

Before

UTTARAKHAND ELECTRICITY REGULATORY COMMISSION

Petition No. 36 of 2016

In the matter of:

Re-determination of generic tariff for Pathri Small Hydro Generating Station (3 X 6.8 MW) of UJVN Ltd. under Section 62, 86 and 94(1)(f) of the Electricity Act, 2003 read with the relevant Regulations, Orders and Guidelines of the Commission.

And

In the matter of:

Re-determination of generic tariff for Mohammadpur Small Hydro Generating Station (3 X 3.1 MW) of UJVN Ltd. under Section 62, 86 and 94(1)(f) of the Electricity Act, 2003 read with the relevant Regulations, Orders and Guidelines of Commission.

In the matter of:

UJVN Ltd.

...Petitioner

And

In the matter of:

Uttarakhand Power Corporation Ltd.

...Respondent

CORAM

Shri Subhash Kumar Chairman

Shri K.P. Singh Member

Date of Order: November 30, 2016

This Order relates to two Petitions filed by UJVN Ltd. (hereinafter referred to as "Petitioner" or "Generator") under Section 62, 86 and 94(1)(f) of the Electricity Act, 2003 (hereinafter referred to as "Act") read with relevant regulations and guidelines of the Commission for determination of final tariff for UJVN Ltd.'s 21.4 MW Pathri SHP and 9.3 MW Mohammadpur SHP.

Since the relief and prayer made by UJVN Ltd. in respect of the Petition filed for Mohammadpur SHP was similar to that of the Petition filed for Pathri SHP, accordingly, the Commission decided to club both the petitions and issue a common Order in the matter.

1. Background and Petitioner's Submissions

- 1.1 The Petitioner, UJVN Ltd., is a company incorporated under the provisions of the Companies Act, 1956, having its registered office at UJJWAL, Maharani Bagh, GMS Road, Dehradun. The Government of India (GoI) vide its order dated November 5, 2001 transferred all the hydropower generating assets located in the State of Uttarakhand to UJVN Ltd., with effect from November 9, 2001.
- 1.2 The Petitioner vide its above mentioned Petitions submitted that the Pathri SHP is in operation since 1955 and Mohammadpur SHP is in operation since 1952. It is also a generally accepted principle that the life of a Small Hydro Power Plant is considered to be 35 years which is also considered by the Commission in the various Regulations issued from time to time. Therefore, both the SHPs have been in service for nearly double of their expected life.
- 1.3 The Petitioner submitted that the existing tariffs for Pathri & Mohammadpur are Rs. 1.05/kWh & Rs. 1.20/kWh respectively as determined by the Commission in its Tariff Order dated 19 May, 2009 w.e.f. 01 April, 2008 which would remain valid for a period of 30 years. The relevant extract of the said Order is as follows:

"2.12 Tariff

(45) Thus, based on the above discussions, the Commission has worked out and approved the following levelled tariffs given in the Table 4 below for the 7 stations in the Petition filed by the Petitioner w.e.f. 01.04.2008. The tariffs applicable w.e.f. 01.04.2008 for the balance 4 stations commissioned after 01.01.2002 are those specified in Schedule 1 of the Regulations, for which determination is not required, and are also given in the Table 4 given below.

Table 4: Tariff approved by the Commission for UJVNL's SHPs

S. No.	Name of the SHP	Capacity (MW)	Year of Commissioning	Levelised tariff Rs./kWh
1	Chirkila	1.5	1997-98	1.90
2	Relagad	3	2004-05	2.55
3	Kanchuti	2	1993-94	1.70
4	Kulagad	1.2	1995-96	1.80
5	Badrinath	1.25	2004-05	2.55
6	Pilangad	2.25	2003-04	2.55
7	Urgam	3	1998-99	1.95
8	Galogi	3	1907-08	1.25
9	Jummagad	1.2	2008-09	2.80
10	Mohammadpur	9.3	1952-53	1.20
11	Pathri	20.4	1955-56	1.05

(46) These tariffs have been made effective from 01.04.2008 as the Regulations came into force with effect from 01.04.2008 and shall be valid for a period of 30 years from this date."

- 1.4 The Electricity Act, 2003 which became effective from 10.06.2003, transferred the functions of determination of generation tariff from the State Government to the Commission.
- 1.5 The Generator vide its above mentioned two petitions submitted that the 20.4 MW Pathri SHP was commissioned in the year 1955 and Mohammadpur SHP was in operation since 1952. Hence, both the SHPs were in operations for more than 58 years & 61 years respectively. The Generator further submitted that the capacity of the machines of the two SHPs had been derated. Overall capacity of 20.4 MW Pathri SHP came down to 18.6 MW due to long run, generating units have got de-rated and the condition of their auxiliaries, instruments, protective relays & control equipments deteriorated. Silt contents in water caused erosion of runner and other under water parts, defunct automation system, obsolete equipment, frequent breakdown of equipment, non availability of spare parts were major bottlenecks of the plant.
- 1.6 Similarly, capacity of Mohammadpur SHP came down to 6.5 MW against the rated capacity of 9.3 MW due to wear & tear and erosion/damages of underwater parts. The governors, excitation system, generators and turbines had become very old and obsolete. The automation system of power station was defunct and hydro mechanical equipments had erratic functioning. Switchyard equipments had already completed their useful life. Due to the equipments being very old, the non-availability of spares was also a day to day problem.
- 1.7 The Petitioner submitted that being committed to operate the Pathri & Mohammadpur SHPs even after achieving the economic life of the power plant, it was not feasible to operate the plant without additional capitalization, Renovation and Modernisation. Accordingly, the Generator submitted that they had decided to carry out the Renovation and Modernisation for the SHPs, in order to enhance its economic life in public interest as the combined generation capacity of the machines had reduced.
- 1.8 The Petitioner submitted that since the equipments were very old, the non-availability of spares was also a day to day problem. In view of the above facts and to extend the life, enhancing performance for further 30 years and to derive additional benefits, the Renovation and Modernization (R & M) of the hydro generating machines including auxiliaries and other associated equipments/systems of the two SHPs had become necessary.
- 1.9 The Generator had prepared a DPR amounting to Rs. 80.82 Crore (without IDC) and Rs.

