Before

UTTARAKHAND ELECTRICITY REGULATORY COMMISSION

Petition No. 20 of 2014

In the matter of:

Petition for approval of "Capital Investment for Renovation & Modernization" of Khatima (3x13.8 MW) HEP of UJVN Ltd.

And

In the matter of:

UJVN Limited Dehradun ...Petitioner

Coram

Shri Subhash Kumar	**Chairman**
Shri C.S. Sharma	**Member**
Shri K.P. Singh	**Member**

Date of Order: May 07, 2015

ORDER

This Order relates to the Petition filed by UJVN Ltd. (hereinafter referred to as "UJVN Ltd." or "the Petitioner") under Regulation 25 of UERC (Terms and Conditions for Determination of Tariff) Regulation, 2011 for seeking approval of the Capital Investment for Renovation & Modernization (R&M) of 3 x 13.8 MW Khatima HEP.

2. UJVN Ltd. vide letter No. 5463/UJVNL/MD/U-6 dated 06.09.2013 had filed an Application/Petition under Regulation 25 of UERC (Terms and Conditions for Determination of Tariff) Regulation, 2011 for seeking approval in the matter of Capital Investment for Renovation & Modernization (R&M) of 3 x 13.8 MW Khatima HEP.

3. In the said Petition UJVN Ltd. has submitted that:

   (1) The 3x13.8 MW Khatima HEP is an irrigation canal based project. The project is situated at Lohiahead (Khatima).

(2) The Power house units were commissioned in year 1955 & 1956. There are 3 Hydro Generator machines of 13.8 MW each of English Electric make with total aggregate plant capacity of 41.4 MW.

(3) All the 3 units of the Khatima Power Station are in continuous operation since commissioning for more than last 57 years. Normally the life of hydro power plant is 30-35 years after which it requires renovation.

(4) Underwater parts of all 3 units were renovated by BHEL during 1979 to 1983. Renovation of underwater parts brought back the capacity of the turbines to rated capacity but due to continuous operation during last 30 years the capacity of the units have deteriorated due to change in profile of runner blades, hub & runner cone. Extensive damages have been observed in runner blades & envelope during shutdown inspection of all the 3 units, due to which the generation capacity of machine have come down to 20-25 MW against rated capacity of 41.4 MW and the average yearly generation of the power station for last 3 years came down to 149.03 MUs. Besides above the governors, excitation system, generators and turbines including auxiliaries, protection system & control equipments have become very old and obsolete. Due to obsolescence of equipments, the non-availability of spares is also a day to day problem. In view of the above facts the renovation & modernization of the hydro generating machines including auxiliaries and other associated equipments/system of Khatima HEP has become necessary.

(5) The RLA & LE studies for E&M and Hydro Mechanical systems was carried out by M/s MECON Limited, Ranchi & report was submitted by them in October 2004. Study of civil works was carried out by Er. N. Mishra, Member, CEET. Based on the reports, original Detailed Project report (DPR) for renovation & modernigation of 3x13.8 MW Khatima HEP was prepared in-house in November 2007.

(6) The cost of E&M and Hydro Mechanical works was taken on the basis of report submitted by M/s MECON in year 2004.

(7) Further considering the facts that Sharda canal and its distribution/regulation is under control of Irrigation Department of Govt. of Uttar Pradesh and hence construction of a new bye-pass channel & increasing the capacity of existing Nagla Escape channel involves interstate works which create complications in execution and could have taken much longer time. Therefore, due to the reasons revised DPR for R&M of Khatima Power House was prepared only for restoring the existing capacity of the units along with necessary modifications and repair of civil structures.

(8) After execution of the project in accordance with revised DPR, the project is expected to generate 41.4 MW power with average generation of 235.59 MU in 90% dependable year.

(9) In revised DPR comprehensive Renovation & Modernization of the 3x13.8 MW Khatima HEP to achieve the increase in generation to the level of rated capacity of the plant and to extend the life of the plant further up to next 35 years, has been proposed.

