

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 81/MP/2022

Coram:

**Shri I.S Jha, Member,
Shri Arun Goyal, Member
Shri Pravas Kumar Singh, Member**

Date of Order: 20th September, 2023

In the matter of

Miscellaneous Petition under section 79 of the Electricity Act, 2003 read with Regulations 9(2) and 27 (1) of the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations, 2019 for approval of proposed additional capitalization on account of renovation modernization and up-rating (RM&U) in respect of Unit- 1 (40 MW) of existing Panchet Hydel Power Station (PHS) Unit 1 & 2 (2x40 MW).

And

In the matter of

Damodar Valley Corporation,
DVC Towers, VIP Road,
Kolkata-700054.

.....**Petitioner**

Vs

1. West Bengal State Electricity Distribution Company Limited,
2. Jharkhand Bijli Vitran Nigam Limited

.....**Respondents**

Parties present:

Shri Venkatesh, Advocate, DVC
Shri Ashutosh K Srivastava, Advocate, DVC
Shri Siddharth Nigotia, Advocate, DVC
Shri Samit Mandal, DVC



ORDER

The Petitioner, Damodar Valley Corporation (DVC) has filed the present petition seeking the following reliefs:

- a) *Admit the present Petition;*
- b) *Allow 'In-principle' approval for Renovation Modernization and Uprating (RM&U) and life extension proposal of Unit No.1 of PHS at the total cost of Rs. 12,452.48 Lakhs may be accorded;*
- c) *Allow the revised design energy of the Panchet Hydel Power Station (PHS) Unit Nos.1 & 2 i.e., 197.25 MU;*
- d) *Allow shutdown period required for RM&U at Projects as Deemed Availability for payment of Capacity Charges;*
- e) *Allow to recover expenses from the beneficiaries during RM&U activities concurrently with generation in terms of O&M expenses and interest on loan as per proviso under Regulation 42(2) of CERC Tariff Regulation 2019; and*
- f) *Pass such further Order / Orders as this Hon'ble Commission may deem just and proper in the facts and circumstances of the case.*

Background

2. Petitioner's power station, Panchet Hydel Power station (PHS) having two units i.e., unit No.1 and Unit No.2 of capacities 40 MW each were put on commercial operation (COD) in December 1959 and March 1991 respectively. Unit No.1 had completed its useful life in December 1999 which is 40 years from COD in terms of Regulations 3(73) of the Tariff Regulations 2019.

3. On 10.06.2003, the Electricity Act, 2003 (Act) came into force, *inter alia*, with the following objectives: -

- (a) To take measures conducive to development of electricity industry.
- (b) To promote competition.
- (c) To protect interest of consumers.
- (d) To rationalize the electricity tariff.



4. On 07.08.2013, the Commission vide Order in Petition No. 272/GT/2012 determined the annual fixed charges based on actual additional capital expenditure for the years 2009-10 and 2010-11 and projected additional capital expenditure for the years 2011-12, 2012-13 and 2013-14.

5. Since September 2013, Unit No. 1 of PHS was operating at a low load due to the high temperature of stator bar and loading was further restricted to 25 MW from July 2016 onwards.

6. On 29.07.2016, the Commission vide Order in Petition No. 467/GT/2014 had revised the annual fixed charges of the generating station for the period 2009-14 after trueing-up exercise in terms of Regulation 6(1) of the Tariff Regulations 2009.

7. The annual fixed charges determined vide orders dated 07.08.2013 and 29.07.2016 are subject to the final outcome of the Civil Appeals pending before the Supreme Court in respect of the determination of tariff of the generating stations and inter-state transmission systems of the Petitioner by the Commission for the periods 2006-09 and 2009-14.

8. Commission, vide order dated 20.09.2016, had determined the tariff for PHS Unit Nos. 1 and 2 (80 MW) for the tariff period 2014-19 in Petition No. 353/GT/2014.

9. Additionally, vide Petition No. 566/GT/2020, the Petitioner had also filed a Tariff Petition for True-up for the period of 2014-19 and determination of Tariff for the period of 2019-24 before this Commission. The same has been disposed of by the Commission on 28.2.2023.



10. On 11.05.2018, the Petitioner issued a Letter of Assurance (LOA) bearing No. EDCON/ENGG/PHS/RLA U#1/1330 to MECON Limited to carry out the necessary RLA Study, preparation of Detailed Project Report (DPR), preparation of tender documents and assisting in finalization of vendor for executing Renovation and Modernisation (R&M) / Renovation Modernization & Up-rating (RM&U) and LE job for Unit No.1 of PHS along with its auxiliaries of PHS.

11. On 30.05.2018, a team of MECON Limited's engineers visited Unit No.1 of PHS to run various tests, in-site examination and on-the-spot study of the various plant systems, hydrology etc.