92.82 Crore (with IDC), for Renovation and Modernization of the Pathri SHP in Dec, 2009 which was approved by Board of Directors of UJVN Ltd in its 53rd BoD meeting held on 10.02.2010. However, based on the “Reverse Engineering” report carried out by the contractor the cost of RMU works was revised to Rs. 99.06 Crore (without IDC) and Rs. 113.25 Crore with IDC by the Board of Director’s in 67th BOD’s meeting. The Petitioner submitted that the completed cost of RMUs works of Pathri SHP is almost similar to the cost of installing a new plant.

- 1.10 In respect of Mohammadpur SHP, the Petitioner submitted the detailed series of events occurred w.e.f. year 2002 to year 2010 for finalisation of DPR with estimates of RMU work for Rs. 53.66 Crore (without IDC) and Rs. 64.35 Crore (with IDC) approved by Board of Directors in 53rd meeting on February 10, 2010. However, the completed cost of the RMU work was Rs. 76.21 Crore (including IDC of Rs. 2.89 Crore).
- 1.11 The Petitioner submitted that since RMU works of both the SHPs were completed after notification of UERC (Tariff and Other Terms for Supply of Electricity from Renewable Energy Sources and non-fossil fuel based Co-generating Stations) Regulations, 2013, hence, generic tariff specified in the regulations should be applicable on these SHPs. The Petitioner while referring to the Second Amendment of RE Regulations, 2013 requested for applicability of tariffs of Rs. 4.21/kWh & Rs. 4.52/kWh for Pathri & Mohammadpur SHPs respectively.
- 1.12 The copies of the Petitions were forwarded to UPCL for comments. UPCL vide its reply dated 12.12.2014 submitted that tariffs for both the SHPs had been determined vide the Commission’s Order dated 19.05.2009 and the same was applicable for 30 years w.e.f. 01.04.2008. UPCL submitted that it had entered into a power purchase agreement dated 24.07.2012 having legal and binding effect between the Petitioner & UPCL and the same is effective till 31 July 2017. UPCL contended that neither the Chapters 4 & 5 of the RE Regulations, 2013 nor the Regulation 48 of the RE Regulations, 2008 would be applicable on the above mentioned SHPs of the Petitioner. UPCL submitted that the RE Regulations, 2008 also specify that no true up of any parameter including additional capitalization for whatsoever reasons, shall be taken up during the validity of the tariff.
- 1.13 The Commission also held a hearing in the matter on 22.12.2014 and sought information related to generation of the SHPs and cost incurred on the same.
- 1.14 The Petitioner vide its reply dated 30.01.2015 provided the information partly and sought

extension of time for submitting the reply on the pending matters. The Commission vide its letter dated 25.02.2015 accepted the request for extension of time and asked the Petitioner to submit the information latest by 04.03.2015 alongwith certain other information necessitated by the Commission. However, the Petitioner vide its letter dated 31.03.2015 once again requested the Commission for extension of time for submitting the additional information. The Commission vide its letter dated 13.04.2015 accepted the request of the Petitioner to submit the information latest by 30.04.2015 and directed it to submit the pending information with reference to Commission's letter dated 25.02.2015 at the earliest.

- 1.15 Further, since the Regulations do not provide any norms for RMU related works of renewable based generating stations, analysis of capital expenses incurred by UJVN Ltd. on both the SHPs was got conducted by Central Electricity Authority. CEA submitted its report in the month of May, 2016. The Report submitted by CEA has been discussed in subsequent Para of this Order.

2. Commission's Approach & Analysis

The Pathri & Mohammadpur SHPs are in operations since last 60 years or more, i.e. more than one & half time of the life specified in regulations. Therefore, before discussing on analysis and conclusion on the Petitions filed by UJVN Ltd., circumstances and background of regulatory eventualities have been recollected in initial few subsequent Paras.

- 2.1 The Commission in its first Tariff Order for UPCL dated 08.09.2003 had directed UPCL to work out the updated rate of power to be purchased from UJVN Ltd. and submit the same for Commission's approval by 31.12.2003. However, neither UPCL nor UJVN Ltd. approached the Commission to get the generation tariff fixed for the small hydro stations. The Commission was forced to compel the generators to get their tariffs determined. In its Tariff Order dated 25.04.2005 for UPCL, the Commission observed that:

*"Tariffs of other stations of UJVNL, UREDA and others have not been got determined so far. It may be recalled that under section 62(1)(a) of the Act, the generation tariff for supply of electricity by State generators to State Licensee is to be determined by this Commission. All these generating stations are presently charging tariffs which do not have legal sanctity. For working out the power purchase cost, the Commission has taken their present rates into account but these will be replaced by the rates that the Commission may approve for each of them. **UPCL is hereby directed that if these generating stations do not get their tariffs determined by the Commission even by 30.09.05, then w.e.f. 01.10.05 they will be paid only at the highest rate approved by the Commission for the***

main generating stations of UJVNL, which is 38.69 p/kWh or the present tariff, whichever is lower."

