

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No.189/MP/2022

Coram:

Shri I.S. Jha, Member

Shri Arun Goyal, Member

Shri Pravas Kumar Singh, Member

Date of Order: 25th October 2023

In the matter of:

Petition under Sections 62 and 79 (1) of the Electricity Act, 2003 read with related provisions of the Chapter-5 of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 and Regulation 27(1) of the Central Electricity Regulatory Commission (Terms and Condition of Tariff) Regulations, 2019 for approval of proposal for Reconstruction, Renovation & Modernization for life extension beyond the normal useful life in respect of Kopili Power Station (4x50 MW = 200 MW) of North Eastern Electric Power Corporation Limited (NEEPCO), Shillong.

And

In the matter of

North Eastern Electric Power Corporation Limited,
Corporate Office: Brookland Compound,
Lower New Colony, Shillong 793 003, Meghalaya.

.....Petitioner

Vs

1. Chairman

Assam Power Distribution Company Limited,



“BijuleeBhawan”, Paltanbazar,
Guwahati 781 001, Assam.

2. Chairman & Managing Director,
Meghalaya Power Distribution Corporation Limited, Lumjinshai, Short Round Road,
Shillong -799001, Meghalaya.
3. Deputy General Manager, Commercial & System Operation,
Tripura State Electricity Corporation Limited,
Bidyut Bhavan, North Banamalipur,
Agartala -799 001, Tripura.
4. The Engineer-in-Chief,
Power & Electricity Department,
Government of Mizoram,
New Secretariat Complex, Kawlphetha, Aizwal- 796001
5. The Managing Director,
Manipur State Power Distribution Company Limited,
3rd Floor, New Directorate Building, Near 2nd M.R Gate,
Imphal- Dimapur Road, Imphal- 795001, Manipur.
6. Chief Engineer (Power),
Department of Power, Bidyut Bhawan,
Government of Arunachal Pradesh,
Itanagar-791111, Arunachal Pradesh.
7. The Chief Engineer (Power),
Department of Power,
Government of Nagaland,



Electricity House, A G Colony.
Kohima- 797001, Nagaland.

8. Member Secretary,
North Eastern Regional Power Committee,
NERPC Complex, Dong Parmaw,
Lapalang, Shillong-793006, Meghalaya.
9. Executive Director,
North Eastern Regional Load Despatch Centre,
Dongtiah, Lower Nongrah,
Lapalang, Shillong -793006, Meghalaya.

.....Respondents

Parties Present:

Shri Susanta Deka, NEEPCO
Shri Ripunjoy Bhuyan, NEEPCO
Ms. Elizabeth Prybot, NEEPCO
Shri S. Deka, NEEPCO
Shri R. Bhuyan, NEEPCO
Ms. Elizabeth Pyrbot, NEEPCO

ORDER

The Petitioner, North Eastern Electric Power Corporation Limited (NEEPCO) has filed the present petition seeking the following reliefs:

- a) *Approve the Detailed Project Report on Reconstruction; Renovation & Modernization for Life Extension of the 4x50 MW Kopili Power Station with an **estimated project cost of Rs 1045.75 crore** and which include Hard Cost of Rs.824.12 Crore and Rs.53.95 crore as IDC and residual value of the old asset as Rs.167.68 Crore.*



b) Adjust the filing fees deposited against Petition no 717/MP/2020 vide UTR no SBINR12020110400073130 dated 04.11.2020 for an amount of Rs.3,00,000.00 only.

Background:

2. The Kopili Hydroelectric Power Station (4x50 MW = 200 MW) (Kopili HPS), a Hydro-Electric Power Station located in the Dima Hasao District of Assam is owned and operated by NEEPCO.

