan	Bakhrani and Sipla in Dist. Jaisalmer								
Gujarat	Vadali, Umralla & Methan, Samana, Rajkot & Jamnagar								
Karnataka	Chitradurga								
Present Capacities	: <u>Distribution of Power as Licensee:</u>								

		<p>IPCL's present distribution capacity is about 250 MVA with a mix of own generation of 12 MW (5%) and also purchase of power from DVC (33%),WBSEDCL (4%) and IEX/OA mode (57%).</p> <p>Wind Power: Wind Power generation capacity aggregates to 105.2 MW (60 MW at Rajasthan, 29.8 MW in Gujarat, 5 MW at Maharashtra and 10.4 MW at Karnataka).</p>
Customers	:	<p>Distribution of Power: Providing essential power to underground coal mines of ECL, ESI Hospital, Municipality, Indian Railways, Bharat Coking Coal Ltd., Public Water Works, Public Health Enterprise, Television Stations, Technical Institutions, Residential complexes, etc.</p> <p>Wind Power: The company is selling green power under PPAs executed with the respective State discoms viz. Bangalore Electricity Company in Karnataka, Gujarat Urja Vitaran Nigam Ltd. in Gujarat, Ajmer Vidyut Vitaran Nigam Ltd. and Jaipur Vidyut Vitaran Nigam Limited in Rajasthan and Maharashtra State Electricity Distribution Company Limited in Maharashtra.</p> <p>Distribution Franchise Business More than 1,80,000 consumer base comprising of urban and rural areas covering an area of around 1500 Sq. kms.</p>
New Project	:	Implementation of SCADA (Supervisory Control & Data Acquisition) System for T&D System of License Area at Asansol
Existing Bankers	:	Multiple Banking Arrangement with IDBI Bank Ltd, The South Indian Bank Ltd, Axis Bank Ltd and The RBL Bank Ltd.
External Rating	:	<ul style="list-style-type: none"> The company has been rated with CARE A for LT loans/NCDs and CARE A2+ for ST credit facilities from Banks and FIs. Brickwork Ratings (BWR) has also assigned rating of BWR AA- for the specific purpose of raising NCD of upto Rs. 300 crore.
Certification	:	The company is ISO-9001-2008 certified entity.
Website	:	www.indiapower.com



Financials

Particulars	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
	Audited	Audited	Audited	Audited	Audited	Audited
Power sale (MU)	998.48	1142.06	1167.83	1029.11	936.96	810.09
Total Revenue	544.44	654.51	696.39	628.43	587.37	432.17
PBIDT	35.13	72.38	94.16	96.25	103.27	138.09
PBT	17.39	42.46	44.88	36.61	44.22	61.25
PAT	11.80	27.58	29.24	24.18	33.32	38.08
Cash Accruals	18.12	38.54	43.81	39.24	51.28	55.93
TNW	126.68	976.38	1004.51	1030.68	1080.24	1119.87
TTL/TNW	2.03	0.38	0.47	0.55	0.73	0.57
TOL/TNW	3.01	0.53	0.69	0.81	1.07	0.85

Key Operational Flash Points for Operational Area:

- ❖ One of the country's oldest power distribution company with experience of over 97 years.
- ❖ Commands T&D loss parameters of 2.3% as compared to national average of 24%.
- ❖ Reliability index of 99.9% with collection efficiency of 99%.
- ❖ 99% of sales in HT (High Tension) segment facilitating lowest AT&C loss.
- ❖ Command area spread over 618 sq ks with well laid out infrastructure.
- ❖ The only private sector entity in its command area enjoys potential edge over state discoms.
- ❖ Achieved 99% AMR (Automated Meter Reading) in its licensed area reducing the billing time.
- ❖ Enjoys network of smart grid with latest technologies - Pre-paid metering, AMR, GIS etc.
- ❖ Provides critical survival power to underground collieries, public utility services and other Govt. consumers.



1.00 INTRODUCTION

1.01 Background of the Company:

- The Petitioner is a distribution licensee since 1919 engaged in the generation and distribution of electricity over a 618 sq.km. area in the Asansol-Raniganj belt in the State of West Bengal. It was started initially as a venture to meet the electricity requirements of the collieries. Gradually it grew in size to cater to the growing demand for power in the Asansol –Raniganj industrial belt from other HT and LT segments.
- By virtue of its continual and systematic investment made in strengthening and augmenting its distribution capacity for present and future consumers, the Petitioner has been able to position itself as a provider of most efficient and reliable supplier of power in its license area.
- Petitioner was successfully connected to State/National Grid through West Bengal State Electricity Transmission Company Limited by commissioning of 220 kV J.K. Nagar Substation in December 2015. Since then purchasing of power is also being done daily through Indian Energy Exchange (IEX), which steadily reduces our cumulative power purchase cost.
- India Power Corporation Ltd. (IPCL) has over the years optimized Generation, Transmission & Distribution of power in West Bengal, where, it has been supplying power to HT Consumers including Underground Mines, Railways, various process Industries, Commercial premises, LT Consumers as per their demand considering feasibility in supplying Reliable and Cost Effective power to them. Over the years, the T&D loss of IPCL has come down in the range of 2.3% to 3.3% against national average of around 25% because of its extremely efficient distribution network by implementing state-of-the-art technologies like Pre-Paid metering, AMR etc. and also manages an embedded power generating station thus ensuring minimal downtime with an assurance of Supply Reliability Index at 99.97% to 99.99%.
- IPCL is also the Distribution Franchisee for Gaya, Bodhgaya and Manpur regions in the State of Bihar since June 2014, where it is managing more than 1.5 Lac Consumers spread across an area of 1630 sq. Km, which includes rural areas. IPCL had taken over

the area from a State run power utility with the stated objective of improving the technical and commercial status of the distribution network.

- Within a span of 3 year of Service of IPCL, Feeder availability has improved from an average of 12 hours a day to an average of 23.5 hours a day and the Aggregate Technical and Commercial (AT&C) losses has improved from around 75% to around 50%, along with substantial improvement in Voltage profile & Customer Services in its Distribution Franchisee area.
- With a combination of expertise in the electricity distribution business as well as state-of-the-art technology, IPCL has e created world class infrastructure in its License area and are doing so at a rapid pace in the Franchisee areas.
- IPCL also owns and operates several power generation plants within the country, which includes a mix of coal based thermal power plants, wind energy power plants and solar power plants.
- In the thermal generation space, IPCL has a total portfolio of 1462 MW, out of which 312 MW is operational, 450 MW is getting commissioned within this financial year (FY 17-18) and 700 MW would be commissioned the next fiscal (FY 18-19). The generation projects in IPCL's portfolio are:
 - 12 MW Dishergarh Power Plant in Asansol, West Bengal – embedded in IPCL's distribution network to provide distribution network stability
 - 450 MW (3 x 150 MW) Thermal Power Plant in Haldia, West Bengal
 - 1000 MW (2x 150 MW + 2x 350 MW) Thermal Power Plant in Nellore, Andhra Pradesh
- IPCL has also entered into a Joint venture with M/s Uniper, Germany to provide flexible and customized solutions including plant maintenance and operations, asset monitoring software, flexibilisation of units, lifecycle extension and pollution control systems.
- In addition to the above, IPCL has more than 130 MW of operational wind generation assets spread across the country and a 2 MW grid connected solar PV power plant at Asansol.

1.02 Board of Directors

The Board of Directors of IPCL as on June 30, 2017 are as follows:-



Board of Directors: IPCL

Name	Current position	Address	Date of Birth	DIN	PAN	Date of Joining
Mr. Hemant Kanoria	Non-Executive Chairman	Kanoria House , 3 Middle Road, Hastings, Kolkata-700022	05/08/1962	00193015	AKSPK3708R	29/01/2010
Mr. Sunil Kanoria	Non-Executive Director	Kanoria House , 3 Middle Road, Hastings, Kolkata-700022	04/05/1965	00421564	AFTPK7014E	05/02/2010
Mr. Raghav Raj Kanoria	Managing Director	32Q, New Road, Alipore, Kolkata-700027	24/06/1990	07296482	BDDPK2091Q	01/06/2017
Mr. Asok Kumar Goswami	Whole-Time Director	B/35, Jalvayuvihar Co. Op. Hsg. Soc, L/B, Block, Sector-III, Salt Lake, Kolkata-700098	05/05/1947	03331661	ADOPG8910A	15/09/2014
Mr. Debi Prasad Patra	Non Executive Independent Director	Block-CJ-332, Sector-II, Salt Lake City, Kolkata-700091	07/10/1955	00067269	AGCPP3380Q	29/01/2010
Mr. Amit Kiran Deb	Non Executive Independent Director	Block- DA-38, Sector-I, Salt Lake City, Kolkata-700064	26/12/1948	02107792	AFOPD8770P	05/02/2010
Mr. Jyoti Kumar Poddar	Non Executive Director	16/S, Block A, New Alipore, Kolkata-700053	08/11/1961	00690650	AIAPP6206D	29/01/2010
Mr. Nand Gopal Khaitan	Non Executive Independent Director	3, Queens Park, Kolkata-700019	21/05/1951	00020588	AFLPK3827K	29/01/2010

Mr. Tantra Narayan Thakur	Non Executive Independent Director	B- 1/46, 2nd floor Safdarjung Enclave, New Delhi-110029	01/06/1949	00024322	AAAPT2207Q	27/05/2013
Mr. Sundareshan Sthanunathan	Non Executive Independent Director	136, Block D, Second Floor, Defence Colony New Delhi:110024	28/10/1952	01675195	ABHPS3714K	13/10/2014
Dipali Khanna	Independent Director	B2/2079 Vasant Kunj, New Delhi-110070	23/10/1952	03395440	ADBPK0704H	31/03/2015

Brief Profiles of the Directors of IPCL are as under:

Mr. Hemant Kanoria, Non-Executive Chairman

Mr. Hemant Kanoria has over 34 years of experience in industry, trade and financial service. Presently, he is an Honorary Board Member of the Centre for Global Dialogue & Co-operation (CGDC), Vienna and a Council Member of Indo-German Chamber of Commerce. He has previously held the position of Chairman of FICCI National Committee on Infrastructure.