12. On 30.07.2018, Unit No.1 of PHS was handed over to MECON Limited. Subsequently, in August 2018, MECON Limited carried out Non-Destructive Tests (NDT) for its Residual Life Assessment (RLA) study. From 06.08.2018 till 03.09.2018, the Unit No.1 of PHS was reassembled.

13. In the month of November 2018, based on NDT, run test of equipment and after a discussion of the same with the O&M personnel of the Petitioner, MECON limited submitted its RLA & Up-rating study report. The outcome of RLA and up-rating study report is used as the basis for preparation of DPR.

14. On 25.06.2019, the DPR for carrying out the RM&U of PHS for its life extension was approved by the Petitioner's Board of Directors (BOD) *vide* the Resolution bearing No. 8897.



15. On 03.02.2021, Central Electricity Authority (CEA) vide its letter No. 13/2(DVC)2020 /HE&RM/CEA/ 73 (dated 03.02.2021) approved the design energy of 105.50 MUs for Unit No.1 of the PHS by the weighted averaging method.

16. In light of the aforementioned facts and circumstances, the Petitioner has filed the present Petition before this Commission.

Submission by the Petitioner

17. It is submitted that this Commission has the requisite jurisdiction adjudicate over the present Petition Section 79(1) (b) of the Act under which this Commission has the power to regulate the tariff of the Petitioner.

18. Petitioner has preferred the present Petition on the following grounds: -

A. Need for Renovation, Modernization & Up-rating: Unit No.1 of PHS is causing revenue loss to the Petitioner and requires urgent RM&U of the generating station for the following reasons:

- a. With more than 60 years of running, Unit No.1 of PHS has outlived its fair technical life and its performance has deteriorated. The unit (with deteriorated capacity) has been kept in service with regular maintenance. However, the Commission vide Tariff Order no. 353/GT/2014 dated 20.09.2016 has approved the design energy of 237 Mus for Unit No.1 and Unit No.2 of PHS. Further, PHS utilizes water from the Panchet Dam, level of which is maintained by barrage on Damodar River.
- b. Availability of water and water-head for generation of power at Unit No. 1 has been assessed based on the water flow through Powerhouse and spillway. Data for



Panchet Generating station from the financial year 1997-98 to 2017-18 (21 years) has been considered for above purpose.

- c. Based on the power potential study, considering the monthly reservoir level and the monthly energy generation of powerhouse, the weighted average reservoir level has been estimated as 409.533 ft (124.82 m) for entire year of PHS. Hence, from the design point of view, the lower value i.e., 409.53ft (124.82m) has been considered as weighted average of Reservoir level for further calculation.
- d. On comparing with last five (5) financial years average annual energy generation for the period 2013-14 to 2017-18 is 41.39 MUs against average annual energy generation for the period of 1997-98 to 2017-18 years i.e., 73.735 MUs, it is evident that there is substantial decrease in energy generation of the Unit No.1 in recent years.
- e. In terms of the letter dated 03.02.2021 by the CEA, the design energy is 105.50 MUs for Unit No.1 of PHS as against the existing average annual generation for last 21 years of 67.83 MUs which is based upon the available flow & head of Station.
- f. DPR for carrying out RM&U of Unit No.1 of PHS for its life extension was duly approved by the Petitioner's BOD wherein, it recommended the Petitioner to accept the DPR for RM&U work instead of R&M work.

B. Scope of RM&U works and Justification: Complete scope of RM&U works with Justification has been deliberated under the DPR. The highlights of proposal are as under:



- a. Overall time for the RM&U project is estimated to be 17 months from “Zero-Date”. The “Zero-Date” of the project is reckoned as the date of award of contract on EPC Contractor.
- b. The RM&U activities of the PHS and generation of power would be concurrent. In terms of the DPR, a complete shutdown of the powerhouse is not envisaged whereas shutdown of Unit No.1 of PHS is estimated to be around 9 months. However complete shutdown, if necessary, would be taken temporarily. Time frame of actual shutdown of the Unit No.1 of PHS will be submitted before this Commission in due course of time.
- c. After RM & U of Unit No.1 of PHS, likely Up-rated capacity of Unit No.1 of PHS is estimated to be 46 MW. Estimated annual energy generation of Unit No.1 of PHS of PHS is 105.50 MUs considering similar pattern of water availability data for power generation as in the last 21 financial years i.e. from 1997-98 to 2017-18 and increase in efficiency of the uprated turbine & generator. The average annual generation of Unit 1 for last 21 years has been 67.83 Mus.
- d. Further, the Energy benefit (net energy at bus bar) has been estimated as 37.21 MUs during a year (as approved by CEA *vide* letter no: 13/2(DVC) 2020 /HE&RM/CEA/ 73 dated 03.02.2021).