3. The Kopili Hydroelectric Power Station comprises of three power stations, namely Kopili Power Station (4x50 MW), Khandong Power Station (2x25 MW) and Kopili Power Station Stage II (1X25 MW). Initially, the Plant was of the capacity of 150 MW i.e. (2X50MW) in Kopili Power Station and (2X25 MW) in Khandong Power Station. Later on, (2X50 MW) were added to Kopili Power Station as KHEP First Stage Extension in the year 1997. In addition, 1X25 MW Khondong Stage-II Power station was added to the project with date of commissioning on 26.07.2004. The date of commercial operation of the units of the Kopili Power Station (4x50 MW), and the corresponding unit capacities are indicated in the table below:

Unit No.	Date Of Commercial Operation	Unit Capacity
Unit I	05.07.1988	50 MW
Unit II	22.07.1988	50 MW
Unit III	01.05.1997	50 MW
Unit IV	12.07.1997	50 MW
Station COD	12.07.1997	



4. The Petitioner has filled present Petition for approval of Reconstruction, Renovation & Modernization (R&M) for Life Extension of the 4x50 MW Kopili Power Station.

5. The Petitioner had filed Petition No. 717/MP/2020 for approval of Reconstruction, R&M in respect of Kopili Power Station (4x50 MW). However, Commission vide order dated 19.7.2021 had disposed of the above petition as CEA's vetting on DPR was awaited and observed that it would be appropriate to consider the matter regarding approval of the DPR on Reconstruction, R&M for life extension of Kopili Power Station (4 x 50 MW) only after the report of CEA is received. Accordingly, on a specific observation by the Commission the representative for the Petitioner agreed to the same.

6. With regard to R&M Regulation 27 of 2019 Tariff Regulations, provides as under:

*“27. Additional Capitalisation on account of Renovation and Modernisation (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 recognised 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 modernisation (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.
.....”*

Submissions by the Petitioner

7. The Petitioner has submitted that CEA has given its concurrence to the Detailed Project Report (DPR) and accordingly, the instant petition has been filed. The Petitioner has submitted as under:

I. Justification for Reconstruction, Renovation & Modernization

a) Clause 73 under Regulation 3 of the Tariff Regulations, 2019 states as below:

“Useful Life’ in relation to a unit of a generating station, integrated mines, transmission system and communication system from the date of commercial operation shall mean the following:

(a) Coal/Lignite based thermal generating station 25 years

(b) Gas/Liquid fuel based thermal generating station 25 years

(c) AC and DC sub-station 25 years

(d) Gas Insulated Substation (GIS) 25 years

(e) Hydro generating station including pumped storage hydro generating stations 40 years

(f) Transmission line (including HVAC & HVDC) 35 years

(g) Communication system 15 years

Provided that the extension of life of the projects beyond the completion of their useful life shall be decided by the Commission on case to case basis;”

II. Units 1 and 2 of Kopili PS have been in operation for more than 32 years and units 3 and 4 have completed 23 years of operation.



III.Devastation of Kopili PH: In the early morning of 7th October, 2019, an unfortunate incident of penstock rupture occurred, causing complete inundation of the power house in mud and water and loss of four lives. As the Penstock Protection Butterfly Valve was damaged and rendered inoperable by the incident, the flow of water could not be controlled and it continued till 12th October, 2019, when the intake gate could be finally lowered with great difficulty under heavy water flowing conditions. The impact of the rupture caused the hills on the upstream side to be washed away, filling up the machine dome in the power house and the water flowing at the EOT crane beam level. The Generating Transformers Switch yard was also completely covered by mud and sand to a height of 2-3 meters. The power house approach roads also have been completely washed away. As a result of this incident the entire generating plant has been rendered completely inoperable and beyond restoration.

IV.Even before this unfortunate incident, since 2006 the power house had been operating in extremely acidic environment, with the pH value of reservoir water feeding the plant ranging between 2.8 to 5.44, causing extensive damage to the underwater metallic parts. As the machines were not designed to operate under such acidic conditions, the plant availability and generation had gone down considerably. Formation of sulphuric acid in some parts of the upper catchment area due to the oxidation and hydration of pyrites that are exposed to atmosphere by human activities and leaching of the acid into the surface and sub-surface flow that join the reservoir was inferred as a reason of the acidity. GSI study conducted earlier revealed that the sub-water sheds on western side of the Kopili Catchment at upstream of the Khandong Dam is contributing most in contaminating water in the area and making it acidic. Thus, the aforesaid sub-water shed appears to have



already become environmental hot spot over an unknown period. GSI has identified unscientific extraction of coal in the catchment area as primary reason for this acidic nature of water.