Mr. Sunil Kanoria, Non Executive Director

Mr. Sunil Kanoria has over 26 years of experience in the financial services industry. Presently he is the Senior Vice President of ASSOCHAM, a governing council member of Construction Industry Development Council (CIDC) and a council member of the Institute of Chartered Accountants of India (ICAI), nominated by the Government of India.

Mr. Raghav Raj Kanoria, Managing Director

Shri Raghav Raj Kanoria holds a Bachelors Degree in Commerce with experience in Power and Finance Industry. He is presently the Chairman of Infrastructure Committee of Indian Chamber of Commerce, Chairperson of East & North East Regional Council of The Indo-Canadian Business Chamber, Member of Task Force - Electricity Distribution, Government of Rajasthan and Managing Committee Member of Bengal Chamber of Commerce.

Mr. Asok Kumar Goswami, Whole-Time Director

Mr. Goswami is a Chartered Engineer and has 40 years of experience in India and abroad. He has worked at senior positions in Indian and multinational companies. He has earlier worked as Commissioned Officer in Indian Air Force. He has attended Technical and Management course at Air Force Technical College at Bangalore and Commanders Course at Air Force Administrative College at Coimbatore. He is a recipient of Commendation from Air Officer Commanding in Chief for excellence of service.

Mr. Debi Prasad Patra, Non Executive Independent Director

Shri Debi Prasad Patra IAS (Retd.) holds a Master Degree in Political Science from Delhi University. Mr. Prasad had a distinguished period spanning 24 years in Government wherein he had held several key portfolios including the post of Under Secretary-Home Department, District Magistrate of Darjeeling and South 24 Parganas, Director of Industries, Managing Director-West Bengal Industrial Development Corporation and Secretary, Information Technology.

Mr. Amit Kiran Deb, Non Executive Independent Director

Mr. Amit Kiran Deb had joined the Indian Administrative Service (IAS) in 1971 in the West Bengal Cadre. Mr. Deb served the Government in various crucial departments and handled several portfolios, including assignments like the DM- Darjeeling and Midnapore, Commissioner-cum-Secretary- Education and Social Welfare Dept., Government of Tripura and Joint Secretary, Department of Electronics. He represented Government of India in GAT negotiations in services in Geneva. Later, he held several key positions in Government of West Bengal like Special Secretary- Power, Principal Secretary- Information and Cultural Affairs, Principal Secretary to Chief Minister, Home Secretary and superannuated as Chief Secretary, Government of WB.

Mr. Jyoti Kumar Poddar, Non Executive Independent Director

Mr. Jyoti Kumar Poddar is a commerce graduate having rich experience of 25 years as an industrialist with interests in multifarious sectors like tea gardens, real estate and power. Sri Poddar has handled the entire Indian & Sri Lankan operations in solar business for Shell Solar Limited, Netherland and is actively involved towards contributing to the green energy mission of the country by way of setting up solar photovoltaic cell manufacturing unit and other power projects in India.



Mr. Nand Gopal Khaitan, Non Executive Independent Director

Mr. Khaitan has passed his Attorney ship Examination from the Calcutta High Court in the year 1974 and was awarded Bell Chamber's Gold Medal by the Incorporated Law Society, High Court, Calcutta. Mr. Khaitan is the President of Indian Council of Arbitration, New Delhi. He is also an Executive Committee member of the Federation of Indian Chambers of Commerce and Industry, New Delhi and Vice President of Bharat Chamber of Commerce.

Mr. Tantra Narayan Thakur, Non Executive Independent Director

Mr. Thakur has more than 40 years of extensive experience in the fields of treasury management, financial management including resource mobilization, investment decisions and appraisal of project lending and has led the Board of several renowned companies including being the Chairman and Managing Director of PTC India Limited, PTC India Financial Services Limited and also Chairman of the Board of PTC Energy Limited, Director (Finance and Financial Operations) Power Finance Corporation Limited. He also served the Government of India in various leadership roles.

Mr. Sundareshan Sthanunathan, Non Executive Independent Director

Mr. Sundareshan Sthanunathan has more than 35 years of experience in various capacities from State and Government of India. He had served at various position like Secretary - Ministry of Heavy Industries, Ministry of Petroleum and Gas, Principal Secretary (Revenue), Government of India, Joint Secretary - Dept. of Economic Affairs, MOF, Joint Chief Controller of Ministry of Commerce and Managing Director - Kerala Fisheries Corporation, to name a few.

Smt. Dipali Khanna, Independent Director

Smt. Dipali Khanna is a MA (History) from Delhi University, M.Sc. (National Security) from National Defence College and has also completed a Certificate Course (Cost & Management Accountancy) from Institute of Cost & Works Accountants. Smt. Khanna, a former officer of the Indian Railway Accounts Service (1976 batch) had worked as the CEO of the Indira Gandhi National Centre of Arts (IGNCA), New Delhi. Prior to her joining the IGNCA, Smt. Khanna worked in various capacities in the realm of Finance Administration during her years of the civil service. She has worked as Additional Secretary and Financial Advisor for various Ministries, including the Ministry of Information & Broadcasting, Ministry of Culture/Tourism, Ministry of Law & Justice, National Disaster Management Authority, Ministry of Defence, Railway Board and Ministry of Power. She has also served actively on the boards of four large Public Sector Undertakings (PSUs) under the Ministry of

Defence (HAL, MDL, GRSE & GSL), two PSUs under the Ministry of Power (NEEPCO & THDC), one PSU each under Ministry of Tourism (ITDC) and Ministry of Information & Broadcasting (NFDC).

1.03 Key Management Personnel

The Key Management Personnel of IPCL as on March 31, 2017 are as follows:-

Mr. Shrirang Bhalchandra Karandikar, CEO

Mr. Shrirang Karandikar is M. E. in Electrical and PG Diploma in Project Management. He possesses multidimensional experience in business operations & development, project management, start-up operations and leadership & team management in various Power Sector Utilities for over more than 3 decades. Started his career with MSEB and sailed through organizations like Kalpataru Power, Torrent Power, NDPL (Tata Power), NTPC etc. In his last stint with Crompton Greaves Limited, he made remarkable contribution in acquiring franchise businesses while heading the distribution business. He brings with him a sound knowledge of both acquisition and implementation of start-up operations with exposure to managing processes & procedures and compliance & quality.

Mr. Sushil Agarwal, CFO

Mr. Sushil is a qualified Chartered Accountant and also has completed PGDM (Executive) from IIM Lucknow. He carries vast and rich experience of 25 years and has worked in some of the leading multinationals and Indian conglomerates like Reliance Infrastructure (BSES Yamuna Power Ltd. and BSES Rajdhani), Havells India Ltd., Arcelor Mittal, Olam International, JK Tyre and L&T Limited. Immediately before joining us, he was with Hindustan Power Group as Sr. VP (F & A) and CFO for MB Power. His core competencies are in the areas of Financial Management, Finance & Accounts processes, Fund Raising, Strategic Business Planning, Mapping and Reengineering of Processes, Enterprise Risk Management and auditing.

Mr. Sanjeev Seth, President-Power Distribution

Mr. Seth is a BE in Electronics and brings with himself rich experience of close to three decades. He has worked in some of the leading multinationals and Indian conglomerates like Reliance Infrastructure (BSES Yamuna Power Ltd.), Ferromatik Milacron, Usha Telehoist and ECE Industries. His core competencies are in the areas of Strategic Management, Top & Bottom line growth, Business Development, Relationship Management and People Management. He has been

instrumental in establishing, handling and turning around Power Distribution business in his previous stint.

Mr. Somesh Dasgupta, President-Corporate Affairs

Mr. Somesh Dasgupta is a B.E (Mech), M.I.E from Institute of Engineers & PGDBM from IIT (Kharagpur). He possesses vast experience of over three decades in Human Resource Management and Personnel Management. He has expertise in various HR Consulting, formulation and implementation of Quality Circles, concept of Total Quality Management and revised Policy structure. He was National Vice President of National Institute of Personnel Management (NIPM), National Council and was also the Chairman of NIPM, Kolkata Chapter. He is also the Chairperson of Human Resources, Industrial Relations & Productivity Council/Employer Federation of India (ER).

Mr. Debashis Sarkar, Vice President-Technical

Mr. Debashis Sarkar is a B.E (Electrical). He has a rich experience of about 25 years in areas of operation, erection and commissioning, quality assurance and maintenance operations in power generation and distribution sector. He has hands on experience of handling both HT & LT distribution network by managing large team of technical hands. His earlier association was with CESC and Ranchi Power Distribution (P) Co. Limited (RP Sanjiv Goenka Group) and Torrent Power Limited.

Mr. Sandip Mitra, Vice President Regulatory Affairs & Budget

Mr. Sandip Mitra is a B.Com (Hons), ACA, ACS, AICWA. He has around 29 years' of experience in accounts, finance, taxation, costing, MIS, budget, legal and commercial matter and statutory and internal audit. He has handled various portfolios as GM-Finance, Manager Accounts, Manager-Finance, Manager-Tax, Manager-Internal Audit and Consultant in various industries like oil, automotive and industrial segment, power T&D, electricity regulatory commissions in India etc.