19. **Schedule of completion of RM&U works:** Schedule of completion of RM&U works has been detailed in DPR, which establishes the complete scope of RM&U works with justification:



- a. **Water Conductor System (penstock, spiral casing draft tube):** Repair/ refurbishment/ strengthening of Water Conductor System from Panchet Dam to draft tube, replacement of penstock drain valve with electric motor operation, cleaning of mud and rust, corroded surface or damaged weld surface of the spiral casing, replacement of all drain valves, pressure gauges, manhole seals, etc. of spiral casing. Refurbishment of draft tube including manhole.
- b. **Turbine and Associated Equipment:** Replacement of wicket gates with new ones, refurbishment of stay vanes, replacement of runner and hub, replacement of turbine shaft & coupling bolts, replacement of turbine guide bearing, replacement of shaft seal, replacement of complete governing system along with compressors, pumps, wicket gate servomotors and runner blade servomotor, replacement with a new governing system of digital PID type with provision of RGMO (restricted governor mode operation) including new oil pressure unit system with piping, valves, instruments etc., servomotors for regulation of wicket gates and runner blades.
- c. **Generators and Associated Equipment:** Replacement with new stator for up-rated capacity of 46 MW consisting of stator frame, core and stator winding of class 'F' insulation, Lamination of stator core of high grade non ageing cold rolled steel coated with suitable insulation, new rotor consisting of shaft, spider, rim, and poles with field and damper winding. Insulation class of field winding to be of class 'F'. Coupling with new bolts, replacement of the upper & lower bracket, replacement with new set of guide bearings & thrust bearing consisting of thrust pads, thrust collar, oil reservoir with internal/ external cooler etc., positioning of new generator air coolers along with new CO2 based generator



fire-fighting system consisting of CO2 cylinder bank, ring headers, discharge nozzles, thermostatic temperature detectors etc. Addition of new generator braking and jacking system along with new static excitation system with digital AVR having two control channels. A digital AVR through auto synchroniser.

- d. **Protection and Control System:** Micro-processor based numeric relays with built in test facilities for generator, auxiliaries, generator transformer and others to be provided to have better response and a high degree of accuracy. DCS/ PLC based control system is to be provided for complete monitoring and control of the Unit including replacement of Hydraulic governor controller, renovation of control room with requisite Air-conditioning, illumination and false ceiling, for ensuring a dust free environment at optimum temperature, Reservoir water level measurement system augmented with DCS/ PLC, implementation of Turbine supervisory instrumentation (TSI) system and vibration monitoring system including \sensors, transmitters, converters, limit value monitors, measuring and amplifying modules, power supplies etc. All the field mounted instruments (for temperatures, pressures, differential pressure, level & flow) for measurement & control, thermocouples, RTDs, switches, transmitters, local gauges etc. to be replaced using up to date microprocessor-based field instruments. Replacement of Annunciation system by microprocessor-based annunciation system with window facia, alarm hooters etc. Replacement with new UPS system including Battery, Battery charger, Distribution board etc. and Replacement of all old instrument cables, signal & control cables and cable trays.



- e. **Transformers and Electrics:** Refurbishment of Generator Transformer with additional capacity to take up the load of up-rated machine. New cast resin dry type 11/0.415 kV, 750 kVA, AN Unit Aux. transformer to be added, Station Reserve transformer to be replaced with new 3 phase, 11/0.415 KV, 750 KVA, ONAN transformer. Replacement of existing Neutral Grounding Transformer with Resistor with new one. Generator CTs, PTs and LAs to be replaced with new ones of proper ratio, burden and accuracy to match with latest meters and numerical protection system. Addition of new overhead busduct to suit the up-rated unit machine, Replacement of Generator Disconnecting Switch with new Vacuum circuit breaker and new LT AC Distribution board comprising of Unit Auxiliary Board as well as Station Auxiliary Board. Battery Chargers along with Auto Change over switch and DCDB shall be replaced with new one. UPS System along with chargers, inverter and battery banks. Replacement of HT Cables, LT Power cables, control cables etc. The powerhouse and Transformer yard illumination system to be upgraded. New Push button stations near generator transformer and for local control of each drive/ mechanism are to be added.
- f. **Common Facilities:** Replacement of Entire cooling water system including pipe, valves, strainer, cooler. Addition of a new portable type oil centrifuge of adequate capacity and of latest design. Replacement of head covers, drainage pumps, piping, water level detection instrument, dewatering pumps (03 nos.), piping, valves, water level floats with interlocks. Refurbishment of Drainage and dewatering system with replacement of pipes and fittings. Fire Detection and Alarm System will be intelligent addressable microprocessor based automatic



system. Addition of High velocity water spray for generator transformer along with different types of portable fire extinguishers for various areas of the station.

R&M of EOT Crane, new package type A/C system for Control room etc.

- g. **Civil Works:** Complete removal of the bottom cover of the beam and redo with micro concrete. Column cracks repairing and filling with epoxy grouts. Modification / construction of foundation & structure for busduct of Unit No.1 of PHS along with modification of control room to suit new DCS/PLC system.