- 2.2 The Petitioner had filed the applications for determination of tariff for the SHPs on 28.09.2005 which were returned by the Commission as the applications were not supported by details and justifications regarding capital cost and other operational details claimed by the Petitioner. The applications were again re-submitted during the year 2006 which were again returned by the Commission for the same reasons.
- 2.3 On the applications submitted by the Petitioner, the Commission vide its order dated 01.12.2006 and 05.04.2007 allowed the tariff on the basis of weighted average cost of Power allotted to the State from Central Generating Station in case of UJVNL SHPs upto 1 MW capacities.
- 2.4 Subsequently, the Commission had notified its UERC (Tariff and Other Terms for Supply of Electricity from Non-conventional and Renewable Energy Sources) Regulations, 2008 (hereinafter termed as "Regulations"), on 30.04.2008, which were effective from 01.04.2008, whereby, it repealed its Orders on Approach to Determination of Tariff for Small Hydro Power Projects with Capacity upto 1 MW (including the amendment Regulation dated 18.05.2007) and New SHPs above 1 MW and upto 25 MW dated 10.11.2005. The Commission had specified the normative tariffs for SHPs in the Regulations which were not to be applicable on generating stations commissioned before 1.1.2002 and their existing tariffs were made applicable till they were decided by the Commission on case to case basis.
- 2.5 The Petitioner had filed Petition on 14.07.2008 wherein it requested the Commission to allow it the tariff equal to that of the weighted average cost of power allocated to the State from central generating stations in the case of 8 SHPs of capacity above 1 MW and up to 5 MW. Subsequently a Supplementary Petition was filed on 17.02.2009 seeking final tariff for 11 Small Hydro Plants including Pathri & Mohammadpur SHPs as per UERC (Tariff and Other Terms for Supply of Electricity from Non- conventional and Renewable Energy Sources) Regulations, 2008.
- 2.6 Since the RE Regulations, 2008 were not applicable on these two SHPs, the Commission had worked out the capital cost of these SHPs based on the norms specified in the RE Regulations, 2008 with certain modifications made in the normative capital cost for these stations considering their date of commissioning as discussed in the Order dated 19.05.2009 issued by the Commission. Moreover, while determining the tariffs of these SHPs no

additional capitalisation had been considered after the CoD in the absence of details. Therefore, the Commission appreciates the fact that the tariffs applicable in respect of Pathri & Mohammadpur SHPs, so far, were not fixed on the actual Capital Cost.

2.7 Now, UJVN Ltd. in the instant Petition has sought relaxation under RE Regulations, 2008 and has also referred to the powers of the Commission for reviewing its Orders u/s 94(1)(f) of the Act. In this regard, the Commission had notified its RE Regulations, 2008 wherein it was provided that the tariffs specified in the Regulations would not be applicable for generating stations commissioned before 01.01.2002 and their tariffs shall continue to be applicable till they are decided by the Commission on case to case basis. Accordingly, the Commission vide its Order dated 19.05.2009 determined the tariff of Rs. 1.05/kWh and Rs. 1.20/kWh for the Pathri and Mohammadpur SHP respectively. However, the Commission subsequently notified its RE Regulations, 2010 which repealed its RE Regulations, 2008. Accordingly, relaxation sought by UJVN Ltd. under RE Regulations, 2008 is not maintainable. Further, UJVN Ltd. also referred to the powers of the Commission for reviewing its Orders u/s 94(1)(f) of the Act. This contention of UJVN Ltd. is also not valid as the review sought by UJVN Ltd. is of the Commission's Order dated 19.05.2009 issued more than 5 years ago, and in accordance with the UERC (Conduct of Business) Regulations, 2004, the review Petition has to be filed within 90 days of the issuance of the Order, accordingly, the review is also time barred now. Moreover, UJVN Ltd. has requested the Commission to treat the date of commissioning of the SHPs as the date when RMU activity is completed and allow generic tariff as per RE Regulations, 2013.

2.8 The Commission had notified the UERC (Tariff and Other Terms for Supply of Electricity from Renewable Energy Sources and non-fossil fuel based Co-generating Stations) Regulations, 2013 effective from 15.04.2013 which superseded the UERC (Tariff and Other Terms for Supply of Electricity from Non-conventional and Renewable Energy Sources) Regulations, 2010. Further, the RE Regulations, 2013 stands applicable for generating stations commissioned after coming into effect of these regulations.

2.9 In this regard, relevant provision of the RE Regulations, 2013 are reproduced hereunder:

2nd Proviso to Regulation 2(1):

"Provided further that Regulations in Chapter 4 & 5, shall not be applicable for generating stations commissioned prior to coming into effect of these Regulations and their present tariffs shall continue to be applicable..."

2.10 Thus, a plain reading of the above referred Regulations clearly states that the two SHPs for

which tariff has been sought by UJVN Ltd. can in no way be covered under RE Regulations, 2013 as the date of completion of RMU cannot be considered as the date of commissioning of the projects as the commissioning has already taken place and there cannot be two dates of commissioning.