(10) The total cost of renovation & modernization works of 3x13.8 MW Khatima HEP proposed was estimated at Rs. 25676.54 Lacs as per details mentioned under:

S. No.	Item	Cost
A	Work	
1.	Preliminary	95.00
2.	Civil & Hydro Mechanical Works	4338.69
3.	Maintenance @1% of Civil Works	43.39
4.	Power Plant & Accessories (E&M)	15952.42
	Total A-Works	**20429.49**
B	Estiblishment @4% of Civil Works & E&M (Being on R&M project)	817.18
C	Ordinary T&P @ 1% of A-Works	204.29
D	Losses on stocks @0.25% Civil Works	6.87
E	Receipt and recoveries	-79.00
	Total Direct Charges	**21378.84**
F	Indirect Charges (Audit & Account @1% of A-Works)	204.29
	Grand Total	**21583.13**
	IDC	4093.42
	Total Cost Including IDC	**25676.55**

(11) The project is being financed with the Debt: Equity Ratio of 70:30. Equity will be provided from budgetary support of GoU envisaged for Petitioner while debt has been arranged from Power Finance Corporation of India. The year-wise allocation of debt and equity as proposed in the Business Plan submitted with UERC is reproduced in the table below:

Year	Upto 31.03.2013	FY 2013-14	FY 2014 -15	FY 2015-16	After 31.03.2016	Total
Debt	34.58	58.99	42.57	18.16	-	154.31
Equity	14.82	25.28	18.24	07.78	-	66.13

(12) The chronological order of dates in respect of award of order/contract is as under:

(a) NIT for E&M and Hydro mechanical works was published in newspapers on 25.02.2011.

(b) Part-I was opened on 21.07.2011 and price bid (part-II) was opned on 21.10.2011.

(c) Letter of intent issued on 12.12.2011 to Joint Venture of M/s Alstom (India) Pvt., Vododara and M/s PES Engineers Pvt. Ltd., Hyderabad and contract was signed on 03.01.2012.

(d) R&M of Unit-1 started on 01.10.2012.

(13) The contract was awarded to Joint Venture (JV) of M/s Alstom Projects (India) Ltd. Vadodara and M/s PES Engineers Pvt. Limited, Hyderabad on Turnkey basis. The estimated cost of R&M works was Rs. 256.77 Crore as per revised DPR which was prepared in house for E&M, Hydro-mechanical & Civil works. The order was placed as per rates received against tender for E&M and Hydro-mechanical works at a cost of Rs. 115.11 Crore from the JV of above firms.

(14) The completion schedule for Renovation & Modernization works of various units of 3x13.8 MW Khatima HEP is as under:

Unit No	Start date	Completion date
Unit I	01.10.2012	31.03.2014
Unit II	01.04.2014	31.01.2015
Unit III	01.01.2015	31.10.2015

4. The Application/Petition was examined and preliminary deficiencies were sent to UJVN Ltd. vide letter No. 1245 dated 11.12.2013 for submitting the desired information/justification, which are as follows:

"1. UJVN Ltd. to justify the need of proposed capital expenditure towards RMU of the plant and submit the relevant investigation reports justifying the need of each activity to be carried out under Renovation & Modernization works. UJVN Ltd. should also justify the basis of assessment of proposed CAPEX.

2. *The average existing generation capacity of Khatima HEP as submitted by UJVN Ltd. is 31.6 MW against the rated capacity of (3X13.8 MW) 41.4 MW and through RMU, UJVN Ltd. intends to attain the rated capacity of (3X16 MW) 48 MW, for which the estimated cost is Rs 115.112 Crore. However, basis of capital cost of each element namely E&M , Hydro-Mechanical and civil works has not been provided. Therefore, UJVN Ltd. should submit the basis for these capital cost.*
3. *After incurring a cost of Rs 115.112 Crore , increase in generation envisaged after RMU as submitted by UJVN Ltd., is 85.12 MU which works out to an increase of around 50.8% with respect to the existing generation. In this regard details of month-wise generation of plants which have undergone RMU like Pathri, Mohammadpur and Galogi post RMU period and pre RMU period for atleast past 3 years alongwith the generation figures proposed in the DPR.*
4. *UJVN Ltd. is required to submit the relevant document assuring it that Govt. of Uttarakhand is ready to provide 30% equity.*
5. *UJVN Ltd. is required to submit detailed Cost Benefit Analysis along with payback period of the capital cost of Renovation and Modernization works.*
6. *The C.D.M. benefits to be received should be accounted for calculation of post RMU Cost Benefit Analysis."*

5. In response, UJVN Ltd. vide its letter 03.01.2014 submitted its reply on the above deficiencies and sought time from the Commission vide letter dated 10.02.2014 for making the Power Point Presentation. The Commission allowed UJVN Ltd. to make the Power Point Presentation on 18.03.2014.

6. The Petition was further examined and the observations were forwarded to UJVN Ltd. vide letter No. 1140 dated 17.09.2014 for information and comments.