C. The life extension of Unit No.1 of PHS after the completion of R&M works

20. The useful Life of the power station is estimated to be 40 years after completion of R&M works as per DPR.

D. Expenditure to be incurred for the purpose of RM&U works

21. As per Revised Chapter- 13 of the DPR (Volume-I), the estimated impact because of RM&U of Unit No.1 of PHS are as follows:

- a. **Estimated completion cost:** The estimated completion cost of proposed Renovation Modernization & Up-rating (RM&U) of PHS is Rs. 12452.48 Lakhs including Interest during Construction (IDC) of Rs. 490.37 Lakhs. Debt - Equity ratio for the capital expenditure considered as 70:30 as per CERC Tariff Regulation 2019 norms.
- b. **Reference Price Level:** The capital cost has been worked out on the basis of prices prevailing during 4th Quarter, 2018 (based on vetting done by CEA) and it does not include any provision for future escalation in costs during project implementation period.
- c. **Cost Benefit Analysis:** As per Chapter 7 (Renovation and Modernization and Up-rating of Hydro Power Stations) of "Best practices in HE Power Generation" published



by CEA, the RM&U of hydro power plants is a cost-effective way for capacity addition. It is comparatively easier than constructing new projects and can yield results in about three to four years. The cost/MW of RM&U works of Unit No.1 of PHS is about Rs. 2.71 Crores/MW only. The cost benefit analysis of the Unit No.1 of PHS after the proposed RM&U work is detailed in revised Chapter-13 of the DPR (Volume- I) based on vetting by CEA. The levelized cost of generation for the proposed project over the 40 years of operations works out as Rs 2.94/KWh (based on CERC guidelines). The Levelized Tariff (based on CERC guidelines) works out to be Rs. 3.89/KWh. However, the cost benefit analysis is subjected to revision and the revised cost benefit analysis which along with necessary details will be submitted before this Commission in due course of time.

d. **Financial Package and Phasing of Expenditure:** The entire project has been envisaged to be commissioned in 17 months from the date of issuance of EPC order. Interest on long term loan capital has been considered at the rate of 8% p.a. while drawing the funds based on phasing of expenditure, it has been envisaged that equity and debt will be drawn simultaneously. Interest during construction (IDC) has been worked out based on above mentioned construction schedule, interest rate on long term loans and withdrawal pattern of fund.

22. Phasing of estimated capital cost for the RM&U works as per the DPR is shown below:

(In Rs. akh)								
Capex Phasing	10%	15%	15%	15%	15%	20%	10%	100%
	Qtr 1 (Only 2 months)	Qtr 2	Qtr 3	Qtr 4	Qtr 5	Qtr 6	Post Commiss ioning	Total
Equity excluding IDC	358.86	538.29	538.29	538.29	538.29	717.73	358.86	3,588.63
Debt excluding IDC	837.35	1,256.0 2	1,256.02	1,256.02	1,256.02	1,674.70	837.35	8,373.48



Total Capex excluding IDC								11,962.11
Interest during construction (IDC)	11.16	42.02	67.73	93.80	120.23	155.41	-	490.37
Equity incl. IDC	362.21	550.90	558.61	566.44	574.37	764.35	358.86	3,735.74
Debt incl. IDC	845.16	1,285.44	1,303.43	1,321.68	1,340.19	1,783.48	837.35	8,716.73
Total Capex incl. IDC								12,452.48

Exclusions: The cost estimate does not provide for following:

1. Any future escalation in prices.
2. Any changes in rates of duties & taxes

e. LEGAL FRAMEWORK

23. Petition has been filed invoking Section 79(1) (b) of the Act under which this Commission has the power to regulate the tariff of the Petitioner and pass such necessary Orders as it deems fit.

24. Regulation 27 (1) of the CERC Tariff Regulations, 2019:

- (a) Regulation 27 (4) of CERC Tariff Regulations, 2019 provides as mentioned below:

*“27 (4) After completion of the renovation and modernisation (R&M), the generating company or the transmission licensee, as the case may be, shall file a petition for determination of tariff. Expenditure incurred or projected to be incurred and admitted by the Commission after prudence check, and after deducting the **accumulated depreciation** already recovered from **the admitted project cost**, shall form the basis for determination of tariff.”*

- (b) Original Project cost has been defined in CERC Tariff Regulations, 2019 provided below:

*“3 (46) ‘**Original Project Cost**’ means the **capital expenditure** incurred by the generating company or the transmission licensee, as the case may be, **within the original scope of the project up to the cut-off date**, and as admitted by the Commission;”*



25. From the combined reading of above two Regulations, it emerges that depreciation recovered has to be deducted from capital cost approved up to cut-off date. The accumulated depreciation till date includes depreciation on original capital cost and depreciation of additional capitalisation. These two cannot be bifurcated. Secondly, PHS Unit- 1 was declared under commercial operation in December 1959 and concept of cut-off date was not available at that time.