Mr. Prabhajit Sarkar, Vice President-Strategic Business Initiative

Mr. Prabhajit Sarkar is a B.E (Mech.), PGDM. He heads Business Development wing of IPCL. He has varied experience in power sector including development of power markets in the country, conducting business analysis across various verticals and subsidiaries for enhancing operational efficiency. He has a rich experience of working in various organizations like Power Exchange of



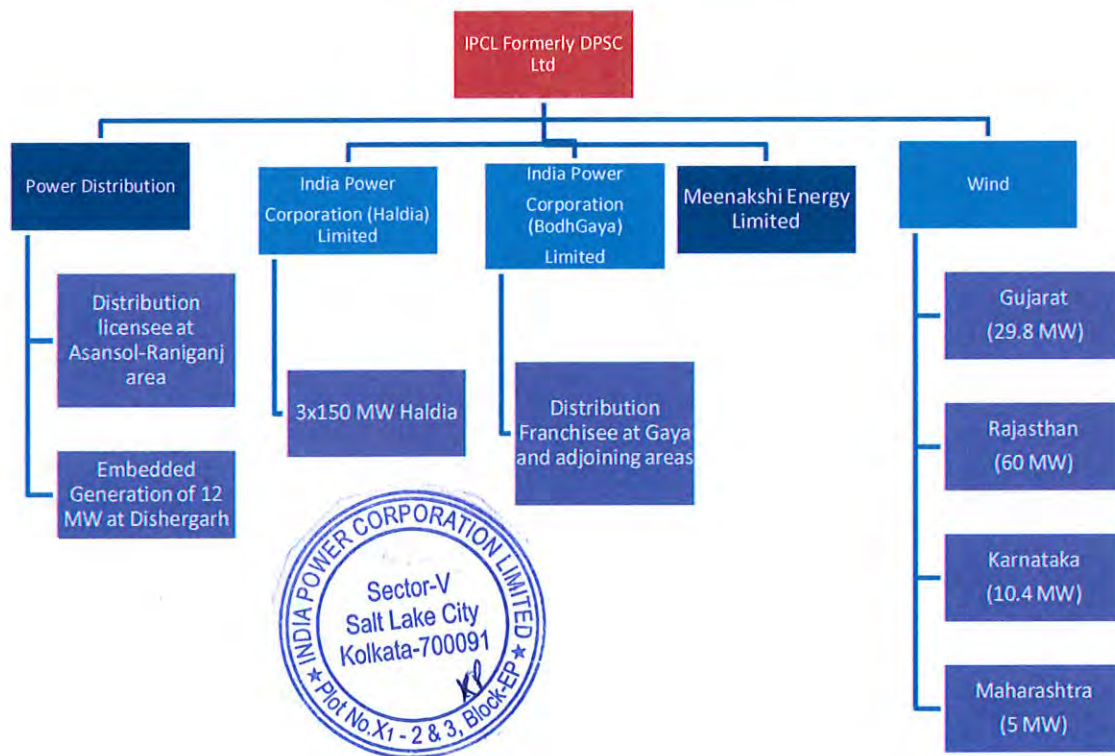
India Limited, Larsen & Toubro and Power Trading Corporation of India Limited before joining IPCL.

Mr. Prashant Kapoor, Vice President–Secretarial & Compliance

Mr. Prashant Kapoor, ACS, has an experience of over 17 years in areas of compliance of listing Agreements with the stock exchanges, corporate governance, meetings of board & its committees, preparation for IPO etc. He also has legal experience in joint venture agreements, sale deeds, SLAs, master service agreement with governments, MOUs with banks, credit appraisal and several other matters.

1.04 Associate companies of IPCL:

Figure 1: IPCL Holding Structure



IPCL, through its 100% subsidiary has undertaken Distribution Franchise Business for supplying power in Gaya, Bodhgaya and surrounding areas in Bihar. The very objective of DF mode of business is to reduce the AT&C losses in the system and bring in operational efficiency in the

network. Therefore opportunity for the franchisee is to quickly reduce the Aggregate Technical and Commercial (AT&C) losses by improving the billing and realization from the consumers and system strengthening. This will not only allow the company to grow by using its expertise in bringing down the AT&C losses but also facilitates in adding up to its top line and bottom line. The DF business was taken over w.e.f. 1st June, 2014 for a term of 15 years.

The total area under company's operation is spread over 1500 sq kms with present consumer base of over 1,80,000. The company is buying power from South Bihar Power Distribution Company Ltd (Licensee) at various input points at bid rate and is distributing the same to its consumers and is also responsible for collection of bills which is made at regulated tariff fixed by the State Electricity Regulatory Commission.

Major developments/improvements in the DF business after taken over by IPCL are as under:

- T&D loss brought down to around 50% as compared to 75% at the time of take-over;
- Collection efficiency improved to nearly 100% from a meager 35% at the time of take-over;
- Over 40000 new meters installed since inception, as such meter reading efficiency increased to 60% from 23% at the time of take-over;
- Towards improving the consumer service and redressal of grievances/complaints 24x7 customer care centres, 24x7 Outage Management Crew and 126 Collection centres have been constituted.

1.05 Other associate companies of IPCL are as under:

- **IPCL Power Trading Pvt. Ltd**, is a SPV of IPCL incorporated for undertaking trading of power. The company has received Category-III Trading License from Central Electricity Regulatory Commission (CERC) for inter-state trading of power. This empowers them to trade up to 500 MU (with an upper margin of 20% more) on Pan India basis. Presently IPTPL will focus on Bilateral OTC market to match up the surplus-deficit gap across different regions of India including exploring the possibility in inter country selling.
- **India Power Corporation (Bihar) Pvt. Ltd.** Which was incorporated on 13th January, 2011

with the Registrar of Companies, West Bengal with an object of foraying into setting up power projects at an opportune time to beef up its overall power generation.

- **IPCL Pte. Ltd.**, has been floated as wholly owned foreign subsidiary of IPCL. The registered office of the company is situated at 30 Cecil Street, #19-08, Prudential Tower, Singapore – 049712. The principle objective of the company is to own, operate and maintain power generation and related activities internationally.
- **India Power Green Energy Utility Private Limited-** A wholly owned subsidiary of the company established to develop/acquire green assets to build a sizable portfolio of green energy.
- **India Power Corporation (Haldia) Limited-** A subsidiary of the company setting up 450 (3x150) MW coal based power station at Haldia, The project has achieved the financial closure with REC and PFC being the project lenders. The project is progressing well and is expected for commercial operation soon.



2.00 PROJECT OBJECTIVE:

At present, IPCL is taking Open Access Power in 220kV at our J.K.Nagar substation from State Transmission Grid and in 33kV at our Luchipur 33/11kV Substation from DVC. The Power procured is economic but any deviation in our drawl quantity from that of the scheduled quantity will result in penalties. Presently, this process of monitoring is manual based on telephonic instructions only. Lack of effective centralized automation system has become a challenge for efficient load management and that leads to concern for Customer Satisfaction, Revenue protection and Operational Efficiency. This also sometimes leading to increasing Feeder Down time and the deviations in power drawl sometimes exceed the set thresholds and attracts penalty.

These shortcomings can be avoided by providing the electrical utility with tools which will enhance the operational efficiency of the system having real time data from the network. This real time data can then be monitored & used for supervisory control for effective & efficient load management and archiving the data with effective guidance from distribution automation tools under Cyber Security Protection.

Automated operation of control system is essential as per instruction from CE, SLDC, Howrah vide Memo no SLDC/HOW/18/3818 dated 21st March 2016 as deliberated in 119th OCC meeting held at ERPC (Kolkata) on 18th March 2016 in line with the hon'ble CERC's order dated 31st Dec 2015.

To comply with the above, IPCL has proposed to install SCADA system in T&D Network of Asansol in phased manner to achieve the following objectives:

- Establishment of DMS (Distribution Management System):
- Acquisition, Monitoring, Control & Communication of System data to desired locations
- Fault Management & System restoration
- Outage Management- shortage outage time
- Faster decision on Energy Buy- Sale. Monitoring of real time power flow for optimum loading of Network by effective load transfer
- To minimize deviation in our power drawl and to bring under the threshold to avoid any penalties on under and over drawl.
- To reduce down time in case of system breakdowns by Operational automation
- Effective Load scheduling-optimising peak load management by comprehensive Operation planning in advance
- Load Balancing

- Real time power flow analysis-VAR Control through real time intelligent digital network
- Calculation of system parameters like-SAIDI, SAIFI,CAIFI
- Historical Data base with Disturbance & Event recording
- Missing data calculation
- Energy data calculation & quantifying Energy loss
- Provision to comply with the Order from SLDC in March'2016 for implementation of (ADMS) for all state utilities of STU system



3.00 JUSTIFICATION OF THE PROJECT

As per Regulation 5.2 (p) of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 (Grid Code)

Each User, STU and CTU shall provide and maintain adequate and reliable communication facility internally and with other users/STUs /RLDC/SLDC to ensure exchange of data/information necessary to maintain reliability and security of the grid. Wherever possible, redundancy and alternate path shall be maintained for communication along important routes, e.g., SLDC to RLDC.

As per Regulation 5.2 (q) of the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 (Grid Code),

All the users, STU/SLDC and CTU shall send information/data including disturbance recorder/sequential event recorder output etc., to RLDC for purpose of analysis of any grid disturbance/event. No user, STU/ CTU shall block any data/information required by the RLDC and RPC for maintaining reliability and security of the grid and for analysis of an event.

The general objective of the Petitioner behind such a CAPEX plan is to minimise deviation in power drawl, abnormal load conditions and to achieve operation automation.

As per Clause 5.4.12 of National Electricity Policy which is reproduced as below, a distribution licensee should make effort to implement SCADA system for improving quality and robustness of distribution network.

SCADA and data management systems are useful for efficient working of Distribution Systems. A time bound programme for implementation of SCADA and data management system should be obtained from Distribution Licensees and approved by the SERCs keeping in view the techno economic considerations. Efforts should be made to install substation automation equipment in a phased manner.