V.The Plant started to get impaired to a certain extent due to reservoir acidity problem, which was first detected in 2006 when Geological Survey of India (GSI) was drafted by NEEPCO to find out the causes of some damages to the project. Multidisciplinary team of experts from CWC, CEA, CSMRS visited Kopili HEP in 2009 and suggested different measures to cope up with the problem, including replacement of the metallic parts with parts made of acid resistant materials.

VI.Moreover, being top bracketed high speed machines (600 rpm), the units of Kopili have experienced quite a few unique problems like Labyrinth Failure, Resonance, failure of brake track etc.

VII.Due to long operation over three decades, the operating efficiency of the machines had deteriorated. The generating units have got de-rated and the condition of their auxiliaries, instruments, protective relays & control equipment have deteriorated to such an extent that the combined output of the power plants have fallen below the nameplate capacity with all units running (including the 25 MW Kopili – II unit which is fed by the same Water Conductor System). The units were operating at 100% gate opening to achieve 67-68 MW against the rated Installed Capacity of 75 MW at FRL i.e. 725.00M. The units with 100% gate opening are not able to respond to grid codes like Primary Response, RGMO, AGC (Automatic Generation Control) etc.

VIII.Moreover, the adverse condition of the equipment is leading to frequent breakdowns, resulting in relatively low plant load factor. Thus, a need is established to suitably refurbish



& modernize the units to obtain the desired output along with life extension of machine & plant and adoption of modern technologies for better control and monitoring.

IX. Following problems are being faced at the power station, causing frequent outages of the generating units, which in turn is leading to substantial wastage of available water power potential:

- Excessive wear & tear and erosion / damages of underwater parts due to both ageing and acidic reservoir water. Deterioration of the underwater parts is a major factor for the inefficient operation of the power plant.
- Inefficient / old design / obsolete valve, MIV, turbines and generators.
- Old type Governors.
- Unreliable functioning of Hydro-Mechanical equipment.
- Inefficient utilization of water.
- Non-availability of spare parts of outdated systems and equipment.
- Because of less efficiency, inability to adhere to latest Indian Grid Code, like primary response etc.
- After complete submergence of the Power House on 07/10/2019, most of the Electro Mechanical equipment are totally damaged, and repairing is not a feasible solution.
- Low overall efficiency of the plant, due to ageing, acidic corrosion, extensive repairing work in underwater parts etc.

X. Therefore, the need for Reconstruction, Renovation and Modernization of the Kopili PH can be summarized as below:

- Deterioration of plant components due to ageing



- Damage of equipment due to complete inundation of the Power House in mud, sand and water for prolonged period
- Deterioration of plant components due to Acidic corrosion
- Loss of performance/ Efficiency
- Life Extension
- Adoption of modern Technology

XI. Some of the major outages suffered by the Plant since 2004 due to the above mentioned reasons are detailed at paragraph 1.3 of Chapter 1 of the DPR.

XII. CEA guidelines on the “Best Practices & Bench Marking for Hydro” under Chapter 7, Renovation, and Modernisation & Up-rating of hydro power plants stipulate that by undertaking timely R&M & Life extension program, the generating plant can be made to operate for an extended period of 20-25 years with improved reliability and availability.

XIII. Regulations 27 (1) and 27 (2) of the Tariff Regulations, 2019 state as follows:

“27. Additional Capitalisation on account of Renovation and Modernisation

(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 recognised 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 modernisation(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.”

8. Against the above background, the Petitioner has prepared a Detailed Project Report (DPR) on Reconstruction, Renovation & Modernization for life extension of the Kopili Power Station. The Petitioner now humbly takes the liberty to submit this Petition before the Commission for approval of the DPR.

XV. Although components like Dam and spillway repair, repairs of HRT, replacement of both penstocks, repair of intake gates, spillway gates, draft tube gates, various hoists etc. shall also be taken up during Reconstruction/ R&M, however, predominantly Electro-mechanical equipment of power station are proposed to be replaced (although certain components like spiral casing etc. is to be retained & refurbishment is envisaged in a number of components) in “Reconstruction, Renovation & Modernisation program of Kopili power station”.