(i) *Generation capacity and annual generation before RM are 20-25 MW and 144.92 MU respectively which are expected to increase to 41.4MW (by 65.6%) and 235.59 MU by (62.49%) are considered suitable. The benefit-cost ratio for the RM works out to be 1.31 which is greater than 1.*

(ii) *Investment approval for RM of Khatima PS is recommended to be considered for approval, at an estimated cost of Rs. 166.6278 Crore excluding IDC at June 2011 price level.*

(iii) *This Cost is likely to go up further as the execution period for RM of E&M and HM works is now planned to be 4 years compared to 3 years considered in the DPR also civil works are yet to be awarded.*

(iv) *Further, as estimate for Civil works are rather old, originally worked out in 2004-05, 2010 or are on lump sum basis, these should be estimated afresh based on applicable Schedule of Rates before inviting tenders.*

7. UJVN Ltd. vide its letter no. 8834 dated 17.10.2014 submitted its comments which are being reproduced hereunder:

"*1. The RMU activities of Khatima HEP have already started with handing over of Unit-I on 1st Oct. 2012. After dismantling of Unit-1 and quality checks, the Contractor, JV of M/s Alstom India Ltd. & M/s PES Engineers Pvt. Ltd. had submitted a Detailed Report regarding condition of various components/equipments along with recommendation for replacement of various parts/components based on quality reports. On its basis Detailed Order for additional/extra items amounting to Rs. 9.59 Cr. Has been placed with Contractor on dated 21-02-2014. However, the replacemnt of diffusers was deferred as this was not hampering the overall progress of RMU and is now being taken up separately.*

The Cost of Design, Manufacture and Supply of 6 nos. of Diffusers (two numbers for each of the three Units) os a[[rpx. Rs/ 20.00 Crore excluding local taxes and duties.

M/s Power Finance Corporation (PFC), the funding agency, has been informed about this and the Quarterly Drawl Schedule of Loan includes the additional order dated 21.02.2014 for Rs. 9.59 Crore + approx. 20% price variation + approx. Rs. 20

Crore for new diffuser valves + Rs. 30 Crore for Civil Works as per 2010 base price. Civil Works under the control of U.P. Irrigation Department have been considered in the year 2014-15 and 2015-16, whereas diffusers have been considered in the year 2015-16.

2. *In addition to above mandatory CEA requirement for installation of Bus-Bar protection system has come up which will have additional financial burden and some other equipment/components may be required in near future during RMU of the project.*
3. *The Canal, Switchyard, Roads & Power House equipment etc. at Khatima HEP have been damaged due to the incident of breaching of Right Bank Canal near fore-bay on 31st August 2014. The preliminary estimated restoration cost is approx. Rs. 25.73 Crore.*
4. *The RMU works at Khatima HEP are in progress and the project cost may increase or decrease depending on the requirement of additional items and the price variation. The exact figures can only be intimated after finalization of the cost. Moreover, the completion schedule of the Units is likely to be delayed due to damage cause due to incident of breaching canal on 31st August 2014 and thus, the cost may further go up."*

8. Further, in order to compare the proposed cost for RMU of Khatima HEP with the other comparable Generating Plants in the Country, the Commission advised UJVN Ltd. to conduct a study with respect to the scope of work-wise cost breakup, where such R&M activities has either been conducted or being carried out. The Petitioner was also advised to refer the documents/website of CEA etc.

9. The Petitioner conducted a study on the suggested lines and submitted a report vide letter No. 125 dated 12.03.2015 on the basis of information available on CEA website and also referred the documents of CBIP. The Petitioner, in this regard, submitted that six Nos. HEPs appearing similar to Khatima HEP namely Bassi (4x15 MW), Chenani (4x6.6 MW), Sumbal Sindh (2x11.3 MW), Poringal Kuthu (4x8 MW), Hira Kud (2x37.5 MW) and Umiam (2x9 MW) were identified from the CEA documents, however, on going through the detailed features and comparing the parameters, it was found that there was no similarity in head,

discharge and type of turbine etc., hence no conclusions can be drawn from the above comparison. Therefore, other similar Hydro Projects namely Hampi (4x9 MW), Pochampad (3x9 MW), Bhadra (2x12 MW) and Matatila (3x10.2 MW) were identified on the basis of type of Turbine from the CBIP Publications, however, on further analysis, it was found that these Plants have not undergone extensive R&M.

The Petitioner in the aforesaid report also submitted that:

(1) The scope of work under R&M Khatima HEP is much more exhaustive than the R&M of any other HEP mentioned in CEA website. This project has low head & high discharge where Kaplan turbines have been installed as per the design & technology of British era.

(2) R&M works of Khatima incorporated complete replacement of turbine, generator & BOPs and also included replacement of other underwater parts. Bids were invited through open tendering (National Competitive Bidding) and accordingly the contract for E&M and HM works was awarded to the L1 bidder i.e. JV of M/s Alstom India Ltd. & M/s PES Engineers Pvt. Ltd.