- Ensures Regulatory Compliance.
- Implementation of SCADA will help operations to be carried out within minimum possible time and with far more accuracy, it will help us identify the faults much quicker and in a more proactive manner, which will ultimately enhance the customer satisfaction by improvement in system reliability & increase Supply Availability to Consumers & reducing losses by optimum loading of network on real time basis.
- Improvement in Feeder Reliability Indices- SAIFI, SAIDI, CAIDI.
- Better competitive edge over competition as our reaction time to resolve any Consumer issue can be much faster than other players in the same field as SCADA will help us do preventive and proactive monitoring and make us move from reactive to pro-active Customer support services.
- Help monitor the complete network system from HO & Central Office as per need on a real-time basis.
- It will help power drawl when Deviation Settlement charges are Zero, this will further add to additional benefits to the company on power purchase cost.
- Penal charges that are otherwise eroding the advantages of lower cost of power purchase can be eliminated thereby adding them to our advantages.
- Optimization of Distribution Network leading to reduced losses and reduction in component failure.
- Based on the last 12 months tripping data, the expected increase in saleable units per annum after installation of SCADA at above mentioned sub stations is approx. 2.93 MUs. Expected rise in revenue generation is INR. 0.35 Crs. and additional advantages of INR. 2.66 Crs per annum which can be achieved through efficient power purchase. Thus expected annual saving is INR. 3.01Cr. A separate sheet is attached herewith for further clarification as per **Annexure-F**.

It is mandatory to measure and monitor the parameters with daily load forecast in accordance with Grid regulation. So, implementation SCADA is essential.



4.00 DESCRIPTION OF THE SYSTEM

- Considering the up gradation of T&D network in the License Area of IPCL at Asansol, it has become a necessity to implement SCADA for proper monitoring & control of various feeders under the entire IPCL network. It provides centralized control with the facility of retrieving & archiving of data for feeders & Transformers and thereby facilitating an effective load management. We have already installed SAS at our 220/33kV J K Nagar substation, which is integrated with SLDC (State Load Despatch Center), Howrah. At present, J K Nagar substation is connected with the downstream 33/11kV substations for feeding load via 33kV overhead lines. In view of that, it is planned to link all the following substations in phases through SCADA for systemized control and effective load management.
- Nevertheless the electric power distribution networks are susceptible to interruptions caused by a variety of reasons such as adverse weather conditions, equipment failure, accidents, etc. The Power Distribution Companies (PDC) normally identify the faulty section of the network and restore the power supply using their own resources which are mostly based on classical methods and techniques. Today the rapid growth of Information Technology (IT) tools has promoted many PDC to bring up to date their fault diagnosis as well as troubleshooting systems. Among new technologies used for this purpose, SCADA systems are considered as the widely appropriate tool used for such processes. SCADA is the acronym for “Supervisory Control and Data Acquisition”. SCADA systems are widely used for supervisory control and data acquisition of diverse kind of processes.
- The implementation of SCADA in the power network automation system will provide better services to Power Distribution Companies customers and improve the power quality and reliability of the electric supply services, which would satisfy the following goals:
 - Respond to customer service interruptions more quickly.
 - More efficiency of the power system by maintaining acceptable power factors and reduced losses.
 - More control and limit of peak power demand. Ability of O&M Engineering staff to monitor and control the power system during normal and abnormal conditions by providing more reliable and appropriate real time data.

5.00 SCOPE OF WORK:

The major scope of work of installation of SCADA is proposed as: Survey, Design-Engineering, Supply, Erection, Testing-Commissioning of SCADA, Communication system & Electrical Equipments, including Cyber Security Protection, Training & 3 years AMC.

Phase-I: Implementation of SCADA at J K Nagar 220/33kV SS & to make following 33/11kV Substations SCADA compliant as per priority-

- Implementation of SCADA & Communication system at Master Control Center at 220/33kV J K Nagar Substation.
- Construction of Master Control Center at J K Nagar.
- Making both 33 & 11kV systems of Feeder Road, Ikrah, Dhasal, Gopalpur, Mangalpur 33/11kV Substations SCADA compliant.
- Establishing Communication between these 33/11kV Substations with Master Control Centre at JK Nagar.
- Establishing of Communication of J K Nagar Master Control Centre with Central office & Head Office for continuous Real Time Monitoring of online Data with provision of Monitoring stations.
- Implementation of SCADA software, its configuration at above substations and integration with existing SAS at JK Nagar Substation.
- Data Integration in standard protocol for data monitoring & logging of all of the above Substations.
- Implementation of Cyber Security Protection system as per CEA Guidelines & arranging 3rd party Audit by CEA authorised Agency.
- 3 Years AMC for SCADA & Communication system.
- Training to IPCL Engineers at Works & at Site.

Phase-II: To make following 33/11kV Substations SCADA compliant.

- Making 11kV system at Luchipur Substation SCADA compliant.
- Making both 33 & 11kV at Dishergarh, Satgram, Luchipur & Seebpur Substations SCADA compliant.
- Implementation of SCADA software and its configuration at above substations.

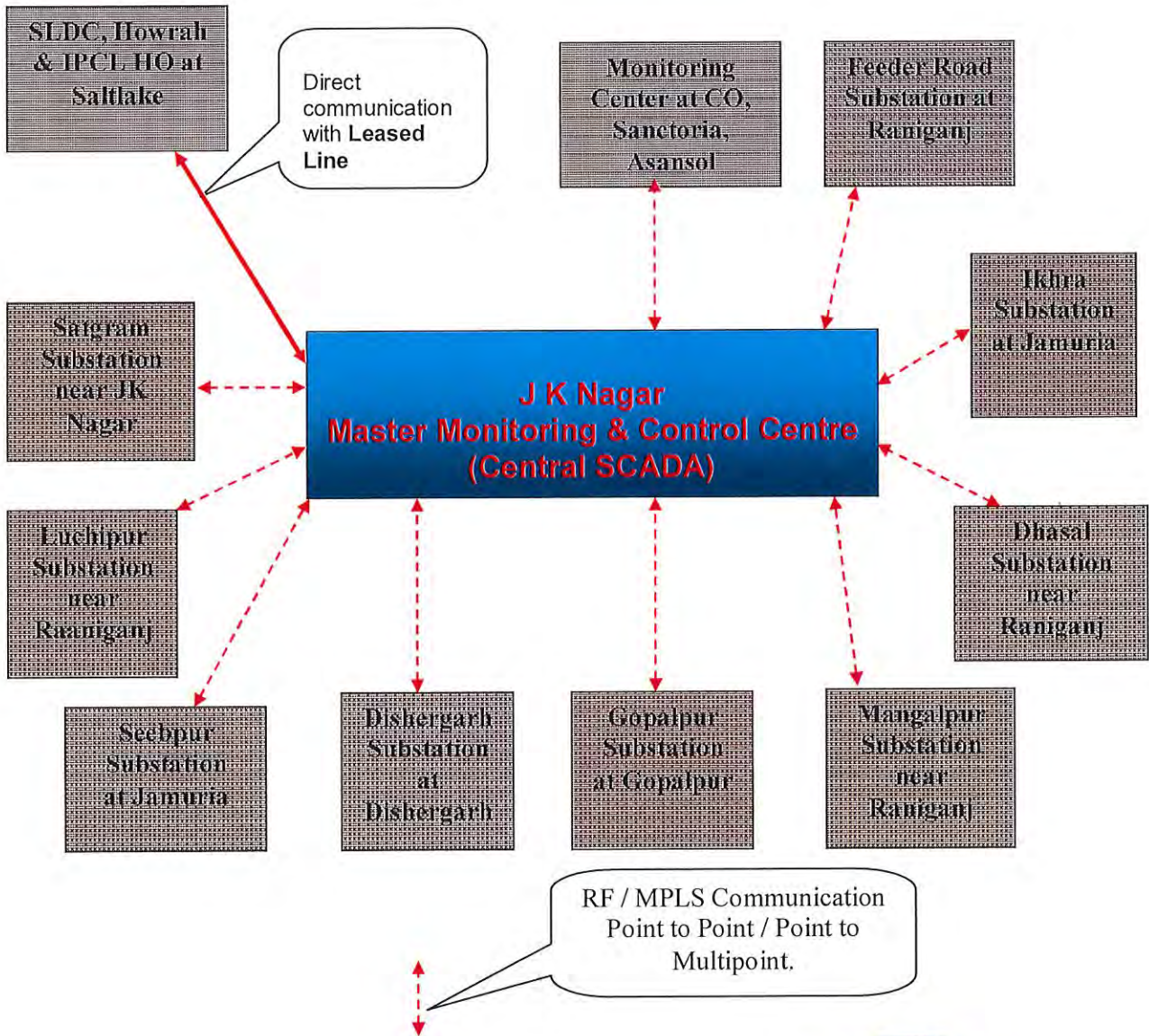


- Data Integration in standard protocol for data monitoring & logging of all of the above Substations.
- Establishing Communication between these 33/11kV Substations with Master Control Centre at JK Nagar.
- Establishment of Data & Voice communication between J K Nagar & DVC SLDC at Howrah for DVC Open Access Power drawl at Luchipur.
- Implementation of Cyber Security Protection system as per CEA Guidelines & arranging 3rd party Audit by CEA authorised Agency.
- 3 Years AMC for SCADA & Communication system.



6.00 BASIC SCHEMATICS OF PROPOSED SCADA:

The detail Architectural Layout of proposed SCADA is in Annexure-A:



7.00 SALIENT FEATURES OF PROPOSED SCADA

The new system shall utilise a SCADA centric architecture for a more responsive, reliable & secure platform with a unified user interface to provide a consistent & holistic view of the network to the operation staffs.