26. As per DPR, the power station would be under Renovation Modernization & Uprating for a period of 17 months. However, considering recent developments i.e. pre-bid meetings, internal discussion etc. and recommendations from the Consultant MECON Limited the said timeline for RM&U is expected to be around 24 months. The petitioner will submit necessary details in this regard before this Commission in due course of time. The petitioner proposes to implement RM&U activity concurrently with generation to the extent possible as per schedule of activities. During this period power station will be under complete or partial shutdown for repair of Civil Structure and water conductor system and to carry out all works of Turbine Generator and associated equipment related to RM&U. As per DPR, Unit No. 1 will be under complete shutdown for a period of 9 months. However, the period of shutdown is subject to revision and necessary details in this regard will be submitted before this Commission in due course of time.

27. RM&U and generation of energy (to the extent) possible would be concurrent activities, the Petitioner prayed before this Commission to allow recovery of full normative O&M expenses to be allowed for 2019-24 period by the Commission from the beneficiaries during complete / partial shutdown of generating station for R&M works. The



Petitioner will continue to recover the O&M charges and interest on loan through tariff in terms proviso under Regulation 42(2), of CERC Tariff Regulations, 2019. Petitioner placed its reliance on judgment of Commission's Order dated 03.6.2016 in Petition No. 76/MP/2015, in the matter of NHPC Limited Renovation and Modernization proposal in respect of Bairasiul Power Station.

Hearing dated 25.8.2022

28. The matter was heard on 25.8.2022 and notice was issued to the Respondent to file the reply. During the course of hearing, learned counsel for the Petitioner sought the 'in-principle' approval of proposed additional capitalization on account of Renovation, Modernization and Up-rating (RM&U), in respect of Unit-1 of the existing Panchet Hydel Power Station, having an installed capacity of 40 MW.

29. The Petitioner, vide ROP dated 25.8.2022, was directed to obtain the consent of the beneficiaries with regard to RM & U of the Unit-1 and place the same on record.

30. The Petitioner in response to above has submitted that it had addressed letters to the Respondents. West Bengal State Electricity Distribution Company Limited (WBSEDCL) has stated that it was not a 'beneficiary' under IEGC and the PPA executed by it does not also specify the power station and therefore, the consent on the proposed RM & U does not arise. The Petitioner has further submitted that it has been supplying power to the pool and there are no specifically identified beneficiaries for this hydro power station.



Hearing dated 19.1.2023

31. The matter was again heard on 19.1.2022. The Petitioner, vide ROP dated 29.1.2023, was directed to file the additional information regarding details of proposed cost recovery, status of any objection/comment is received against notification published for consent for R&M works in newspaper and status of R&MU works i.e. proposed start date and completion date.

32. In compliance to the ROP of the hearing dated 19.1.2023, the Petitioner vide affidavit dated 5.2.2023 submitted the following additional information: -

A. The details of proposed cost recovery

- a) The recoverable Annual Fixed Cost (AFC) in respect of PHS for any year is derived based on the approved AFC as determined by this Commission as well as Station availability as per the applicable tariff Regulations. The recoverable AFC for PHS as determined by this Commission, in addition to other elements of input cost, viz. generation cost of different Generating Stations of the Petitioner itself including PHS, power purchase cost etc., becomes input cost while finalizing the Common Aggregate Revenue Requirement ("ARR") which is recovered from the 'End Distribution Consumers'.
- b) After firming up the total ARR of the Petitioner, the same is then segregated for the state of Jharkhand and West Bengal in the ratio of sale in the operational area of the respective states as per the methodology adopted by both the States. Therefore, the same is claimed before the appropriate Commission for admission



of the ARR, lastly, the approved ARR is then recovered through Tariff Scheduled from the end consumers of the respective States.

B. Status of any objection/comment is received against notification published for consent for R&M works in newspaper.

33. With respect to the status of objections / comments received from the stakeholders, the following submissions are noteworthy:

- a) In terms of the directions of this Commission vide ROP dated 25.08.2022, the Petitioner published the notice in various newspaper in West Bengal and Jharkhand regarding the present Petition inviting comments/suggestion from the stakeholders till 14.09.2022 (i.e. within 7 days from the publication) (Ref: Annexure P/2 to the Affidavit dated 14.10.2022). However, no response was received from the stakeholders.
- b) Further, the Petitioner also issued letters dated 02.09.2022 to WBSEDCL and Jharkhand Bijli Vitran Nigam Limited (JBVNL) seeking their comments / objections to the proposed RM&U of the PHS. In response, WBSEDCL vide its Email dated 06.09.2022 stated that WBSEDCL is not a 'beneficiary' under the Grid Code and even otherwise, the power drawn by WBSEDCL is in radial mode. In view thereof, WBSEDCL stated that the question of its consent on RM&U works for PHS does not arise. Notably, the Petitioner has not received any reply from JBVNL.
- c) In this regard, the Petitioner has filed an Affidavit dated 14.10.2022 placing on record the newspaper publication made by it along with the response received from WBSEDCL.