XVI. Consent for undertaking the Reconstruction, Renovation & Modernization works has been sought for from the beneficiaries of the Plant i.e. Respondents at Sl. Nos. 1 to 7 mentioned above. Consent has been received from all the above mentioned beneficiaries.

XVII. The Board of Directors of NEEPCO at its 260th Meeting held on 15.09.2020 approved the DPR on Reconstruction, Renovation and Modernization for Life Extension of the Kopili



Power Station with an estimated cost of Rs.854.85 crore (including IDC and financing charges of Rs.42.20 crore).

XVIII.Scope of Work and Justifications for the Proposed Reconstruction and R&M Activities

The scope of work and justification for the same is discussed in detail in Chapter – III of the DPR.

XIX.Installed Capacity & Design Energy

The original installed capacity of the Plant is 200 MW (50 MWx4) with an annual Design Energy of 1034 MUs. However, Hydro Project Appraisal Division, CEA letter dated 05.03.2021 approved the revised Design Energy of 993.80 MUs for the plant.

XX.Estimated Project Completion Cost

In the submitted DPR the cost the project has been estimated at March 2020 Price Level with a construction period of 24 months. The estimated present day cost of the project is Rs.1117.07 crore, including Rs.870.76 crore of Hard Cost and Rs.47.21 crore as IDC at March 2020 Price Level, a lump sum provision of Rs.2.0 crore is kept towards financial charge and a residual cost of Rs.197.10 crore is estimated.

XXI. CEA has approved the cost as under:

- I. Hydro Project Appraisal Division, CEA vide letter dated 22.03.2021 has vetted the E&M Cost for Rs. 391.11 Crore at January 2021 price level.
- II. CEA's Hydro Engineering and Renovation and Modernisation Division vide its letter no. 132/2 (NEEPCO-Kopili) 2021/HE&RM/CEA dated 04.06.2021 based on recommendation of Thermal Civil Design Division, CEA letter dated



3.06.2021 has vetted the Civil and HM works Cost at Rs. 43300.67 lakhs at January 2021 Price level.

III. CEA's Hydro Engineering and Renovation and Modernisation Division vide its letter no. 132/2 (NEEPCO-Kopili) 2021/HE&RM/CEA/261 dated 21.06.2021 has given the concurrence to the DPR and vetted the hard cost (without IDC, FC) at Jan'2021 price level for Rs.82411.67 lakh.

IV. Vide CEA letter no. 13/2(NEEPCO-Kopili)/2021/HE&RM/CEA dated 20.06.2022, approved the IDC of Rs.53. 97 Crore i.e. Capital cost including IDC stands at Rs. 878.09 Crores (Rs.824.12+53.95 Crore). Further, residual value of the old asset has been estimated at Rs.167.68 Crore. Considering the approved capital cost and Tariff Regulation 2019, the 1st Year and levelised tariff is estimated as Rs. 2.37/unit and Rs. 2.39/unit. The abstract of cost estimate is shown below:

V.

Sl. No	Description	Submitted by NEEPCO (Rupees in Lakh)	Vetted by CEA (Rupees in Lakh)
I. Electro Mechanical Works			
1.	Plant & Machinery	26722.96	26722.96
2	Engg., Supervision, Detail Engineering , Model Testing of Turbine, Consultant Fees , technological know-how , project Management etc	3430.36	2341.19
3	GST on above service	5619.36	5553.20
4	Pre-operative and other expenses	3875.41	3581.42
5	Dismantling Charges	966.01	912.41
Total (E&M) Works		40614.00	39111.00
II. HM & Civil Works			
6	HM& Civil Works	43759.90	43300.67
Total Hard Cost (Rs. In Lakh)		84373.90	82411.69



IDC(In Lakh)		5397.00*
Total R&M cost approved by CEA		87808.69
Residual Value of old Asset		16768.00
Grand Total (in Lakh)		104576.69*

*The Petitioner has indicated total amount of Rs. 104574.69 lakh considering IDC of Rs.5395 lakh whereas CEA has vetted IDC Rs.5397 lakh and we have considered the same.