The salient features of the proposed SCADA systems are:

- Real time Data acquisition
- Supervisory control
- Periodic calculations in required format
- Disturbance Data collection
- Switching Order Management
- Outage Information system & Outage Analysis
- Energy Accounting
- Distribution Power Flow
- Optimum Load Shedding on priority
- Historical data archiving
- Distribution Network Modeling
- Cyber Security measures for protecting data from un-authorized use or transfer



8.00 SITE CONDITIONS

The substation equipments shall be designed to suit the following site conditions:

- | | | | |
|----|----------------------------|---|---|
| a) | Substation formation level | : | 103 M above MSL (Mean Sea Level) |
| b) | Civil plinth level | : | 500 mm above formation level |
| c) | Design ambient temperature | : | 50 ^o C (maximum)
5 ^o C (minimum) |
| d) | Relative Humidity | : | 68% (maximum) |
| e) | Seismic Zone | : | III |
| f) | Wind Zone & speed | : | IV & 47 m/sec |



9.00 PROPOSED MAJOR EQUIPMENTS DETAILS

Electrical equipment and system shall be Designed, Constructed, Tested and Installed in accordance with the latest versions of IS, IEEE and/or IEC codes and Standards and shall comply with Indian Electricity Rules, CEA Guidelines and their latest amendments, wherever applicable

9.01 Equipments at SCADA Master Control Centre (MCC), J K Nagar:

- **UPS with Isolation Transformer:** 2 x 20 KVA online UPS will be deployed to power up entire SCADA systems & RF Communication devices at Master Control Centre. UPS will be supplied along with Isolation transformer to serve additional surge protection.
- **Battery Bank:** Sealed Maintenance Free (SMF) battery with Shelf / Rack will be deployed along with UPS for around 2 hrs power back-up.
- **Rack:** Cabinet (L: 600 x D: 1000 x H: 2000 mm) to accommodate all Servers, Firewall, Managed Network Switches etc.
- **Main Server:** It is a rack-mounted unit. It is communicated to RTU over 104-protocol in bi-directional way, acquires data from RTU, manage data and send required commands & time synchronization signal to RTU. It's the heart of the Master Control Centre. The Server is equipped with a KVM Console/ Monitor along with a Keyboard & Mouse for configuring purpose. The servers will be running Red Hat Enterprise Linux Operating System.
- **Stand by Server:** It's the redundant server and takes the entire traffic / load in case of failure of Main Server.
- **Historian Server:** This Server is basically used for achieving of data. Data can be retrieved anytime for analysis purposes. The capacity of Historian server would be 2 TB.
- **Work stations:**
 - **Operator Work station (OWS):** It is basically a HMI with 22 inch TFT monitor along with keyboard and mouse, used for viewing, controlling the SCADA systems.

- **Engineering Work Station (EWS):** It is also a HMI with 22 inch TFT monitor along with keyboard and mouse & will be used for operations and maintenance purposes. Numerical Relay DR software (supplied by relay OEM) can be installed in EWS.
- **Large Video Display (LVDS):** It is a large HD screen of 80 inch 2 x 2 matrix display for viewing entire SCADA networks.
- **Printer:** Printer will be A3 in size for printing Event list / Alarm list etc. **Firewall:** Cisco ASA series router will be deployed as a network firewall to **compliance** cyber security.
- **Network Switches:** Cisco catalyst layer-3 switches will be deployed as network switches.

9.02 Equipments at 33/11kV Substations:

- **Remote Terminal Unit (RTU):** The modular Remote Terminal Units (RTU) are deployed to meet the needs in transmission and distribution automation requirements, i.e. for better energy management system. RTU is communicating on TCP/IP based protocol IEC 60870-5-104. The main components of RTU's are following...
 - (a) Central Processing Unit (CMU)
 - (b) Power Supply Unit (PSU)
 - I Analog Module (AI) to process analog values of bay such as MW, MVAR, AMP, FREQ, VOLTAGE, Transformer winding TAP etc.
 - (d) Digital Module (DI) to process digital indications of bay such as CB, ISO etc.
 - (e) Digital Output Module (DO) to process remote Circuit Breaker operations of bay.
- **GPS Clock:** GPS clock along with external antenna is used for time synchronization of RTU.
- **UPS with Isolation Transformer:** 2 KVA online UPS will be deployed to power up RTU & RF Communication devices at Substation. UPS will be supplied along with Isolation transformer to serve additional surge protection.
- **Battery Bank:** Sealed Maintenance Free (SMF) battery with Shelf/Rack will be deployed along with UPS for around 2 hrs power back-up.

- **IEC 61850 compatible Switch:** All numerical relays & RTU can be integrated through this managed switch and would be reachable to Master Control Centre.
- **RF Communication Equipment:** Substation level data will be reached at Master Control Centre through RF Communication media. The RF communication devices operate on Un-license Band frequency. The main components of RF communication media are,
- **Point-to-Point Antenna:** These are directional antennas, used for data communication between Master Control Centre & Substation end (i.e. remote end) and would be mounted on the communication tower & work under clear LOS.
- **Cluster Management Module (CMM4):** It will be installed at Master control Centre (MCC) to synchronise and manage all connected clusters. CMM4 has features of a high speed L2 switch also.
- **Ground base RF Communication Tower:** These towers are generally used for mounting RF Antennas.
- **Multifunction Energy Meter:** These 3ph-3w Tri-Vector Energy Meters are communicable to remote station via RS485 MODBUS. These meters are also DLMS compliant.
- **Numerical Relay:** These relays are IEC61850 compliant & also can be managed from remote server location. Numerical Relays will be deployed in all 33KV & 11kV feeders & transformers.
- **Circuit Breaker:** These switchgears are VCB type & will be deployed as per schedule in 33 KV & 11 KV voltage level Substations
- **Contact Multiplier Relay:** The potential-free contacts of these relays are used for acquiring digital inputs of feeders/transformers etc. These relays are wired up inside the Relay Control Panel.
- **Command Relay for remote Breaker operation:** Remote Breaker operations can be done through these interposing relays which are placed inside the Relay Control Panel. The relay coils are energized by DC voltage from RTU (DO module) & subsequently Breaker tripping coils are getting tripped via. The potential-free contacts of these relays.

9.03 Equipments at Central Office, Sanctoria & Head Office, Saltlake:

- **HMI Viewing Station:** It is basically a HMI with 40 inch TFT monitor alongwith keyboard and mouse, used for viewing the SCADA systems.
- **Network Switch:** Cisco layer-3 switches will be deployed to integrate the SCADA systems.

9.04 Energy Management System (EMS)

Main features:

The metering system located at various stations or feeders will be interconnected to EMS under the communication scheme as detailed. The software shall be designed in terms of various modules for performing different functionalities real time monitoring application.

The online monitoring software will be provided to suit the requirement of online data transfer from meters and representing that data for effective load monitoring. The software has been designed on client server architecture; hence in future more clients can be connected to the same system.

The salient features of the system to be provided are as follows:

1) **Load Monitoring:** The information available under this module will be as under:

- The load-monitoring module of the offered software provides graphical as well as tabular display of various parameters of the feeders / meters interconnected in this system.
- Readings from each feeder will be continuously collected and plotted against the background.
- Average frequency will be continuously displayed on the screen.
- The readings will be available with elapsed time during the current demand integration period of 15 minutes.
- The graphical screen will present different energy / demand parameters of various feeders in a user-friendly format and same will get updated on a minute-to-minute basis.
- The tabular screen will present following parameters for each feeder with data updation rate of one minute –

- ✓ Average frequency
- ✓ Average Voltage



- ✓ Active Import
- ✓ Active export
- ✓ Reactive Import while active import
- ✓ Reactive Export while active import
- ✓ Reactive Import while active export
- ✓ Reactive Export while active export
- ✓ Reactive High
- ✓ Reactive low
- ✓ Apparent Import
- ✓ Apparent Export

Active, Reactive and Apparent parameters will be available for monitoring in the form of energy as well as demand based on user selection. Additional to the above parameters, on-line monitoring for (Active demand) scheduled, current, predicted and suggested values would also be made available.

- Suitable forms will be provided through the software to user for configuring parameters (energy / demand) to be displayed on the online monitoring screen.
- The shift charge engineer will be able to continuously monitor ex-bus generation for every 15 min. block on real time basis.
- Apart from individual feeder monitoring, the software provides **for monitoring the summated load for a group of meters**. The user shall be able to define the configuration of meters for this summated data under virtual meter definition.
- Alarm conditions of the feeders will be made available on online screen – these alarms are basically the anomaly conditions as logged by the meter like PT miss, CT reversal, voltage unbalance and current unbalance.
- Apart from meter alarms, user defined alarms will also be made available based on limits defined for various parameters. Further, there shall be proper alarm, as “Communication fail” on online screen and values displayed will get changed to red colour as “N.A.” (No Data Available) for the on-line logging parameters in case of communication medium failure.

- 2) **Load Scheduling:** The module shall be used to prepare the schedule for various stations so as to be given to the Central Loan Despatch (CLD). The module when initiated will allow for entering the scheduled data for each 15-minute integration period using a graphical user interface window. The schedule shall be represented in tabular as well as graphical format. Import/ export of schedule can be done via this module in ASCII format. The schedules can be saved and all schedules shall get stored for any further reference by the user.
- 3) **Report Generation:** Unscheduled Interchange (UI) report shall be generated based on the data for the agreed schedule and the actual generation (data as acquired from meters).
- 4) **Historical data:** This module provides for historical data ie. Load survey data (for each 15 minute interval) for various parameters (as configured for meter) as stored by the server. The data as acquired on real time basis gets shifted to historical database on a continuous basis and same is being made available in graphical formats for various energy / demand and frequency parameters. This module will also make available schedule values for each 15 minute interval for virtual meter as defined by user. The data shall be made available in graphical format (daily/weekly/monthly views are available for user selection).
- 5) **Auto Read Utility:** This module will provide for acquiring missed load survey data from meters in case of failure of communication channel for on-line data. This redundant communication medium will be through dial-up modem (as will be put up at metering system end and central station client PC end) on PSTN infrastructure.

Specific features:

In addition to the standard features as specified above, the software will provide for the following features as desired:

Load monitoring modules will provide with the following data –

Feature for demand monitoring for 30 min. DIP will be available in a tabular format with the following data:

- Net concurrent apparent demand (one minute demand & rising demand for 30 minutes)
- Scheduled apparent demand
- Scheduled apparent demand will be entered by user as a single value for a defined period.
- Predicted apparent demand

10.00 LOCATION & INFRASTRUCTURE

10.01 Location

The proposed sub-stations are all adjacent to each other and is near to NH-2 which is connecting Kolkata to Delhi. The area is an industrial zone with presence of many industries like iron & steel, cement, fabrication, etc. The company being one of the oldest power providers in that area has always been in its pursuit to serve its consumers with best possible services in terms of meeting the additional demand of the consumers and also ensuring reliable and quality power supply.