- 2.11 RMU of hydro power station is carried out to increase the life of the Project. RMU of old hydro power stations is not only beneficial in enhancing the capacity of the plant but also help in the life extension of the plant by another 25 -35 years depending on the degree of RMU. Renovation (or Rehabilitation or Refurbishment) aims at extending the life while Modernisation aims at enhancing the performance and Upgradation aims at increasing the station capacity.
- 2.12 As already stated by the Petitioner, the projects were generating electricity even prior to the RMU of these projects but were operating at a lower capacity. Hence, in no way the date of commissioning of the project can be construed as the date of completion of the RMU. Furthermore, it would not be out of place to mention that the actual cost excluding IDC after RMU activity as claimed by the Petitioner and validated by CEA for Pathri and Mohammadpur SHP is Rs. 105.04 Crore and Rs. 73.32 Crore. On examination of the same, it is evident that almost all the works carried out are towards Electromechanical and hydro mechanical activities with civil works being very negligible. While the norms of capital cost specified in RE Regulations, 2013 comprise of land, rehabilitation, civil works and E&M and H&M works. Since, in the RMU activity carried out by the Petitioner the works are almost limited to Electromechanical and hydro mechanical activities. Thus, there is no premise due to which the generic tariffs as per RE Regulations, 2013 applicable to new SHPs commissioned after the notification of these Regulations be made applicable to Pathri and Mohammadpur SHPs.
- 2.13 However, as discussed above, the Commission has noted the fact that Pathri and Mohammadpur SHPs are in operation since the year 1955 & 1952 respectively, implying that, these SHPs are in service for more than 60 years. The Capital Cost of Pathri and Mohammadpur SHPs considered by the Commission vide the Order dated 19.05.2009 was Rs. 0.20 Crore & Rs. 0.16 Crore respectively. Since the SHPs have already outlived their normative life of 35 years, accordingly, depreciation & interest on loan were not allowed for fixation of tariffs vide the Order dated 19.05.2009. Further, being old projects it cannot be denied that the essential parts of the plants got deteriorated with the passage of time leading to frequent breakdown and interruption in operation of the SHPs as was also

evident from the details of availability submitted by the Petitioner. Pre-RMU average generations of Pathri & Mohammadpur SHPs were in the range of 100 MU & 40.44 MU respectively whereas, the generation from these plants subsequent to completion of RMU works has been proposed as 135.87 MU & 64.92 MU respectively. Hence, requirement of RMU of the assets created about 60 years ago cannot be denied so as to increase the life and efficiency of the SHPs.

- 2.14 While framing the Regulations, the Commission did not foresee such exigencies where stranded projects were to be revived or the projects who had outlived their lives necessitated RMU activities, and accordingly, no provision was made in the Regulations for inclusion of the same. Accordingly, the Commission in exercise of its power vested under Regulation 50 of RE Regulations, 2013 decides to relax the Regulations to include those projects who are either stranded or have outlived their life and require RMU to revive them. The Commission would determine tariffs for such projects after the RMU activity is carried out suitably adjusting for historical costs of the project in accordance with the operational norms specified under RE Regulations, 2013.
- 2.15 Accordingly, the Commission while appreciating the necessity of the RMU of the SHPs has decided to allow project specific tariffs in accordance with the norms of the prevalent Regulations. Although the capital cost of the SHPs post RMU appears on a higher side, but since CEA has already validated the capital cost of Pathri and Mohammadpur SHPs, the Commission decided that the project specific tariff be determined considering the operating norms, other than the capital cost, as specified in the RE Regulations prevalent at the time of completion of the RMU works.
- 2.16 Since RMU works of Pathri and Mohammadpur SHPs got completed on 31.08.2014 & 21.07.2013 respectively, hence, norms specified in the RE Regulations, 2013 have been applied based on the Capital Cost validated by CEA as discussed in subsequent Paras.

3. Tariff Fixation

3.1 Design Energy

3.1.1 Clause (a) of Regulation 10(3) of the RE Regulations, 2013 specifies as under:

“(a) For projects opting to have their tariffs determined on the basis of actual capital cost instead of normative capital cost as specified for different technologies under Chapter 5, the CUF (generation) for recovery of fixed charges shall be taken as that envisaged in the approved DPR or the normative CUF specified under Chapter 5 for the relevant technology, whichever is higher;”

In accordance with the regulations normative CUF for SHPs is 40%, whereas, DPRs of the Pathri & Mohammadpur SHPs envisage design energy of 155.60 MUs and 64.92 MUs respectively, i.e. CUF of 87% & 80% respectively. Further, CEA also observed/recommended that the annual design energy for the Pathri & Mohammadpur SHPs as 155.60 MUs 64.92 MUs respectively are acceptable and the same may be considered for finalization of tariffs.

3.1.2 Accordingly, for the purposes of tariff determination, in accordance with the Regulations and recommendations of CEA, design energy of Pathri & Mohammadpur SHPs have been considered as 155.60 MUs and 64.92 MUs respectively. Accordingly, saleable energy for these two SHPs have been determined based on the normative auxiliary consumption of 1%.

3.2 Capital Cost

3.2.1 The capital costs have already been validated by CEA regarding works executed and cost incurred thereon including prudence check of the expenditure incurred in RMU works of Pathri & Mohammadpur SHPs of UJVN Ltd.