XXII.Project Completion Period

The Reconstruction, Renovation and Modernization project of Kopili Power Station is scheduled for completion in 24 months.

XXIII.Estimated Life Extension

The life of the generating station is estimated to be extended by 40 years from commissioning on completion of Reconstruction, Renovation and Modernization works.

XXIV.Project Financing

The project is proposed to be financed through loan at the rate of interest of 7.50 % p.a. For purpose of tariff calculations 70: 30 Debt: Equity ratio has been considered. No foreign financing is envisaged and hence FERV has not been taken into consideration.

XXV.Tariff

Taking into consideration all normative parameters as defined in the Tariff Regulations, 2019, the tariff works out as below:

1st year tariff = Rs. 2.37/kWh
 Levellized tariff: - Rs 2.39/kWh

XXVI.Cost Benefit Analysis



On detailed analysis, it is seen that R&M work is extremely beneficial in comparison to construction of a new project of a similar size. The key comparisons are shown below:

- i) Based on hydrological data (1998-99 to 2009-10) and restriction in discharge of HRT, up-rating of capacity of power plant is not envisaged. Therefore, the proposal is for power plant size of 200MW (4 x 50 MW) with optimized annual energy of 1034MU. The average generation by power plant in last 15 years is 823.96 MU. The plant has not been able to achieve its design energy most of the time. Considering historical average energy and annual generation as suggested by enclosed power potential and water availability study, (i.e. 1034MU in 90% dependable year at 95% machine availability) and there is likely benefit in annual generation of 210.04MU over the average achieved generation of last 15 years.
- ii) The cost / MW for the proposed R&M works is about **Rs. 5.6 Crores per megawatt**, as against of about Rs.10.0 crore Per megawatt for new hydroelectric power plant of similar size.
- iii) Post Restoration, R&M, the 1st year tariff of Power Station is expected to be Rs.2.39/kWh and the levelized tariff is likely expected to be Rs.2.37/kWh considering a debt-equity ratio of 70:30 and 12% free power to the home States.
- iv) Levelized tariff for new project of similar size, considering present day cost of the project @ 10 crore per MW, works out to Rs. 5.0 /kWh

XXVII. Considering the above, it may be concluded that, it is highly economical to go for an extensive Reconstruction, Renovation and Modernization program for the 200 MW Kopili Power Station, which will not only provide reliable, environment friendly electric power to



the country, but also, the cost of production, after completion of the project will remain much lower than the average price of power in the present circumstances.

Replies and Rejoinders

Reply of Respondent No. 1 (APDCL)

9. The Respondent, APSCCL vide its affidavit dated 27.3.2023 in reply to the petition has submitted as under:

- a) The Petitioner has submitted the certificate to the effect that the assets claimed during additional capitalisation for the period 2014-19 got damaged during the inundation of Kopili Power House on 07/10/2019. Post inundation, under compulsion assets of similar nature are included in the proposed R&M works.
- b) It seems that the Petitioner is of the view that amount of Rs 130.89 Cr claimed as additional capitalisation in the period 2014-19 can be claimed again by the Petitioner on the basis of the events in 2019-20. The Petitioner should submit item wise justifications of the assets which are claimed again along with substantial documentary evidence that those items were damaged in 2019.
- c) Petitioner has failed to segregate the items it has claimed in the R&M Petition with the items already claimed as additional capital expenditure during the period 2014-19 (Petition No 370/GT/2019). As such, it is paramount that the Petitioner provides a comparative statement of the items/work to be claimed in the R&M Petition with the items already claimed in 2014-19.



d) The calculation of levelized tariff can only be considered when there is clarity whether the Petitioner has not claimed any items/works which were already being claimed in the Petition 370/GT/2019.

10. The Petitioner has not filed its rejoinder to above reply of APDCL.

Hearing dated 12.12.2022

11. The matter was heard and admitted on 12.12.2022. During the hearing, the representative of the Petitioner submitted that the present petition has been filed for approval of the proposal (DPR) towards R&M for life extension of the Kopili Power Station, beyond its normal useful life. On a specific query by the Commission as to whether the approval of cost by CEA and the consent of the beneficiaries for R&M have been obtained, the representative of the Petitioner affirmed the same.