10.02 Construction Power:

The construction power is available within its own system, ensuring prompt and scheduled implementation of the project.

10.03 Construction Water:

The required water shall be drawn from bore-wells. The area has a very comfortable ground water level and the company will not find much problem in sourcing water from bore-wells.

10.04 Manpower:

At present the Company has developed a strong team of comprising technical, commercial, and marketing executives. The Company has good resources of line people consisting of skilled, unskilled, supervisory and managerial staff. The area being industrially developed with existence of other units of DVC, WBSEDCL, WBSETCL & DPL, any additional manpower required for the project will not be any problem for the company.

10.05 Transportation:

All modes of transport facility are available. The site is located with the industrially developed zone of Asansol-Burdwan area of West Bengal and is well connected with roadways, main eastern railway frontier and also has air route connectivity with Bengal Aerropolis at Andal. The NH-2 is also very nearby. With presence of various industries in the area, transportation of machinery, equipments and workforce is not a problem.



11.00 SCHEDULE OF IMPLEMENTATION

11.01 Phase-I: The L1- Schedule is in Annexure-B

Activity	Start	End
Detail Survey, Design –Engineering, BOQ finalisation for Line of Sight Measurement, Electrical Equipments, SCADA Items, Communication Items etc.	July'17	August'17
Order placement & availability of Materials at site in phased manner on priority basis	August'17	November'17
Erection & Testing of Materials at site	September'17	March'18
Commissioning	March'18	March'18

11.02 Phase-II: The L1- Schedule is in Annexure-C

Activity	Start	End
Detail Survey, Design –Engineering, BOQ finalisation for Line of Sight Measurement, Electrical Equipments, SCADA Items, Communication Items etc.	April'18	May'18
Order placement & availability of Materials at site in phased manner on priority basis	May'18	July'18
Erection & Testing of Materials at site	June'18	August'18
Commissioning	August'18	August'18

12.00 RISK & MITIGATION

Any project execution involves a number of risk elements which varies from low to very high level on the scale of project scheduling mechanism. However, the risk mitigation largely depends upon the proven business experience of the Directors, flexible higher Management hierarchy and efficient Team of Technical, Commercial and Financial professionals. Some of the major area of risks involved with the "Project" are as follows:

Sl. No.	Risk	Description / Mitigation	Severity
1	Line of Sight Clearance for RF Communication	<ul style="list-style-type: none"> Line of Sight clearance is very much essential for RF communication. Any hindrance will create disruption in RF link. Prompt and alternate option shall be taken for MPLS connectivity in a cost effective way. Parallel Survey for MPLS feasibility is also taken in advance. 	Moderate
2	Availability of required Shutdown for Feeders for installation of New Circuit Breakers & other Accessories	<ul style="list-style-type: none"> The entire planning of the Project is synchronised with the preventive maintenance plan of the respective Substations / Feeders to maintain Feeder Reliability Index at its level as of now of more than 99%. Changeover of load from one feeder to other to be done during peak / off-peak hours to maintain supply availability. 	Low
3	Necessary clearance from Statutory Authority	<ul style="list-style-type: none"> Getting timely clearance from Statutory Authorities / Agencies for the Project is pivotal. 	Moderate



13.00 CONSENTS & CLEARANCES REQUIRED

A list of statutory consents, approvals and clearances required for the Project are as under:

Sl. No	Details	Agency
1	In-Principle Investment clearance by WBERC	WBERC
2	Substation charging clearance by Chief Electrical Inspector, Govt. of WB for New Electrical Installation (if any)	Chief Electrical Inspector, Govt. Of WB
3	Approval of local Municipality for Building (if any)	Local Municipality
4	Approval from Fire Service Department (if any)	WB Fire Service Department, Asansol, Raniganj
5	Approval from respective Independent Service Provider (ISP) for only MPLS connectivity (if any)	Respective MPLS Service provider



14.00 ESTIMATED COST OF PROJECT & MEANS OF FINANCE

14.01 Cost of Project:

The estimated cost of Project as per the above scope of Work is as under.
 Item wise breakup of Cost is in **Annexure-D**.

<i>Phase</i>	<i>Location of Project / Substation</i>	<i>Est. Cost w/o Taxes (INR Cr.)</i>	<i>Taxes (INR Cr.)</i>	<i>Commissioning Schedule</i>
I	<ul style="list-style-type: none"> As per Scope of Work SCADA Master Control Center with Communication at J K Nagar SCADA & Communication system for 33/11kV Substations at Feeder Road, Ikhra, Dhasal, Mangalpur & Gopalpur 	7.23	0.81	March, 2018
II	<ul style="list-style-type: none"> As per Scope of Work SCADA & Communication system for 33/11kV Substations at Dishergarh, Seebpur, Satgram & Luchipur 	6.29		August, 2018



14.02 Means of Finance:

The cost of project of INR 14.33 Cr. is proposed to be financed as under:

Particulars	INR. Crore
Equity Share Capital/Internal Accruals/Contribution	4.30
Term Loan	10.03
TOTAL	14.33*

*Exclusive of GST Charges. GST will be charged as applicable.



15.00 CONCLUSION

The following are the conclusions from this techno-economic feasibility report:

- The company is one of the oldest power distribution entities of the country having a long business run of over 97 years.
- It commands lowest ever T&D loss parameters of 2.3% as compared to national average of 24%.
- 99% of its sales are towards HT (High Tension) customers mainly in industrial segment ensuring lowest AT&C loss.
- Wide distribution area spread over 618 sq kms with well laid out infrastructure with more than 400 C.KM. of overhead lines and more than 150 C.KM. of underground cable network.
- The company is the only entity operating under private sector in its area of distribution. Being in private sector, it enjoys potential edge over its other government competitors by providing prompt and quality services to its customers
- The collection efficiency is more than 99% and maintains an uptime of 99.9% with the help of well established ring main system.
- Regulated assets with assured minimum ROE of 15.5% on generation and 16.5% on distribution assets provide significant downside protection.
- It has efficient distribution network with state-of-the-art technologies like Pre-Paid metering, AMR, GIS, etc.
- Major customers include ECL, ESI Hospitals, Municipality, Indian Railways, , Public

Water Works, Public Health Enterprise, Television Stations, etc.

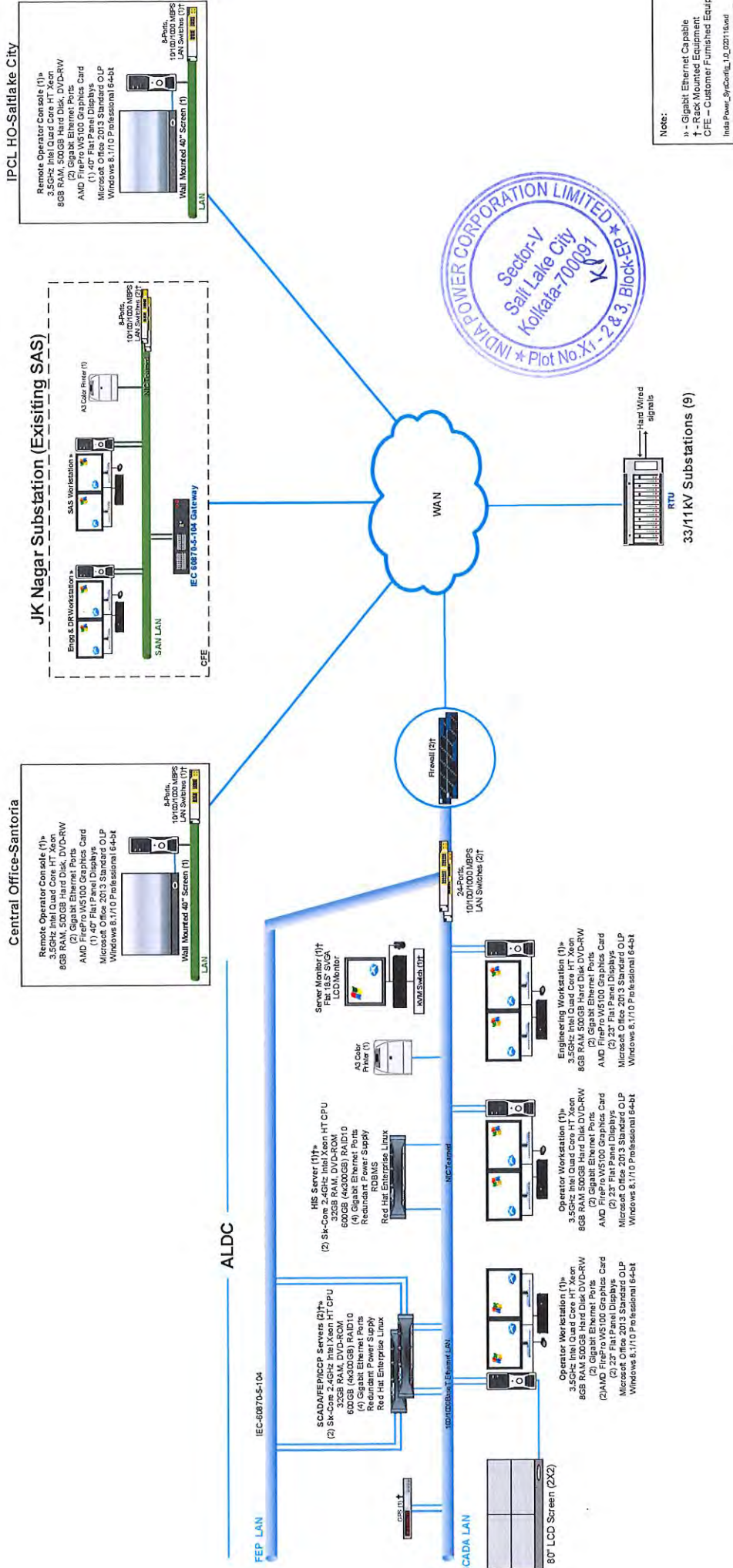
- The company has recently commenced operations of its newly set up 220/33 kV high powered sub-station at J K Nagar, near Asansol which facilitates the company sourcing power at competitive rates from the state grid.
- The company has a highly qualified team with technical and financial knowledge base and an able fleet of service resources.
- Operating in Distribution Franchisee mode of business, the company has further enriched its technical know-how in distribution business by reducing the AT&C loss in Gaya from 79% (at the time of take-over in June, 2014) to nearly 55%.
- The company is having long term credit rating of AA- from Brickwork Ratings and A+ by CARE Ratings, denoting adequate safety in the payment of interest and repayment of term loans. Also the company has been assigned top short term rating of A1+ denoting highest degree of safety in servicing the short term debt obligations.
- The profitability projections indicate that the proposed unit will generate adequate surplus to service the debt and equity.

