

Before
UTTARAKHAND ELECTRICITY REGULATORY COMMISSION

Petition No. 21 of 2017

In the Matter of:

Petition seeking investment approval on the project for implementing Integrated Automatic Meter Reading (IAMR) System on 12000 nos. of consumers to be executed on turnkey basis.

And

In the Matter of:

Uttarakhand Power Corporation Limited. (UPCL),
Dehradun.

...Petitioner.

Coram

Shri Subhash Kumar Chairman

Date of Order: September 28, 2017

ORDER

This Order relates to the Petition filed by Uttarakhand Power Corporation Limited (hereinafter referred to as "UPCL" or "the Petitioner" or "the licensee") seeking approval of the Commission for investment approval on the project for implementing Integrated Automatic Meter Reading (IAMR) System on 12000 nos. of consumers to be executed on turnkey basis.

Background

2. The Petitioner vide its letter No. 1867/UPCL/Com/IAMR/D(O) dated 04.05.2017 submitted Petition for investment approval under the provisions of the Regulation 40(1) & Regulation 59(1) of UERC (Conduct of Business) Regulations, 2014 read with relevant provision of the Electricity Act, 2003, and the Rules and Regulations made thereunder.

3. The Petitioner in its Petition has submitted that:
- (1) It is having a consumer base of approximately 20 Lakhs. Out of which, approximately 22,000 consumers (industrial category consumers having load 5 kW & above and commercial category consumers having load 10 kW & above) have been identified as Key Consumers (KCC). An online billing platform has been established for these Key Consumers enabling it to monitor such Consumers centrally from its headquarters.
 - (2) Total consumers having load >15KW are approximately 12,000 in numbers and it has been decided that they shall be covered under Integrated Automatic Meter Reading (IAMR) System.
 - (3) Consumers having load > 15 KW forms approximately 0.5% of total consumer base of UPCL and contributes to around 50% of total revenue i.e. approx. 230 Crore per month.
 - (4) GSM based IAMR project for around 4200 nos. consumers has been implemented in past and the same is running successfully.
 - (5) The GSM based IAMR system is working satisfactorily but considering the advancement in technology, it has now planned to install GPRS based IAMR system for the consumers under KCC cell which would allow it to monitor the meter reading data of these consumers fetched through automatic meter reading system and integration of the same to the centralized consumer billing centre/key consumer cell along with analysis of meter reading.
 - (6) In the proposed scheme Meter Data Acquisition System at central data centre will acquire meter data from Automatic Meter Reader (AMR) and for this purpose will select consumer meters automatically from remote end avoiding any human intervention. The installed centralised system will monitor important distribution parameters, provide the meter data for accurate billing purposes and generate exceptions and MIS reports for proper planning, monitoring, decision support and for taking corrective actions on the business activities by the management. The said objective is achieved by providing an AMR based data logging system using any of the available communication technologies like GSM/GPRS covering selected consumer

meters in the entire utility area. Further the central data centre acquires & store data of energy meters of various makes installed at HT/selected LT consumer ends.

- (7) In GPRS based IAMR system the installed AMRs will push the entire meter data to central data centre on incremental basis at a regular interval as desired by the end customer through GPRS network for data aggregation, analysis and generation of MIS reports and this is the main advantage of GPRS system over GSM based project.
- (8) Estimated cost of onetime cost of GPRS based IAMR project is as follows:-

Sl. No.	Item description	Amount (₹in Crore)
1	Modem along with box supply (for 12000 modems @ ₹6000 per modem including box).	7.20
2	Hardware	0.12
3	Software	0.30
Total		7.62

That already successfully working 4000 Numbers modems against existing project are required to be upgraded and if possible these modems will be configured to GPRS technology and will be merged with new GPRS based project. This exercise may reduce the requirement of around 4000 new modems and in turn will reduce the project cost by ₹2.00 Crore (5000X4000). Thus total costing for covering 12000 KCC consumers under GPRS based IAMR technology may come down to ₹5.62 Crore as the same would not include cost of 4000 modems. The present project is primarily a new project and encompasses up-gradation of small existing system when the same is technically possible.

- (9) Board of Directors in its 79th Board Meeting held on 28th March 2017 has approved the proposal.
- (10) The fund for implementation of the scheme is arranged partially from REC (70%) and remaining 30 % through Internal Sources of UPCL.