C. Status of R & M U works i.e. proposed start date and completion date.

34. With respect to the Status of R&MU works, the Petitioner has submitted that Letter of Award (LOA) for the R & M U work has already been issued on 17.01.2022. As per the said LOA, the dated of milestones are as follows:

- a) Start date:17.01.2022
- b) Scheduled date of completion: 16.01.2024 (i.e., 24 months)

D. Details of the revised cost benefit analysis as mentioned in the petition.

35. With respect to the details of Revised Cost Benefit Analysis, the Petitioner has submitted as follows:

- a) On 11.06.2019, the initial Detailed Project Report (“DPR”) along with Cost Estimates and Techno-Economic Analysis was submitted by the Petitioner before the Central Electricity Authority (CEA).
- b) Thereafter, CEA made certain observations/ comments on Petitioner’s DPR for PH’s RM&U works vide its letter 19.11.2020.
- c) In compliance of the CEA’s Letter dated 19.11.2020, the Petitioner submitted the revised DPR along appropriate modification in Chapter 13 (Cost Estimate and Financial Analysis) on 27.11.2020. CEA has accorded its technical acceptance to the said proposal vide their letter dated 03.02.2021 as given below:

Sl. No.	Description	Submitted by DVC (Rs. in lakh)	Vetted by CEA (Rs. in lakh)
I. Electro-Mechanical Works			
1.	Plant & Machinery	10858.31	10564.70
2.	Engg. Supervision, Detail Engg., Model testing of turbine,	1608.05	400.00



	consultant's fee, technological know-how, project management etc.		
3.	GST on above service	289.45	72.00
4.	Preoperative & other Expenses	1027.03	882.94
Total (E&M Works)		13782.84	11919.63
II. Civil Works			
5.	Civil Works as per BoQ	42.48	42.48
III. IDC & FC			
6.	IDC	626.26	490.00
7.	FC		0.00
Total Cost		14451.58	12452.11

d) Cost benefit analysis is subject to revision and the revised cost benefit analysis which along with necessary details will be submitted before this Commission in due course after the R&MU of the plant is concluded.

Analysis & Decision

36. The submissions have been considered. With regard to renovation and modernization (R&M), Regulation 27 of 2019 Tariff Regulations provides as under:

27. Additional Capitalization on account of Renovation and Modernization

*(1) The generating company or the transmission licensee, as the case may be intending to undertake renovation and modernization (R&M) of the generating station or unit thereof or transmission system or element thereof for the purpose of extension of life beyond the originally recognized useful life for the purpose of tariff, shall file a petition 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, and any other information considered to be relevant by the generating company or the transmission licensee:***

Provided that the generating company making the applications for renovation and modernization (R&M) shall not be eligible for Special Allowance under Regulation 28 of these regulations;



*Provided further that the generating company or the transmission licensee intending to undertake renovation and modernization (R&M) shall be required to obtain the **consent of the beneficiaries** or the long-term customers, as the case may be, for such renovation and modernization (R&M) and submit the same along with the petition.*

*(2) Where the generating company or the transmission licensee, as the case may be, makes an application for approval of its proposal for renovation and modernization (R&M), approval may be granted after due consideration of **reasonableness of the proposed cost estimates, financing plan, schedule of completion, interest during construction, use of efficient technology, cost-benefit analysis, expected duration of life extension, consent of the beneficiaries or long term customers**, if obtained, and such other factors as may be considered relevant by the Commission.*

(3) In case of gas/ liquid fuel based open/ combined cycle thermal generating station after 25 years of operation from date of commercial operation, any additional capital expenditure which has become necessary for renovation of gas turbines/steam turbine or additional capital expenditure necessary due to obsolescence or non-availability of spares for efficient operation of the stations shall be allowed:

Provided that any expenditure included in the renovation and modernization (R&M) on consumables and cost of components and spares which is generally covered in the O&M expenses during the major overhaul of gas turbine shall be suitably deducted from the expenditure to be allowed after prudence check.

(4) After completion of the renovation and modernization (R&M), the generating company or the transmission licensee, as the case may be, shall file a petition for determination of tariff. Expenditure incurred or projected to be incurred and admitted by the Commission after prudence check, and after deducting the accumulated depreciation already recovered from the admitted project cost, shall form the basis for determination of tariff.

37. It is observed that the requirement for R&M of generating plants have been stressed by the CEA, the Ministry of Power, GOI and in the Tariff Policy prescribed by the Central Government from time to time. CEA has considered the "Renovation and Modernization of Old Power Plants" as one of the best options to bridge the gap between demand and supply of power. It has also been stressed that the hydro plants which have completed their useful life shall undertake R&M for extending the life of the hydro plants, specially in view of the fact that newer capacity additions in hydro sector has slowed down in spite of various measures taken by MOP, GOI and this Commission to incentivize the hydro power plants. As per the requirement of Regulation 27(1) of the 2019 Tariff Regulations, the Petitioner has placed on record the DPR (which has been duly vetted by CEA) which provide the complete scope of RM&U works, justification, cost-benefit analysis, estimated



life extension from a reference date, financial package, phasing of expenditure, schedule of completion and reference price level etc.