(3) The cost of electro-mechanical equipments increases with decrease in the head. This is because the size of the electro-mechanical equipments increase with decrease in the head. That is for high head HEPs cost of electro-mechanical equipments will be less as compared to the small head HEPs for the same capacity.

(4) After execution of R&M in accordance with the DPR, the project will generate 41.4 MW (with 10% continuous overload capacity for individual mechanics) with an average annual generation of 235.59 MU in 90% dependable year, which before R&M was 149.03 MU as per DPR. Hence, the Petition has been submitted to approve the DPR for the cost of Rs. 215.83 Crore without IDC and Rs. 256.77 Crore including IDC.

Commission's View

10. The Commission observed that the chronology submitted with respect to the

processing of contract for RMU works is during the period when UERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations, 2004, was applicable. In the said regulations the Petitioner was not required to obtain approval of RMU works. The requirement of investment approval for RMU was introduced by the Commission in the UERC (Terms & Conditions for Determination of Tariff) Regulations, 2011, which came into force from 01.04.2013. And the said Petition has been filed under Regulation 25 of UERC (Terms & Conditions for Determination of Tariff) Regulations, 2011.

Further, the above Regulation 25 stipulates that:

"25.Renovation and Modernisation

(1) *The generating company or the transmission company, as the case may be, for meeting the expenditure on renovation and modernization (R&M) for the purpose of extension of life beyond the useful life of the generating station or a unit thereof or the transmission system, shall make an application before the Commission for approval of the proposal with a Detailed Project Report giving complete scope, justification, cost-benefit analysis, estimated life extension from a reference date, financial package, phasing of expenditure, schedule of completion, reference price level, estimated completion cost including foreign exchange component, if any, record of consultation with beneficiaries and any other information considered to be relevant by the generating company or the transmission company:*

Provided that in case of coal-based/lignite fired thermal generating station, the generating company, may, in its discretion, avail of a 'special allowance' in accordance with the norms specified in Regulation 25 (4), as compensation for meeting the requirement of expenses including renovation and modernisation beyond the useful life of the generating station or a unit thereof, and in such an event revision of the capital cost shall not be considered and the applicable operational norms shall not be relaxed but the special allowance shall be included in the annual fixed cost:

Provided also that such option shall not be available for a generating station or unit for which renovation and modernization has been undertaken and the expenditure has been admitted by the Commission before commencement of these regulations, or for a generating station or unit which is in a depleted condition or operating under relaxed operational and performance norms.

(2) *Where the Generating Company or the Transmission Company, as the case may be, makes an application for approval of its proposal for renovation and modernisation, the approval shall be granted after due consideration of reasonableness of the cost estimates, financing plan, schedule of completion, interest during construction, use of efficient technology, cost-benefit analysis, and such other factors as may be considered relevant by the Commission.*

(3) *Any expenditure incurred or projected to be incurred and admitted by the Commission after prudence check based on the estimates of renovation and modernization expenditure and life extension, and after deducting the accumulated depreciation already recovered from the original project cost, shall form the basis for determination of tariff.*

..."

11. In accordance with the provision in Regulation 25(2) above, the approval for the proposal of Renovation and Modernisation is to be granted after consideration of reasonableness of the cost estimates, financing plan, interest during construction, use of efficient technology, cost benefit analysis or other relevant factors etc.

The Commission observed that *prima-facie* the proposed cost estimate of RMU of Khatima HEP appears to be on higher side as per MW cost w.r.t. the total proposed cost works out to Rs. 6.2 Crore/MW, and per MW cost for electromechanical and hydro-mechanical works, worked out to more than Rs. 4.5 Crore. It was in this context that the Petitioner was advised to ascertain Cost incurred on similarly situated HEPs and furnish details. However, the Petitioner could not come up with the details sought.

12. The Commission is of the view that the related works have already been started and as per schedule submitted to the Commission, the works are nearing completion. The Commission, however agrees, in-principle, for carrying out RMU works of this HEP.

13. The Petitioner is directed to come up for determination of allowable Cost in tariff after completion of RMU of the Plant and when the actual Cost incurred is known. The Petitioner is also directed to ascertain comparable work done

elsewhere either in RMU or new Power Station and Cost incurred thereon to establish reasonableness of Cost incurred.

The Petition stands disposed off.

Ordered accordingly.

(K.P. Singh)	(C.S. Sharma)	(Subhash Kumar)
Member	**Member**	**Chairman**