(11) The main benefits of IAMR system as projected by the Petitioner are as follows:

- Meter reading data of key consumers can be viewed online anytime.
- It provides services such as integration of energy meter data to centralized consumer billing center (i.e. key consumer cell).
- Increase in revenue due to reduced metering errors.
- Savings on working capital interest due to timely availability of revenue from KCC consumers.
- Savings on meter reading cost (reduced travelling for taking meter reading through MRI).

(12) The summary of the proposal as submitted by the Petitioner is as follows:

Description	Value
Project Cost for IAMR (₹ Lakhs)	762
No. of key consumers to be covered	12,000
Minimum time in days, reduced by GPRS based AMR system (taken on lower side)	10
Savings per month due to reduction in time in assessment and collection of 12,000 consumers.(₹in Lakhs)	25.2
Payback time period (in months)	31
Project Implementation Period (Days)	150

4. The Commission heard the matter for admissibility on 16.07.2017 and admitted the Petition.
5. On examination of the Petition certain deficiencies/requirement of additional information were identified, the Commission vide its letter No. 539 dated 30.06.2017 directed the Petitioner to submit its compliance on the following latest by 07.07.2017:-

“1. In 79th BoD held on 28.03.2017, the Board of Directors had accorded approval for implementation of Integrated Automatic Meter Reading (IAMR) with estimated cost for 5 years as Rs. 30.82 Crores. Whereas, as per Petition and DPR the total project cost for IAMR system on 12000 consumers on turnkey basis is Rs 7.62 Crores.

In this regard, UPCL is required to clarify the difference between the project cost approved in the BoD and that in the Petition. Further, UPCL has to clarify the significance of 5 years in the BoD approval.

2. UPCL in its Petition at S.No. 4 (ix) has submitted that existing GSM based IAMR system is successfully working for 4000 consumers and UPCL is planning to upgrade them to GPRS based IAMR system.
In this regard, UPCL is required to furnish:-
 - Benefits of GPRS based IAMR system over GSM based IAMR system.
 - Reasons compelling it to replace existing GSM based IAMR system with GPRS based IAMR system when they are working successfully.
3. UPCL is required to submit technical specifications of existing GSM based IAMR modems and proposed GPRS based IAMR modems.
4. UPCL is required to furnish the failure rate of GSM based IAMR modems.
5. UPCL is required to submit the REC approval letter for funding of the debt.
6. Further, UPCL is required to submit:-
 - Whether any recurring cost of GPRS service provider would be incurred in the project, if so, then UPCL is required to furnish the details of the same and submit revised cost benefit analysis after considering the same."

6. In compliance, UPCL vide letter No. 2737 dated 05.07.2017 submitted its point-wise reply as follows:-

"Point No. 1

UPCL has filed petition for investment approval against capital investment. As intimated in petition dated 04.05.2017, point no. 4, "Facts of the case" IX point, estimated one time cost of project is as below:-

Table No. 1

Sl. No.	Item description	Amount
1	Modem along with box supply (for 12000 modems @Rs. 6000 per modem including box).	Rs. 7.2 Cr.
2	Hardware	Rs. 12 Lacs.
3	Software	Rs. 30 Lacs.
Total		Rs. 7.62 Cr.

- Already running IAMR project is considered for cost analysis (copy enclosed as annex-I)

Total costing for covering 12000 KCC consumers under GPRS based technology IAMR for five years is as follows:-

Table No. 2

Sl. No.	Item description	Amount
1	One time cost (Rs. 7.62 Cr. – Rs. 2.00 Cr.) *cost of already existing 4000 modems not included.	Rs. 5.62 Cr.
2	Cost for meter reading along with analysis report for Five year (@Rs. 5.04 Cr. For one year)	Rs. 25.2 Cr.
Total Cost for IAMR of 12000 consumers for Five years		Rs. 30.82 Cr.

Cost of meter reading and analysis part is under "Operation and Maintenance". Regarding significance of 5 years it is to submit that, technology up gradation has been considered, and it is evident that electronic items and communication, technology upgrades in every 3-4 years. Therefore it is beneficial to upgrade technology at most in every 5 years.

Also considering existing IAMR agreement warranty of modem is assumed as 5 years. Therefore system may be out of warranty in five years.