Issues for consideration

38. Based on the submissions of the parties and the documents available on record, the issues which emerge for consideration as per Regulation 27(2) of the 2019 Tariff Regulations are examined hereunder:

Issue No. (A): Reasonableness of the proposed cost estimates, IDC and Cost Benefit Analysis:

39. The Petitioner submitted that as per Chapter 7 (Renovation and Modernization and Up-rating of Hydro Power Stations) of "Best practices in HE Power Generation" published by CEA, the RM&U of hydro power plants is a cost-effective way for capacity addition. The estimated completion cost of proposed RM&U of PHS is Rs. 12452.48 Lakhs including Interest during Construction (IDC) of Rs. 490.37 Lakhs. The capital cost has been worked out on the basis of prices prevailing during the 4th Quarter, 2018 (based on vetting done by CEA). It is comparatively easier than constructing new projects and can yield results in about three to four years. The cost/MW of RM&U works of Unit No.1 of PHS is about Rs. 2.71 Crores/MW only. The levelized cost of generation for the proposed project over the 40 years of operations works out as Rs 2.94/KWh (based on CERC guidelines). The levelized Tariff (based on CERC guidelines) works out to be Rs. 3.89/KWh. The useful Life of the power station is estimated to be 40 years after completion of R&M works. However, the cost benefit analysis is subjected to revision and the revised cost benefit analysis which along with necessary details will be submitted before this Commission in due course of time.



Analysis and decision:

40. We have considered the submissions of the Petitioner. In our view, the projects which have outlived their useful life should go in for R&M activities to ensure improved reliability and availability. Allowing operation of the old generating station with reduced capacity may hamper reliability and availability of the generating station which in turn may require the beneficiaries to arrange costly power during the prolonged outages the old generating station may have to face in absence of timely corrective action in terms of R&M activities. In the instant case, we noted the observations by CEA in its letter dated 03.02.2021, that the proposal is primarily for RM&U of electro-mechanical components with no modification/changes/repairing of Dam or its appurtenant is proposed and only minor civil works envisaged. The beneficiaries would be availing the benefit of reliable power with peaking capability for 40 years at expected levelized tariff of around Rs 3.89/kWh (as indicated in the DPR), which is much less than the tariff of new hydro generating stations commissioned during recent times at capital cost ranging from Rs.6 crore/MW to Rs.12 crore/MW.

Issue No. (B): Extension of Life Post R&M:

41. The Petitioner has stated that it has replied to the observations/comments raised by CEA in its letter dated 19.11.2020 and subsequently CEA has cleared the DPR for useful life of 40 years of the Unit No.1 of the PHS.

Analysis and Decision

42. Keeping in view that CEA had cleared the DPR for useful life of 40 years of the Unit No.1 of the PHS, we are inclined to allow the life extension of the Unit No.1 of the PHS by 40 years.



Issue No. (C): Review of Design Energy (DE)

43. As regards DE, the Petitioner has submitted that CEA, vide its letter No. 13/2(DVC)2020 /HE&RM/CEA/ 73 (dated 03.02.2021), approved the design energy of 105.50 MUs for Unit No.1 (46 MW) of the PHS (by weighted average method) as against the existing average annual generation for last 21 years of 67.83 MUs which is based upon the available flow & head of Station.

Analysis & Decision

44. The matter has been considered. It is noticed that CEA considering the updated hydrology, revised the installed capacity of Unit -1 after completion of RM&U works from 40 MW to 46 MW. Consequently, the DE of Unit -1 has revised from 67.83 MUs to 105.50 MUs. This would result in annual energy benefit for Unit -1 by 37.67 MUs. Considering the fact that the DE of the Unit No.1 of the PHS has been revised by CEA to 105.50 MUs, we allow the same.

Issue No. (D): Consent of the beneficiaries or long-term customers

45. With regard to obtaining the consent of the beneficiaries, the Commission vide ROP of the hearing dated 25.8.2023 and 19.1.2023 had directed the Petitioner to obtain the consent of the beneficiaries and submit the status of any objection/ comment received against notification published in newspapers for consent to the proposed RM&U of the PHS. In response to above, the Petitioner has submitted that it had published notice seeking comments/ suggestion from the stakeholders in the various newspapers in the States of West Bengal and Jharkhand as regards the proposal for RM&U in the present petition. However, no response was received from the stakeholders. The Petitioner has



also stated that it had issued letters dated 2.9.2022 to Respondents WBSEDCL and JBVNL seeking their comments / objections to the proposed RM&U of the PHS and in response, the Respondent WBSEDCL vide email dated 6.9.2022 has informed the Petitioner that WBSEDCL is not a 'beneficiary' under the Grid Code and even otherwise, the power drawn by WBSEDCL is in radial mode. Accordingly, the Respondent WBSEDCL has stated that the question of its consent for RM&U works for PHS does not arise. The Petitioner has also stated that it has not received any reply from the Respondent JBVNL.