Based on the foregoing, the proposed project of SCADA has been found to be technically & operationally feasible and economically & commercially viable for supplying Power to its valued Consumer with the best level of performance in the field of QUALITY, REALIABILITY & COST EFFECTIVENESS.



ANNEXURES

IPCL – System Configuration



Note:
 * - Gigabit Ethernet Capable
 † - Rack Mounted Equipment
 CFE - Customer Furnished Equipment
 India Power_Sychof@ilg_1.0_020115.ind

Annexure-B

India Power Corporation Ltd.

Phase-I: Implementation of SCADA in T&D Network system

A) SCADA Master Control Center (MCO) at J.K.Nagar										
B) 33/11kV SS: Feeder Road; Itra; Dhasak; Gopalpur; Mangalpur Monitoring at Central Office, Sanctoria & Head Office, Siltlake										
Sl. No.	Task Description	1	2	3	4	5	6	7	8	9
(A) SITE SURVEY										
1	Civil works for JK Nagar Master Control Centre including Server room, UPS and Battery room & final site clearance from IPCL									
2	Details Site survey/design-engineering/approval from IPCL for installation of RTU / UPS / Battery Bank / ACD/B/DCDB etc. (SS - 5 Nos, JK Nagar MCC, New Central Office, Corporate Office)									
3	Line of Sight (LOS) measurement between 2 Hubs including site survey/design-engineering/approval from IPCL (required for 6 RF links)									
4	Survey and design-engineering of complete SCADA of ALDC and submission of FDS (Functional Design Specification) and to get approval from IPCL.									
5	Survey for design-engineering, drawing, documentation for 33kV & 11kV switchgear/RCP systems to make SCADA compatible, fixing of Multifunction Energy Meters & Numerical Relays-Non-Directional, Directional, Differential, Auxiliary relays, Auxiliary Contact Switches etc. & to get approval from IPCL. - for 5 Nos. Substation									
(B) ORDER PLACEMENT (Based on actual Site Survey/Design/Approval)										
1	RTU consisting of Power Supply, Processor module alongwith DI/DO/AI modules with accessories- for 5 Nos. Substation									
2	UPS / Battery-Bank alongwith accessories - for 5 Nos. Substation									
3	Master Control Centre accessories									
4	RF Communication Equipments- for 5 Nos. Substation									
5	Self-supported/Gyved Inant Tower (based on LOS survey) - for 5 Nos. Substation									
6	Numerical Relays									
7	Multifunction Energy Meter									
(C) INSTALLATION & COMMISSIONING										
1	Installation of SCADA System for individual 5 Nos 33/11kV Substations - for 5 Nos. Substation									
2	Erection & Commissioning of 2 x 20kVA UPS with Battery & Surge Protection for ALDC at JK Nagar MCC									
3	Master Control Centre commissioning at J.K.Nagar									
4	Self-supported/Gyved Inant Tower erection (Wherever required based on site survey) - for 5 Nos. Substation + New Central office (CO)									
5	Establishment of RF Communication Link (6 links)									
6	Fixing/Wiring/Installation of MF Energy meter, Numerical relay in RCP and SCADA wiring- interfacing work between Switchgear/RCP & RTU, Fixing of Aux Relays for DI/DO signal operations inside switchgear panels including laying/demurring/determination of multiair cables at both end - for 5 Nos. Substation									
7	Installation of SCADA System for Remote Monitoring Centre at IPCL, Sanctoria Office, Asanool									
8	Installation of SCADA System for Remote Monitoring Centre at IPCL, Corporate Office (HO), Salt Lake City, Sector-V, Kolkata									
9	Integration of all 5 Nos of 33/11kV Substations, ALDC Master Control Centre of IPCL at 200/33kV J. K. Nagar Sanctoria, SAS and Remote Monitoring Centre at IPCL-Offices at Sanctoria & Kolkata for monitoring & Control - including Testing & Troubleshooting									
** Require power shutdown (station wise) in time, so that work can be done smoothly to maintain the time frame.										



Annexure-C

India Power Corporation Ltd.

Phase-II: Implementation of SCADA in T&D Network system

		April'18	May'18	June'18	July'18	August'18
A) 33/11kV SS: Satgram; Dishergarh; Luchipur; Shibpur						
B) Integration with DVC-SLDC HWH						
SL.N O	TASK DESCRIPTION	1	2	3	4	5
A SITE SURVEY						
1	Details Site survey/design-engineering/approval from IPCL for installation of RTU / UPS / Battery Bank / ACDB/ DCDB etc.-- for 4 Nos. Substation					
2	Line of Sight (LOS) measurement between 2 Hubs including site survey/design-engineering/approval from IPCL (required for 4 RF links)					
3	Survey and design-engineering of complete SCADA of ALDC and submission of FDS (Functional Design Specification) and to get approval from IPCL					
4	Survey for design-engineering, drawing, documentation for 33kV & 11kV switchgear/RCP systems to make SCADA compatible, fixing of Multifunction Energy Meters & Numerical Relays-Non-Directional, Directional, Differential, Auxiliary relays, Auxiliary Contact Switches etc.& to get approval from IPCL -- for 4 Nos. Substation					
B ORDER PLACEMENT (Based on actual Site Survey/esign/Approval)						
1	RTU consisting of Power Supply, Processor module alongwith DI/DO/AI modules with accessories - for 4 Nos. Substation					
2	UPS / Battery+Rack alongwith accessories -- for 4 Nos. Substation					
3	RF Communication Equipments -- for 4 Nos. Substation					
4	Self-supported/Guyed mast Tower (based on LOS survey) -- for 4 Nos. Substation					
5	Electrical Relay Control Panel					
6	Electrical Switchgear for 33 KV & 11 KV bay					
7	Numerical Relays					
8	Multifunction Energy Meter					
C INSTALLATION & COMMISSIONING						
1	Installation of SCADA System for individual 5 Nos 33/11kV Substations --- for 4 Nos. Substation					
2	Self-supported/Guyed mast Tower erection (Wherever required based on site survey) --- for 4 Nos. Substation					
3	Establishment of RF Communication Link --- (4 links)					
4	Fixing/Wiring/Installation of MF Energy meter, Numerical relay in RCP and SCADA wiring- interfacing work between Switchgear/RCP & RTU, fixing of Aux. Relays for DI/DO signals/operations inside switchgear panels including laying, ferruling, termination of multicore cables at both end --- for 4 Nos. Substation					
5	Integration of all 4 Nos of 33/11kV Substations at J. K. Nagar MCC, Remote Monitoring & Control Centre at IPCL-Offices at Sanctoria & Kolkata for monitoring & Control --- Including Testing & Troubleshooting					
** Require power shutdown (station wise) in time, so that work can be done smoothly to maintain the time frame.						



Annexure-D		
Substationwise Break-up of Estimated Cost SCADA sytem Implementation		
Sl No	Job Scope	Estimated Cost (INR CR.)
A	1st Phase	
1	J K Nagar	220/33kV ALDC Master Control Center
2	Feeder Road	33kV & 11kV
3	Ikrah	33kV & 11kV
4	Dhasal	33kV & 11kV
5	Gopalpur	33kV & 11kV
6	Mangalpur	33kV & 11kV
8	Monitoring @ CO	
9	Monitoring @ HO	
10	AMC for SCADA	3 Years
11	AMC for Communication	3 Years
		7.23
B	2nd Phase	
1	Luchipur	33kV & 11kV
2	Dishergarh	33kV & 11kV
3	Satgram	33kV & 11kV
4	Seebpur	33kV & 11kV
5	AMC for SCADA	3 Years
6	AMC for Communication	3 Years
		6.29
C	Taxes & Duties (Ph-I & II) (As per prevailing rate)	0.81
D	3rd Party Audit as per CEA Guideline for compliance to Cyber Security Protection measures	Inclusive
E	Total	14.33

Note: Capital investment for SCADA implementation i.e. Rs. 14.33 Crore is exclusive of GST Charges. GST will be charged as applicable.



West Bengal State Electricity Transmission Company Limited

(A Government of West Bengal Enterprise)

CIN: U40109WB2007SGC113474; Website: www.wbsetcl.in; Phone / Fax No. (033) 2334 9020
Registered Office : Vidyut Bhawan, Block-DJ, Sector-II, Bidhannagar, Kolkata - 700 091



**OFFICE OF THE CHIEF ENGINEER
STATE LOAD DESPATCH CENTRE**

Memo No.: SLDC/How/18/ 3818

Dated: 2/03/2016

To as per distribution list.

**Sub: Implementation of Automatic Demand Management System (ADMS)
(Agenda Item No. B.2 for 119th OCC meeting)**

Dear Sir,

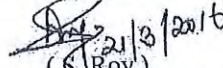
In reference to above, it may please be noted that in line with the deliberation in 119th OCC meeting held at ERPC, Kolkata on 18/03/2016 and as per Hon'ble CERC's order dated 31/12/2015, dead line regarding implementation of ADMS in different state utilities of STU system is 30/06/2016 and failing which utilities will be liable for action under section 142 of the Act.

So, all the utilities in STU system are hereby requested to take immediate necessary action towards implementation of ADMS in respective control areas within CERC's dead line i.e. 30/06/2016.

However C.E (SLDC), DVC informed in the said OCC meeting that they have already implemented ADMS in DVC system and ready to share any information regarding ADMS implementation if required.