Proposed project is for five years and depending upon future condition, if required after completion of five years, same shall be extended through AMC.

Point No. 2

Benefits of GPRS based IAMR system over GSM based IAMR system are as below:-

- a. GPRS based system is much faster thus there is enhancement in meter reading fetching speed.
- b. It is upgraded technology (packet based data transfer instead of dialing based data transfer), thus there is increase in success rate.

Reason compelling it to replace existing GSM based IAMR system with GPRS based IAMR system:-

Apart from above mentioned benefits it is to intimate that in existing GSM based IAMR system there are 20 modems at date centre which dials modems installed at consumer site. Central modem dials consumer modems and 1-2 minutes continuous communication is required for successful meter reading fetching. If link breaks in between then whole process starts again, information fetched till then is lost. However in case of GPRS based IAMR system if link breaks in between then information fetched till then is saved, thus continuous communication is not necessary.

UPCL is paying AMC against existing system @ Rs. 62,25,000 per annum at present. It is beneficial for UPCL to convert these to GPRS mode and shift existing modems to new GPRS based IAMR system.

Point No. 3

Attached as annexure-II.

Point No. 4

GSM based IAMR System (Running Status)

Month	Total Installed Modems	Successful Readings	Success rate%
Aug-16	5602	4111	73.38
Sep-16	5596	3912	69.91
Oct-16	5590	4022	71.95
Nov-16	5565	3922	70.48
Dec-16	5549	3984	71.80
Jan-17	5523	4074	73.76
Feb-17	5508	4115	74.71
Mar-17	5428	4186	77.12
Apr-17	5383	4150	77.09
May-17	5221	4213	80.69
Jun-17	5157	4145	80.38

Point No. 5

Attached as annexure-III.

Point No. 6

Cost of service provider has been included in "meter reading cost along with analysis which is part of "Operation and Maintenance"."

7. Discussions were held with officers of the Petitioner in the Commission's office on various occasions including a meeting held on 25.07.2017 in the matter, vide which the Petitioner informed that in its instant Petition, it is requesting only for the approval of capital investment related to modems, software & hardware, whereas, the O&M expenses for the project has not been included in the Petition. In this regard, the Petitioner was informed that usually the project investment approval is assessed based on the project life cycle cost and the project cost should not only include the capital investment but also the operating expenses incurred during the life cycle of the project. Since, the total life cycle cost of the project gives a better picture of cost-benefit analysis, helping in analyzing a prudent investment, therefore, the Petitioner was suggested to include O&M expenses in the cost benefit analysis.
8. In compliance to the same, UPCL vide its letter No. 3167 dated 01.08.2017 submitted its revised cost-benefit analysis including the savings on account of salary of its officers and savings due to reduced travel. The summary of the cost-benefit analysis as submitted by the Petitioner is as follows:

Description	Value
Project Cost for IAMR (₹ Lakhs)	3082
No. of key consumers to be covered	12,000
Minimum time in days, reduced by GPRS based AMR system (taken on lower side)	10
Savings per month due to reduction in time in assessment and collection of 12,000 consumers.(₹in Lakhs)	25.2
Assuming that UPCL officials will not have to visit the consumer sites for MRI of 12,000 consumers, therefore, Savings in terms of their salary (₹in Lakhs).	28.6
Estimated cost saving due to reduced travel (₹in Lakhs)	8.3
Total saving per month (₹in Lakhs)	62.1
Payback time period (in Years)	4.14

Commission's Observations, Views & Directions

9. On examination of the Petition and subsequent submissions of the Petitioner following has been observed by the Commission:-
- (1) The Petitioner has proposed for covering 12,000 consumers under GPRS based IAMR system in its instant Petition which includes 4,000 existing consumers already covered under GSM based IAMR system. The Petitioner

has also submitted that in case existing 4,000 nos. GSM based modems are upgradable to GPRS based technology, then it would result in a cost saving of ₹2.00 Crore in onetime cost of the project cost.