Hearing dated 22.02.2023

12. The matter was again heard on 22.02.2023. Commission after hearing the parties reserved the matter in the petition and directed the Petitioner to submit the following additional information:

- (a) Certificate to the effect that additional capitalization claimed during the period 2014-19 (in Petition No. 370/GT/2019) are not included under the scope of the proposed R&M works.
- (b) Status of the R&M works (schedule of completion).
- (c) Calculations for the residual value of Rs.16768.00 lakh, indicated for old asset.
- (d) Calculations for levelized tariff (in MS excel)



13. The Petitioner vide affidavit dated 27.3.2023 in compliance to the above ROP of the hearing dated 22.02.2023, submitted the following additional information as under:

- (a) A Certificate certifying that the additional capitalization claimed during the period 2014-19 (in Petition No. 370/GT/2019) are not included under the scope of the proposed R&M works. However, the assets claimed in the additional capitalization during the period 2014-19 got damaged during the inundation of Kopali Power House on 7/10/2019. Post inundation, under compulsion assets of similar nature are included in the present proposed R&M works.
- (b) PERT / CPM chart for the R&M works: Schedule of balance works- Civil works start on 01.01.2021 and finish on 22.04.2023. HM works start on 10.09.2021 and finish on 07.03.2023. EM works start on 02.04.2021 and finish on 30.04.2023.
- (c) Capital Cost as on the last date of operation and decapitalization of assets.
- (d) The assumptions considered along with detailed computations for arriving at 1st year tariff (Rs.2.37/kWh) and levelized tariff (Rs.2.39/kWh).

Analysis & Decision

14. The submissions in the petition 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 Modernisation

*(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 recognised 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 modernisation (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.

15. 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 (CEA has given its concurrence to the DPR) which provides the complete scope of R&M works, justification, cost estimate, economic and financial evaluation, estimated life extension from a reference date, financial package, phasing of expenditure, schedule of completion and reference price level etc.

Issues for consideration

16. 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:

17. 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, by undertaking timely RM&U & Life extension program, the generating plant can be made to operate for an extended period of 20-25 years with improved reliability and availability. The estimated completion cost of proposed Reconstruction, R&M of Kopili HPS is Rs. 1045.77 crore including CEA approved cost of Rs. 878.09 crore and residual value of old



asset of Rs. 167.68 crore. The capital cost has been worked out at January 2021 Price Level. The cost / MW for the proposed R&M works is about Rs. 5.6 crore per megawatt, as against of about Rs.10.0 crore per megawatt for new hydroelectric power plant of similar size. Post Restoration, R&M, the 1st year tariff of Power Station is expected to be Rs.2.37/kWh (based on CERC guidelines) and the levelized tariff is likely expected to be Rs.2.39/kWh considering a debt-equity ratio of 70:30 and 12% free power to the home States. Levelized tariff for new project of similar size, considering present day cost of the project at 10 crore per MW, works out to Rs. 5.0 /kWh The useful Life of the power station is estimated to be 40 years after completion of R&M works.

Analysis and decision:

18. We have considered the submissions of the Petitioner and the Respondent, APDCL. 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 of the old generating station. In the instant case, the R&M proposal is before the completion of useful life due to the reasons such as incident of penstock rupture, operation in extremely acidic environment, deterioration in operating efficiency of the machines due to long operation over three decades. The generating units have got de-rated and the condition of their auxiliaries, instruments, protective relays & control equipment have deteriorated to such an extent that the combined output of the power plants have fallen below the nameplate capacity with all units running.



19. Consequent to the above, the Petitioner has submitted the DPR to CEA. CEA vide letter dated 21.06.2021 gave concurrence to the DPR and vetted the hard cost (without IDC, FC) at Jan 2021 price level for Rs. 824.12 crore. Further, CEA vide letter dated 20.06.2022, approved the IDC of Rs. 53.97 crore. As such, the total cost approved by CEA for R&M works out to Rs. 878.09 lakh.