3.2.2 CEA in its report has observed/recommended that the execution of R&M works was necessary for life extension of the power station. CEA further in its report stated that the works have been audited by AG Auditors and the Auditors have not found any discrepancies/anomalies in completed cost with respect to the Contract Agreement for the said RMU works and the completed cost of RMU works of Rs. 105.04 Crore in respect of Pathri SHP bifurcated into E&M works amounting to Rs. 96.57 Crore & Hydro-Mechanical and Civil Works amounting to Rs. 8.47 Crore is generally in order. Similar observation has also been made on Mohammadpur SHP regarding completed cost of RMU works of Rs. 73.32 Crore bifurcated into E&M works amounting to Rs. 63.11 Crore & Hydro-Mechanical and Civil Works amounting to Rs. 10.22 Crore is generally in order. CEA also stated that the increase in Completed Cost vis-à-vis Awarded Cost was on account of price escalation as per contract provisions.

3.2.3 In view of the observation/recommendations of CEA, as discussed above, the Commission has considered the Capital Cost validated by CEA for Pathri SHP as Rs. 105.04 Crore for the purposes of tariff calculation. Similarly, the Commission has considered the Capital Cost validated by CEA for Mohammadpur SHP as Rs. 73.32 Crore for the purposes of tariff calculation.

- 3.2.4 The Petitioner in its Petition had submitted the details of MNRE Grant sanctioned for both the Pathri & Mohammadpur SHPs amounting to Rs. 12.20 Crore & Rs. 6.65 Crore respectively against which an amount of Rs. 3.05 Crore & Rs. 5.99 Crore was received till date by the Petitioner as per their reply dated 05.08.2016.
- 3.2.5 The Petitioner was asked to submit the reasons for shortfall in receipt of grant to which the Petitioner vide its reply dated 21.09.2016 stated that the matter of release of sanctioned grant for Mohammadpur and Pathri SHPs was taken up with the MNRE to which MNRE replied that further fund to the Petitioner will be considered for release by MNRE only on receipt of all Utilization Certificates against earlier released funds and project wise progress reports. Since the non-release of subsidy amount is attributable to the non-compliance of pre-requisites on the part of the Petitioner and was not due to change in any law or policy by the appropriate authority, hence, the original sanctioned amount of subsidy has been considered for the purposes of tariff calculation.
- 3.2.6 The Commission also noted that the capital expenditure in respect of two SHPs approved by CEA constitutes only the hard cost, i.e. without including the IDC component of capital expenditure. Accordingly, the Commission asked the generator for submission of computation of IDCs in respect of two SHPs. The Petitioner vide letter dated 21.09.2016 and further vide its mail dated 28.10.2016 provided the IDC Calculation for both the Pathri & Mohammadpur SHPs amounting to Rs. 4.97 Crore and Rs. 2.89 Crore respectively which has been taken into consideration by the Commission while arriving at the Capital Cost of the projects. Further, from the Petitioner's submission it has been observed that the loan drawn from financial institutions are Rs. 65.00 Crore & Rs. 50.46 Crore in respect of Pathri & Mohammadpur SHP respectively. Remaining balance of the capital expenditure have been considered to be utilized from equity infused by the Petitioner and grant accorded by MNRE. Since the two projects have already outlined their useful life, it has been considered that the assets have already been fully depreciated, accordingly, the same has not been considered a part of capital cost. Accordingly, overall capital expenditure incurred on the two SHPs considered by the Commission are as follows:

Breakup of Capital Expenditure considered by the Commission (Rs. Crore)

Particulars	Pathri		Mohammadpur	
	Amount (Rs. Crore)	%	Amount (Rs. Crore)	%
Capital Expenditure	110.00	100%	76.21	100%
Loan	65.00	59.09%	50.46	66.21%
Equity	32.80	29.82%	19.10	25.06%
Grant	12.20	11.09%	6.65	8.73%

3.3 Debt-Equity Ratio

3.3.1 Regulation 15(2) of the RE Regulations, 2013 regarding debt-equity ratio specifies as under:

“(2) Debt-Equity Ratio The debt-equity ratio for generic and project specific tariff shall be as follows:

(a) For generic tariff debt–equity ratio shall be 70:30.

(b) For project specific tariff, the following provisions shall apply: If the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan.

Provided that where equity actually deployed is less than 30% of the capital cost, the actual equity shall be considered for determination of tariff.

... ”

3.3.2 Based on the information provided by the Petitioner, actual equity deployed on Pathri and Mohammadpur SHP equity component is less than 30%, hence, actual equity has been considered for tariff computation.

4. Annual Fixed Charges

Since the project specific tariff is being determined in accordance with the RE Regulations, 2013, as amended from time to time, hence, capital expenditure incurred and as approved by CEA for RMU works have been considered for recovery of AFC on account of such capitalisation till the normative life of the project in accordance with the Regulations. The AFC in this regard would include depreciation, RoE, interest on loan, O&M expenses and corresponding interest on working capital based on the norms specified in RE Regulations, 2013. Determination of these components is discussed in subsequent Paras.

4.1 Depreciation

For the purpose of computation of depreciation, Regulation 17 of RE Regulations, 2013 specifies as under:

“(1) For the purpose of tariff, depreciation shall be computed in the following manner, namely:

(a) The value base for the purpose of depreciation shall be the capital cost of the project as admitted by the Commission in accordance with sub-regulation (2) below.

(b) The Salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the Capital Cost of the asset.