Analysis & Decision

46. The matter has been examined. The second proviso to Regulation 27(1) and Regulation 27(2) of the 2019 Tariff Regulations provides as under:

27(1) xxx

xxx

*Provided further that the generating company or the transmission licensee intending to undertake renovation and modernization (R&M) shall be required to obtain the **consent of the beneficiaries** or the long-term customers, as the case may be, for such renovation and modernization (R&M) and submit the same along with the petition.*

*(2) Where the generating company or the transmission licensee, as the case may be, makes an application for approval of its proposal for renovation and modernization (R&M), approval may be granted after due consideration of reasonableness of the proposed cost estimates, financing plan, schedule of completion, interest during construction, use of efficient technology, cost-benefit analysis, expected duration of life extension, **consent of the beneficiaries or long term customers, if obtained**, and such other factors as may be considered relevant by the Commission”*

47. It is noticed from the submissions that, in terms of the second proviso, as quoted above, the Petitioner had sought the consent of the Respondents herein, vide letters dated 2.9.2022 addressed to these Respondents with regard to the proposed RM&U works of the generating station. While the Respondent WBSEDCL vide letter dated 6.9.2022 has informed that the question of seeking its comments does not arise, on the



ground that it was not a beneficiary under the IEGC and is drawing power in radial mode, the Respondent JBVNL had not offered any comment on the said proposal of the Petitioner. It is pertinent to note that since power from the generating station is on pooled basis, the Petitioner is eligible to claim the same from the Regulatory Commissions of both the States. It is further noticed that the Petitioner, had published notice in the various newspapers (including vernacular newspaper) within the States of West Bengal and Jharkhand on 7.9.2022, inviting comments/ suggestions, and requesting for consent on the RM&U proposal. It was also made clear by the Petitioner that if nothing was heard within 7 days of the said publication, the same would be considered as 'deemed consent'. Admittedly, in the present case, none of the parties including the Respondents herein, had submitted their response to the said letters/newspaper publications. In this background, the Petitioner cannot be faulted for not taking steps to obtain consent of the beneficiaries or long-term customers. In our considered view, the absence/non-receipt of consent from beneficiaries/long-term customers, in the present case, cannot stand in the way of granting the reliefs prayed for by the Petitioner. Accordingly, the prayers of the Petitioner [(b) & (c)] as in para 1 above, is allowed in terms of Regulation 27(2) of the 2019 Tariff Regulations. We, therefore, grant in-principle approval of the RM&U of Unit No.1 of PHS at the total cost of Rs. 12,452.48 lakhs including IDC of Rs. 490.37 lakh (as vetted by CEA) along with life extension of Unit No.1 of PHS by 40 years. Also, the revised Design Energy of Unit No.1 of PHS, after completion of RM&U shall be 105.50 MUs, and for both the Units, the DE shall be 197.25 Mus, as approved by the CEA. After completion of the said RM&U, the Petitioner shall file a petition for determination of tariff of the generating station, in terms of the Regulation 27(4) of the 2019 Tariff Regulations.



48. As regards the prayers (d) & (e) of the Petitioner, it is observed that the Commission vide order dated 3.6.2016 in Petition No. 76/MP/2015 while approving the R&M proposal in respect of Bairasiul Power Station of the Petitioner had allowed the recovery of only two components of tariff namely, the O&M expenses and Interest on Loan during the period when the unit/station was under shut down, as provided to thermal generating stations executing R&M/LE program. Though the above proviso relates to thermal generating stations, the same is applicable to all generating stations /units thereof or the transmission system. In terms of the said proviso, during the period of shutdown of the generating station or transmission system, as the case may be, due to R&M, the generating company or transmission licensee shall be allowed to recover part tariff which shall include only O&M expenses and interest on loan. Accordingly, we direct that the Petitioner is entitled to recover tariff comprising only of O&M and interest on loan during the R&M period.

49. For the purpose of billing for the period 2019-24, we direct that (i) the units shall be taken out for R&M during low inflow periods so as to minimize the loss of energy and (ii) the existing procedure of declaring capacity and energy generation based on water availability for the 2nd unit, which is not in R&M, shall be followed as per Regulation 44 (2) and (3) of 2019 Tariff Regulations. i.e., the Plant Availability for the month has to be considered as 40MW for calculation of capacity charge for unit-2 and design energy corresponding to one unit has to be considered for calculating energy charges for Unit-2.

50. Petition No. 81/MP/2022 is disposed of in terms of above.

Sd/-
(P. K. Singh)
Member

Sd/-
(Arun Goyal)
Member

Sd/-
(I. S. Jha)
Member