20. We also note the observations of CEA in its letter dated 21.06.2021 that the proposal is primarily for replacement of electro-mechanical component of power station. The works like Dam and spillway repair, HRT repair, penstocks replacement, intake gates repair, draft tube gates repair, and repair of various hoists etc. shall also be taken up during Reconstruction and R&M. The beneficiaries would be availing the benefit of reliable power with peaking capability for 40 years at expected levelized tariff of around Rs 2.39/kWh (as indicated in the DPR/CEA approval), 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:

21. The Petitioner has stated that life of the generating station is estimated to be extended by 40 years from commissioning on completion of Reconstruction, Renovation and Modernization works.

Analysis and Decision

22. Keeping in view that CEA had cleared the DPR for useful life of 40 years of the project, we allow the life extension of the Kopili HPS by 40 years.



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

23. As regards DE, the Petitioner has submitted that CEA, vide its letter No. CEA-HY-12-33/2/2020 (dated 05.03.2021), approved the design energy of 993.80 MUs for Kopili HPS (200 MW) as against the existing DE of 1034 MUs.

Analysis & Decision

24. The matter has been considered. It is noticed that CEA considering the updated Power Potential Study of Kopili HPS and revised the Design Energy as 993.80 Mus. Accordingly, we allow the same.

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

With regard to obtaining the consent of the beneficiaries, the petitioner has submitted that consent for undertaking the Reconstruction, R&M works has been sought from the beneficiaries of the Plant.

25. 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”*



26. 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 for proposed Reconstruction, R&M work and same has been received from all the beneficiaries. However, Assam Power Distribution Company Ltd, Manipur State Power Distribution Company Limited, Power & Electricity Department, Government of Mizoram have granted their consent subject to the condition that R&M works would be completed by NEEPCO within scheduled completion date and the tariff proposed is upper ceiling and in no circumstances any escalation thereon would be permissible. Further, Tripura State Electricity Corporation Ltd has given its consent subject the condition that tariff should be within Rs. 2.62 per unit and any time and cost overrun and its impact on tariff would not be accepted by the same. We have considered the submissions. It is noticed that all the beneficiaries have given their consent for R&M of the instant generating station. However, with regard the comment of some beneficiaries regarding tariff, the Commission is of the considered view that tariff will be determined by the Commission based on the tariff petition filed for determination of tariff of the generating station, in terms of the prevailing Tariff Regulations.

Recommendations

27. Considering the above discussions, regarding the prayer (a) of the Petitioner for in-principle approval of R&M of the generating station, the Commission based on the Detailed Project Report vetted by CEA, approves the R&M for life extension of the 4x50 MW Kopili Power Station with an estimated project cost of Rs 878.09 crore (Rs. 824.12+53.97 Crore) including IDC of Rs. 53.97 crore as vetted by CEA along with life extension of the generating



station by 40 years. The revised Design Energy of the generating station after completion of RM&U shall be 993.80 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. As regards approval of residual value of the old asset, the Commission observes that treatment of residual value of the old asset would be a considered in the petition for tariff determination post R&M.

28. With regard to the contention of the Respondent APDCL, the Petitioner is directed to keep separate details for assets which were procured during 2014-19 tariff period and are also included in R&M scheme due damage caused during penstock failures. Also as per the conditional NOC given by the beneficiaries, the petitioner is directed to implement the R&M scheme within the scheduled completion date.

29. Further, with regard to tariff during the R&M period, 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 systems. 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 for the period units under the R&M.

30. 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 units, which are not in R&M, shall be followed as per Regulation 44 (2) and (3) of 2019 Tariff Regulations.

31. As regards the prayer (b) of the Petitioner, it is observed that the Commission vide Order dated 19.7.2021 in Petition No. 717/MP/2020 agreed to adjust the filing fees deposited by Petitioner in respect of Petition No 717/MP/2020 against the fresh petition, based on the report of CEA on DPR, to be filed by the Petitioner.

32. Petition No. 189/MP/2022 is disposed of in terms of above.

Sd/-
(P. K. Singh)
Member

Sd/-
(Arun Goyal)
Member

SD/d/-
(I. S. Jha)
Member