(c) Depreciation per annum shall be based on ‘Differential Depreciation Approach’ over loan tenure and period beyond loan tenure over useful life computed on ‘Straight Line Method’. For generic tariff

the depreciation rate for the first 12 years of the Tariff Period shall be 5.83% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 13th year onwards.

(d) Depreciation shall be chargeable from the first year of commercial operation. Provided that in case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis for computation of project specific tariff.

(2) 75% of the Capital subsidy received by the generator shall be reduced from the capital cost for depreciation purposes."

Accordingly, depreciation has been allowed up to maximum of 90% of the capital cost approved by the Commission after adjusting 75% of the capital subsidy eligible in accordance with the Regulations. The depreciation has been provided @ 5.83% per annum to provide for repayment of loan capital during the first 12 years of tariff period. Subsequently, the remaining depreciable value up to maximum of 90% of the capital cost has been spread over the remaining useful life of the project from 13th year onwards on prorata basis based on the date of completion of RMU activities. Depreciation as approved by the Commission for Pathri & Mohammadpur SHPs has been shown in enclosed **Appendix-I & II** respectively.

4.2 Return on Equity

With regard to computation of RoE, Regulation 18 of the RE Regulation, 2013 specifies as under:

"(1) The value base for the equity shall be as determined under Regulation 15(2).

(2) The Return on Equity shall be:

(a) Pre-tax 19% per annum for the first 10 years.

(b) Pre-tax 24% per annum 11th year onwards."

Accordingly, as discussed at Para 3.2.6 above return on equity on the equity deployed in the capital cost have been computed in accordance with the Regulations. The approved RoE for Pathri & Mohammadpur SHPs has been shown in enclosed **Appendix-I & II** respectively.

4.3 Interest on loan capital

Regulation 16 of RE Regulations, 2013 specifies as under:

"16. Interest on loan capital

(1) The loans arrived at in the manner indicated in Regulation 15(2) shall be considered as gross normative loan for calculation of interest on loan. The normative loan outstanding as on 1st April of

every year shall be worked out by deducting the cumulative repayment up to 31st March of previous year from the gross normative loan.

(2) For the purpose of computation of generic tariff, the normative interest rate shall be considered as average State Bank of India (SBI) Base Rate prevalent during the first six months of the previous year plus 300 basis points.

For the purpose of computation of project specific tariff, interest rate shall be considered as lower of the actual interest payable to the financial institutions or the average State Bank of India (SBI) Base Rate prevalent during the first six months of the previous year plus 300 basis points

(3) Notwithstanding any moratorium period availed by the generating company, the repayment of loan is being considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed.

While calculating project specific tariff, notwithstanding any moratorium period availed by the generating company, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed or actual repayment made, whichever is higher.

(4) Normative period of loan repayment shall be taken as 12 years."

Interest on Loan has been computed on the loan capital as determined in accordance with Para 3.2.6 above. As per regulation, in case of project specific tariff, notwithstanding any moratorium period availed by the generating company, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed or actual repayment made, whichever is higher.

Further, the interest rate has been considered as lower of the actual interest payable to the financial institutions or the average State Bank of India (SBI) Base Rate prevalent during the first six months of the previous year plus 300 basis points.

Based on the above, interest on loan capital has been calculated on the actual loan in the project which has been reduced to the extent of 75% of the capital subsidy in accordance with the Regulations. The rate of interest has been considered as 6.5% for Mohammadpur SHP being the actual rate of interest and 12.71% for Pathri SHP which is the SBI Base Rate plus 3%. Loan repayment has been considered equivalent to the depreciation allowed for each year starting from the date of completion of RMU. The approved interest on loan for Pathri & Mohammadpur SHPs has been shown in enclosed **Appendix-I & II** respectively.

4.4 Operation and Maintenance expenses

As specified in the Regulations, the base year normative operation and maintenance expense has been fixed based on the project size, as given below, and is subject to an annual escalation of 5.72% per annum for the ensuing years.

Project Size	O&M Expenses for year of Commissioning (Rs. Lakh/MW)
Upto 5 MW	26.43
>5 MW & upto 15 MW	22.73
>15 MW & upto 25 MW	19.03

Based on the above, Pathri SHP having capacity of 20.4 MW (3*6.8 MW), the O&M expenses have been considered as Rs. 19.03 lakh/MW which has been escalated for ensuing years @ 5.72% per annum upto the life of the project. Similarly, for Mohammadpur SHP having capacity of 9.3 MW (3*3.1 MW), the O&M expenses have been considered as Rs. 22.73 lakh/MW which has been escalated for the ensuing years @ 5.72% per annum upto the life of the project. O&M expenses as approved by the Commission for Pathri & Mohammadpur SHPs has been shown in enclosed **Appendix-I & II** respectively.

4.5 Interest on Working Capital

Working Capital has been calculated as per Regulations to include:

- a) Operation and Maintenance expenses for one month;
- b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on CUF envisaged in the approved DPR or normative CUF specified for the relevant technology under Chapter 5 of RE Regulations, 2013 , whichever is higher.
- c) Maintenance spare @ 15% of operation and maintenance expenses.

The rate of interest on working capital has been taken as per Regulations to be average State Bank of India Base Rate prevalent during the first six months of the previous year plus 350 basis points, which works out to be 13.21% for Pathri SHP & 13.48% for Mohammadpur SHP. Interest on working capital as approved by the Commission for Pathri & Mohammadpur SHPs has been shown in enclosed **Appendix-I & II** respectively.