Thanking you.

Yours faithfully,


(K. Roy.)
C.E(Ofg.), SLDC, WBSETCL.

Distribution List.:

1. CE, PTP, WBSEDCL
2. DGM (SO), CESC.
3. GM, DPL.
4. VP-Power Purchase, IPCL.



Annexure-F

ROI Calculation for implementation of SCADA at Asansol T&D System

Return on Investment

Details

ROI Return / Capital Investment

Estimated Savings in connection with Tripping	3510000	Rs.
Estimated Savings in connection with UI	26600000	Rs.
Annual Savings	301	Rs. in Lacs
Capital Investment for SCADA implementation	1433.00	Rs. in Lacs
Payback		

ROI (1st Year)

21.01%

Note: Capital investment for SCADA implementation i.e. Rs. 14.33 Crore is exclusive of GST Charges. GST will be charged as applicable.



Implementation of SCADA at Asansol T&D System

Project	
Cost of the project	Rs Lacs 1,433.00
Interest during construction	Rs Lacs 47.02
Total Project Cost	Rs Lacs 1,480.02

Debt Finance	Rs Lacs 1003.10 (Debt Equity Ratio of 70:30 is considered)
Own Infusion	Rs Lacs 429.90 (Debt Equity Ratio of 70:30 is considered)
	Rs Lacs 1433.00

Interest During Construction Period (IDC) 47.02 (IDC to be calculated separately considering the cash outflow and gestation period)

Rate of Interest 12.50%

Total Estimated Annual Savings / Earnings

Rs Lacs	301.10	Year 1
Rs Lacs	301.10	Year 2
Rs Lacs	301.10	Year 3
Rs Lacs	301.10	Year 4
Rs Lacs	301.10	Year 5 onwards



Year	Net Contribution	3.36%	12.50%	2.50%	33.99%	PAT	Gross Cash Flow	Loan Repayment	Net Cash Flow	Cum Cash Flow
		Book Deprn.	Interest	R&W	IT Deprn.	I. Tax				
0							-1480.02	0	-1480.02	-1480.02
1	301.10	49.73	112.85	35.83	102.70	0.00	102.70	200.62	-48.19	-1528.21
2	301.10	48.06	87.77	35.83	129.45	0.00	129.45	200.62	-23.12	-1551.33
3	301.10	46.44	62.69	35.83	156.14	14.34	141.80	200.62	-12.38	-1563.71
4	301.10	44.88	37.62	35.83	182.78	31.04	151.74	200.62	-4.00	-1567.71
5	301.10	43.37	12.54	35.83	209.36	46.52	162.85	200.62	5.60	-1562.11
6	301.10	41.92	0	35.83	223.36	56.69	166.67	0.00	208.59	-1353.52
7	301.10	40.51	0	35.83	224.77	61.71	163.06	0.00	203.57	-1149.95
8	301.10	39.15	0	35.83	226.13	71.17	160.15	0.00	199.30	-950.65
9	301.10	37.83	0	35.83	227.44	60.49	157.84	0.00	195.67	-754.98
10	301.10	36.56	0	35.83	228.71	51.42	156.02	0.00	192.59	-562.40
11	301.10	35.33	0	35.83	229.94	43.71	154.63	0.00	189.96	-372.43
12	301.10	34.15	0	35.83	231.13	37.15	153.59	0.00	187.74	-184.70
13	301.10	33.00	0	35.83	232.28	31.58	152.84	0.00	185.84	1.14
14	301.10	31.89	0	35.83	233.39	26.84	152.34	0.00	184.23	185.38
15	301.10	30.82	0	35.83	234.46	22.82	152.04	0.00	182.86	368.24
16	301.10	29.78	0	35.83	235.49	19.39	151.92	0.00	181.70	549.94
17	301.10	28.78	0	35.83	236.49	16.48	151.93	0.00	180.71	730.65
18	301.10	27.81	0	35.83	237.46	14.01	152.06	0.00	179.87	910.52
19	301.10	26.88	0	35.83	238.39	11.91	152.28	0.00	179.16	1089.68
20	301.10	25.98	0	35.83	239.30	11.10	152.90	0.00	178.88	1268.56
IRR										4.96%

Implementation of SCADA at Asansol T&D System

Name of Project:

Yes
 Bank Loan 1,433.00
 Base Cost 47.02
1480.02
 Total Project Cost

	Yr-1			Yr-2			Total	Yr-1	Yr-2	Total	100%
	Apr-Jun	July-Sep	Oct-Dec	Apr-Jun	July-Sep	Oct-Dec					
Initial Funding:											
Base Cost	0.00	716.50	716.50	0.00	0.00	0.00	1433.00	0.00	0.00	0.00	1433.00
IDC	0.00	15.67	31.35	0.00	0.00	0.00	47.02	0.00	0.00	0.00	47.02
Total Project Cost	0.00	732.17	747.85	0.00	0.00	0.00	1480.02	0.00	0.00	0.00	1480.02
Debt (70%)	0.00	501.55	501.55	0.00	0.00	0.00	1003.10	0.00	0.00	0.00	1003.10
Equity(30%)	0.00	214.95	214.95	0.00	0.00	0.00	429.90	0.00	0.00	0.00	429.90
Total Funds	0.00	716.50	716.50	0.00	0.00	0.00	1433.00	0.00	0.00	0.00	1433.00
Rate of Interest	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%				



Annexure - G

Expected Revenue growth after implementation of SCADA (Considering interruptions for 11kV & 33kV for last 1 year)										
A	No of interruptions as per record for 6 months	Duration in Minutes as per record (p.a.)	Expected Duration after implementation of SCADA (Minutes p.a.)	Annual Reduction in Duration in Minutes	Avg Monthly Power flow in MUS	Per annum Increase in Sale in Mus	Annual Savings in INR (Lacs)	Total Interruptions in Minutes (p.a)	Total Supply Minutes p.a.	Per Minute power flow (Unit)
33/11kV Sub Station										
Dhasal	227	1852	454	1398	3.76	0.124	1.49	16870	508730	88.69
Dishergarh	296	3574	592	2982	5.66	0.406	4.87	26898	498702	136.19
Feeder Road	448	4496	896	3600	6.00	0.526	6.31	32913	492687	146.14
Gopalpur	187	2118	374	1744	4.60	0.190	2.28	18126	507474	108.77
Ikra	112	858	224	634	17.05	0.255	3.05	16012	509588	401.50
Luchipur	238	4686	476	4210	6.93	0.726	8.72	43654	481946	172.55
Mongalpur	46	658	92	566	11.93	0.157	1.88	9472	516128	277.37
Satgram	343	2964	686	2278	8.10	0.444	5.33	27104	498496	194.99
Seebpore	99	1030	198	832	4.98	0.097	1.17	14827	510773	117.00
Grand Total (Savings INR Lacs / annum)										
							35.1			

Assumption: 1) Average Contribution from sale of a unit is considered at INR 1.20 (Sale Price - Purchase Price)

2) Expected av. duration per interruption after SCADA is considered as 1 minute.

Expected Saving in Power Purchase in 220kV after implementation of SCADA					
B	Total Drawl /Month (MU)	Expected UI Drawl Enhancement (MU) /p.m.	Expected Reduction in Power Purchase cost /Unit (INR)	Saving /Month (INR Lacs)	Saving /Annum (INR Lacs)
Direct Cost Optimisation on Energy Rates	37	4.4	0.50	22.20	266.4

Assumption:

On implementation of SCADA, we may draw from UI upto 4.4MU p.m. (12% of total drawl) at a min cheaper rate of INR 0.5 (comparing present rate of INR. 2.61 to target rate of INR. 2.11) enabling us to save approx. INR. 2.66 CR. p.a.



SWOT ANALYSIS

Strengths:

- Established in the year 1919, with rich experience in power sector, especially in T&D sector in the states of West Bengal and Bihar. Established businesses across the value chain, particularly in generation sector with both thermal power plants and renewable energy generation presence in the states of Karnataka, Gujarat, Rajasthan, Maharashtra).
- Expertise in managing a robust distribution network with T & D losses of less than 3%, as against country average of 25%
- Regulated Tariff regime protects downside risks
- The industrial consumers in the licensed area are growing
- Customer Centric Focus -successfully maintaining a customer care cell in all three zonal offices with one centralized cell at Central Office, Sanctoria
- PAT (Profit After Tax) has been increasing steadily
- Striving to maintain & enhance the Sales figure of the company
- Power failure record of IPCL is extremely minimum with reliability index more than 99.96%
- Leveraging on technology through Automatic meter reading facility available at individual consumer premises
- Own generation capacity (at Haldia) will strengthen the ability to negotiate power price.

Weaknesses:

- Dependence on availability of cheap power for long term to be tied up- for which long term PPAs would be entered to ensure adequate availability of power at competitive prices.
- Regulations do not permit supernormal profit to take advantage of power shortage

Opportunities:

- There is a potential in this sector for increased power demand. The continuous increase in power demand as a key driver of increasing economic growth in the country , provides a perfect opportunity for the company to leverage its experience and key learning's in ramping up capacity across the power value chain. India Power



Corporation Ltd (IPCL) is an established organization and can leverage on its capabilities to meet industry requirements.

- IPCL is in the process of its capacity expansion to meet power demand in West Bengal and in other states.
- Returns/ share prices of IPCL has been increasing, which is a very good sign from the investor's perspective.
- IPCL is in the process of expanding its licensed business in other areas leading to unlocking value and growth.

Threats:

- The issue of land acquisition for setting up industry for private promoters. Right of Way issue has been a major factor for delaying the Transmission Project throughout the Country. The company is an established name in the region and does not foresee any major problems.
- Overall economic recession, globally & nationally- however signs of economic growth and revival is evident.
- Other big power generating companies with large capacity have started to penetrate the power market already, leading to stiff competition but with a proven track record of serving its consumers with quality power, the company has an added advantage over competition.
- Stiff tariff competition on account of multiple operators in the same licensed area.