- (2) As per BoD approval dated 28.03.2017, the estimated cost of the Project is ₹30.82 Crore. However, in the instant Petition, the investment proposal brought before the Commission is for ₹7.62 Crore, which is proposed for the procurement of 12,000 Nos. Modems alongwith the box, hardware & related software and the same is to be executed on turnkey basis.
 - (3) As per Petitioner's submission, an amount of ₹25.20 Crore would be incurred under Operation & Maintenance head for meter reading alongwith analysis report for five years and the same has not been included in their Petition.
 - (4) As per Petitioner's submission dated 01.08.2017, the total financial benefits expected after the implementation of the GPRS based IAMR System would be ₹62.1 Lakh per month which would be sufficient to payback an investment of ₹30.82 Crore in a period of approx. 4 years.
 - (5) With regard to the existing GSM based IAMR system, the Petitioner has submitted that the success rate of the readings for the period August, 2016 to June, 2017 was in the range of 69.91% to 80.69% and an expenditure of ₹62,25,000.00 per annum has been also incurred against Annual Maintenance Contract (AMC). Further, the Petitioner has also submitted that in GPRS based IAMR system, meter reading fetching is based on packet based data transfer, which is much faster than dialing based data transfer of GSM based IAMR system.
10. Further, on the basis of submissions of the Petitioner and observations made above, the Commission is of the view that:-
- (1) The Petitioner should submit its Petition for investment approval before the Commission considering the total project life cycle cost i.e. capital cost plus operating cost for the life cycle as the same gives a better picture of profitability from the project.
 - (2) Though, the Commission always appreciates automation and adoption of newer technology for up-gradation of the Systems specifically for the

technologies which involves least manual intervention, however, the Commission cautions the Petitioner that before introducing/adopting the newer technologies, it should carefully examine and analyse the same holistically. Further, the Commission strongly believes that any new technology solution should not only be sustainable but should also generate enough financial benefits which would be sufficient to recover the investment incurred in a project. Further, the Commission is of the view that any technological up-gradation should also result in minimization of O&M expenses.

- (3) The Petitioner should submit a valid document for the loan funding as in the proposed investment, the Petitioner submitted a four year old approval of REC with 12.50% per annum rate of interest.
 - (4) **With regard to O&M expenses of ₹25.20 Crore for a period of 5 years for the IAMR System as mentioned in Petitioner's submissions dated 05.07.2017 & 01.08.2017, the Commission does not agree with the same and is of the view that these O&M expenses are exorbitantly high. Keeping in view of higher O&M expenses, the licensee should revisit the scope of O&M works specified for the said project and prepare a mechanism for in-house data analysis and preparation of report by licensee's officers/staff, as this would not only reduce the proposed O&M expenses but also be beneficial for the licensee in developing its in-house capability as well as reducing its over dependency on the external agencies.**
 - (5) Therefore, the Commission suggests that in order to minimize both the procurement as well as running cost, the Petitioner should strictly follow competitive bidding process as per prevailing rules.
11. Based on the submission made in the Petition & subsequent information/ documents, discussions held with the officers of the Petitioner and in view of the intangible benefits mentioned at para 3 (11) above, the Commission grants in-principle approval for the proposed onetime capital cost for hardware, software and supply of Modems required for implementing GPRS based Integrated Automatic Meter Reading System on 12,000 consumers to be executed on turnkey basis subject to the following conditions:-

- (1) The Petitioner is directed to obtain the prices for the proposed procurement of equipment namely modems, associated hardware and software relevant to the project under the prevailing Rules & Regulations. Prudence of the prices would be scrutinised by the Commission at the time of fixation of tariff after completion of the works.
- (2) The Petitioner shall explore every possibility to convert existing 4,000 GSM based IAMR System into GPRS based IAMR System so that the expected saving of ₹2.00 Crore can be achieved for the project.
- (3) All the loan conditions as may be laid down by the funding agency in their detailed sanction letter are strictly complied with. However, the Petitioner is directed to explore the possibility of swapping the loan with cheaper debt option available in the market.
- (4) The Petitioner shall revisit the scope of O&M works specified for the said project as suggested by the Commission at para 10 (4) above in order to minimize the Operation & Maintenance expenses of the project.
- (5) After completion of the aforesaid works, the Petitioner shall submit the completed cost and financing of the project.
- (6) The project shall be completed as per project implementation schedule provided in the Petition.
- (7) The cost of servicing the project cost shall be allowed in the Annual Revenue Requirement of the Petitioner after the assets are capitalized and subject to prudence check of the cost incurred.

Ordered accordingly.

(Subhash Kumar)
Chairman