4.6 Levelised RFC

The levelised Rate of Fixed Charges (RFC) has been worked out as per the Regulations as detailed below:

4.6.1 Rate of Fixed Charges (RFC) for each year has been worked out by dividing Annual

Fixed Charges by Saleable Energy for that year.

4.6.2 The levelled RFC (Rs./kWh) has been worked out by levelising the Rate of Fixed Charge for each year during the life of the project.

4.6.3 The rate of discounting taken for levelising has been worked out for each year based on the post tax weighted average cost of capital (WACC) of each year during the life of the project.

5. Tariff

5.1 Based on the above discussions, the Commission approves the levelled tariff for Pathri SHP as Rs. 1.37 per unit and for Mohammadpur SHP as Rs. 1.85 per unit considering life of both the projects as 35 years.

5.2 These tariffs have been made effective from 31st Aug 2014 for Pathri SHP & 21st July 2013 for Mohammadpur SHP being the date of completion of RMU of the SHPs and shall be valid for a period of 35 years from this date.

5.3 The differential amount on account of revision in tariff is hereby allowed to be recovered by the Petitioner through UPCL in three equal instalments commencing from first energy bill of the respective SHP after the date of issuance of this Order.

5.4 Incentive for generation beyond normative PLF

As per Regulations, the tariff for generation beyond normative PLF shall be allowed to be recovered at the project specific tariff determined by the Commission in this Order.

5.5 Other terms and conditions

Apart from the tariffs, other terms and conditions as specified in the Regulations shall apply to all the SHPs under the control of UJVN Ltd. including the duties and obligations of the generating plants specified in the Regulations.

6. The Petition is disposed off accordingly.

(K.P. Singh)
Member

(Subhash Kumar)
Chairman

Appendix I (Pathri)

Particulars	Unit	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
Year		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Installed Capacity	MW	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4
Net Generation	MU	89.89	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04
AFC																				
O&M Expenses	Rs. Lakh	227	410	434	459	485	513	542	573	606	640	677	716	757	800	846	894	945	999	
Depreciation	Rs. Lakh	343	588	588	588	588	588	588	588	588	588	588	588	296	88	88	88	88	88	88
Interest on Term Loan	Rs. Lakh	401	629	554	479	404	330	255	180	105	34	-	-	-	-	-	-	-	-	-
Interest on Working Capital	Rs. Lakh	29	64	64	64	63	63	63	63	63	63	68	70	65	63	65	68	71	74	
Return on Equity	Rs. Lakh	-	656	656	656	656	656	656	656	656	656	787	787	787	787	787	787	787	787	787
Total Fixed Cost	Rs. Lakh	1,000	2,348	2,296	2,246	2,197	2,150	2,104	2,061	2,019	1,982	2,120	2,161	1,906	1,738	1,786	1,837	1,891	1,948	
Per Unit Tariff Components																				
PU O&M Expenses	Rs. p.u.	0.25	0.27	0.28	0.30	0.31	0.33	0.35	0.37	0.39	0.42	0.44	0.46	0.49	0.52	0.55	0.58	0.61	0.65	
PU Depreciation	Rs. p.u.	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.19	0.06	0.06	0.06	0.06	0.06	0.06
PU Interest on Term Loan	Rs. p.u.	0.45	0.41	0.36	0.31	0.26	0.21	0.17	0.12	0.07	0.02	-	-	-	-	-	-	-	-	-
PU Interest on Working Capital	Rs. p.u.	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.05	0.05	
PU Return on Equity	Rs. p.u.	-	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Total Fixed PU Components	Rs. p.u.	1.11	1.52	1.49	1.46	1.43	1.40	1.37	1.34	1.31	1.29	1.38	1.40	1.24	1.13	1.16	1.19	1.23	1.26	
Levellers Tariff																				
WACC (%)		12.40%	12.53%	12.71%	12.92%	13.17%	13.48%	13.84%	14.31%	14.90%	15.65%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%
Discounting Factor	Rs./kWh	1.00	0.89	0.79	0.70	0.62	0.54	0.48	0.42	0.36	0.31	0.27	0.23	0.20	0.17	0.15	0.13	0.11	0.09	
Tariff		1.11	1.52	1.49	1.46	1.43	1.40	1.37	1.34	1.31	1.29	1.38	1.40	1.24	1.13	1.16	1.19	1.23	1.26	
Levellers Tariff	Rs./kWh	1.37																		

Particulars	Unit	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	
Year		19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
Installed Capacity	MW	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4
Net Generation	MU	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	154.04	64.15
AFC																				
O&M Expenses	Rs. Lakh	1,057	1,117	1,181	1,248	1,320	1,395	1,475	1,560	1,649	1,743	1,843	1,948	2,060	2,177	2,302	2,434	2,573	1,133	
Depreciation	Rs. Lakh	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	37
Interest on Term Loan	Rs. Lakh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on Working Capital	Rs. Lakh	77	80	83	87	91	95	99	104	109	114	119	125	131	137	144	151	159	69	
Return on Equity	Rs. Lakh	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	328
Total Fixed Cost	Rs. Lakh	2,008	2,072	2,140	2,211	2,286	2,366	2,450	2,539	2,633	2,732	2,837	2,948	3,066	3,190	3,321	3,460	3,607	1,567	
Per Unit Tariff Components																				
PU O&M Expenses	Rs. Lakh	0.69	0.73	0.77	0.81	0.86	0.91	0.96	1.01	1.07	1.13	1.20	1.26	1.34	1.41	1.49	1.58	1.67	1.77	
PU Depreciation	Rs. Lakh	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
PU Interest on Term Loan	Rs. Lakh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PU Interest on Working Capital	Rs. Lakh	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.11	
PU Return on Equity	Rs. Lakh	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Total Fixed PU Components	Rs. Lakh	1.30	1.35	1.39	1.44	1.48	1.54	1.59	1.65	1.71	1.77	1.84	1.91	1.99	2.07	2.16	2.25	2.34	2.44	
Levellers Tariff																				
WACC		16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%	16.31%
Discounting Factor	Rs./kWh	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Discounted Tariff		1.30	1.35	1.39	1.44	1.48	1.54	1.59	1.65	1.71	1.77	1.84	1.91	1.99	2.07	2.16	2.25	2.34	2.44	
Levellers Tariff	Rs./kWh																			

Appendix II (Mohammadpur)

Particulars	Unit	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Year		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Installed Capacity	MW	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
Net Generation	MU	44.73	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27
AFC																			
O&M Expenses	Rs. Lakh	147	223	236	250	264	279	295	312	330	349	369	390	412	436	461	487	515	544
Depreciation	Rs. Lakh	289	415	415	415	415	415	415	415	415	415	415	415	169	62	62	62	62	62
Interest on Term Loan	Rs. Lakh	199	263	230	177	112	42	3	-	-	-	-	-	-	-	-	-	-	-
Interest on Working Capital	Rs. Lakh	19	37	37	36	35	35	35	36	37	38	40	42	37	36	37	39	40	42
Return on Equity	Rs. Lakh	-	382	382	382	382	382	382	382	382	382	458	458	458	458	458	458	458	458
Total Fixed Cost	Rs. Lakh	655	1,321	1,300	1,261	1,209	1,154	1,130	1,145	1,164	1,184	1,283	1,305	1,077	992	1,018	1,046	1,075	1,107
Per Unit Tariff Components																			
PU O&M Expenses	Rs. p.u.	0.33	0.35	0.37	0.39	0.41	0.43	0.46	0.49	0.51	0.54	0.57	0.61	0.64	0.68	0.72	0.76	0.80	0.85
PU Depreciation	Rs. p.u.	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.26	0.10	0.10	0.10	0.10	0.10
PU Interest on Term Loan	Rs. p.u.	0.45	0.41	0.36	0.28	0.17	0.07	0.00	-	-	-	-	-	-	-	-	-	-	-
PU Interest on Working Capital	Rs. p.u.	0.04	0.06	0.06	0.06	0.06	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07
PU Return on Equity	Rs. p.u.	-	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Total Fixed PU Components	Rs. p.u.	1.46	2.06	2.02	1.96	1.88	1.79	1.76	1.78	1.81	1.84	2.00	2.03	1.68	1.54	1.58	1.63	1.67	1.72
Levellised Tariff																			
WACC (%)		9.42%	9.67%	10.09%	10.94%	12.54%	15.61%	18.85%	19.15%	19.15%	19.15%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%
Discounting Factor	Rs./kWh	1.00	0.91	0.83	0.75	0.66	0.57	0.48	0.41	0.34	0.29	0.24	0.20	0.17	0.14	0.12	0.10	0.08	0.07
Tariff		1.46	2.06	2.02	1.96	1.88	1.79	1.76	1.78	1.81	1.84	2.00	2.03	1.68	1.54	1.58	1.63	1.67	1.72
Levellised Tariff	Rs./kWh	1.85																	

Particulars	Unit	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
Year		19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Installed Capacity	MW	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
Net Generation	MU	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	64.27	19.55
AFC																			
O&M Expenses	Rs. Lakh	575	608	643	680	719	760	803	849	898	949	1,003	1,061	1,121	1,186	1,253	1,325	1,401	450
Depreciation	Rs. Lakh	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	19
Interest on Term Loan	Rs. Lakh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on Working Capital	Rs. Lakh	44	46	47	49	52	54	56	59	62	64	67	70	74	77	81	85	89	28
Return on Equity	Rs. Lakh	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	458	139
Total Fixed Cost	Rs. Lakh	1,139	1,174	1,211	1,250	1,291	1,334	1,380	1,428	1,480	1,534	1,591	1,652	1,716	1,783	1,855	1,931	2,011	637
Per Unit Tariff Components																			
PU O&M Expenses	Rs. Lakh	0.90	0.95	1.00	1.06	1.12	1.18	1.25	1.32	1.40	1.48	1.56	1.65	1.74	1.84	1.95	2.06	2.18	2.30
PU Depreciation	Rs. Lakh	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
PU Interest on Term Loan	Rs. Lakh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PU Interest on Working Capital	Rs. Lakh	0.07	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.12	0.13	0.13	0.14	0.15
PU Return on Equity	Rs. Lakh	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Total Fixed PU Components	Rs. Lakh	1.77	1.83	1.88	1.94	2.01	2.08	2.15	2.22	2.30	2.39	2.48	2.57	2.67	2.77	2.89	3.00	3.13	3.26
Levellised Tariff																			
WACC		19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%	19.41%
Discounting Factor	Rs./kWh	0.06	0.05	0.04	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Discounted Tariff		1.77	1.83	1.88	1.94	2.01	2.08	2.15	2.22	2.30	2.39	2.48	2.57	2.67	2.77	2.89	3.00	3.13	3.26
Levellised Tariff	Rs./kWh																		