Before

UTTARAKHAND ELECTRICITY REGULATORY COMMISSION

Pet. No. 05 of 2023

In the Matter of:

Petition for approval of capital investment on refurbishment of damaged Power Channel from Dakpathar Silt Ejector to intake of Dhalipur Power House.

And

In the Matter of:

Managing Director,
UJVN Limited,
"UJJWAL", Maharani Bagh, GMS Road,
Dehradun.

...Petitioner

Coram

Shri D.P. Gairola **Member (Law) /Chairman (I/c)**

Shri M.K. Jain **Member (Technical)**

Date of Order: April 12, 2023

ORDER

This Order relates to the Petition filed by UJVN Ltd. (hereinafter referred to as "the Petitioner") seeking approval of capital investment on refurbishment of damaged Power Channel from Dakpathar Silt Ejector to intake of Dhalipur Powerhouse under Section 61 and Section 86 of the Electricity Act, 2003 read with the Regulation 22 of Uttarakhand Electricity Regulatory Commission (Terms and Conditions for Determination of Multi Year Tariff) Regulations, 2021 and guidelines issued by the Commission .

Background

2. The Petitioner vide its letter No. M-1282/UJVNL/02/D(O)/B-8 dated 30.12.2022 submitted a Petition for 'Seeking approval of capital investment on Refurbishment of Damaged Power Channel from Dakpathar Silt Ejector to Intake of Dhalipur Powerhouse'.

3. The Petitioner under the facts of the case has submitted that:

"…

3.4 *Dakpathar Barrage is constructed over river Yamuna. Tons river is a major tributary of Yamuna River. Dakpathar Barrage is in the downstream of the confluence of Yamuna River and Tons River. Tail Race Channel of Khodri Power Station discharges water of Tons River in the reservoir of Dakpathar Barrage.*

3.5 *A 14 km long power channel take off from the left bank of Dakpathar Barrage. This power channel feeds water to the two surface power houses i.e. Dhakrani Powerhouse (33.75 MW) & Dhalipur Powerhouse (51 MW) which were commissioned in the year 1965.*

3.6 *The 14 km long power channel from Dakpathar Silt Ejector to intake of Dhalipur Powerhouse and 4 km from Asan Barrage to intake of Kulhal Powerhouse is extremely important structure which helps generating 114.75 MW (33.75 MW from Dhakrani HEP, 51 MW from Dhalipur HEP and 30 MW from Kulhal HEP) in Yamuna Valley.*

3.7 *Major civil/refurbishment works of power channel are required to be carried out from time to time to address the damages/dysfunctionalities of power channel as well as to ensure its safe and continuous operation for quality power generation from the connected power station(s).*

3.8 *To address such damages, the major civil works for the refurbishment/repair of power channel from Dakpathar Silt Ejector to Intake of Dhalipur Powerhouse were carried out from 22/03/2017 to 24/04/2017 in a one-month closure period with total expenditure of Rs. 17.36 Crore.*

3.9 *Since the last 05 years, the power channel is continuously in service without any major repair/closure. While examining the power channel during the short closure period in the monsoon season, the excessive damages have been observed mainly at the location where the power channel is in cutting portion i.e. between TRC of Dhakrani Powerhouse and Court Bridge (1 km in length) and between Court Bridge and Dhakrani Village Bridge (1.5 km in length).*

3.10 *The side slopes at many locations in these cutting portions have completely collapsed, as a result the profile of the side slopes and lining of the power channel has been damaged.*

3.11 *Besides the cutting portion, some damages have also been observed in the filling portion such as damaged lining, erosion of concrete tiles etc.*

3.12 *Therefore, the refurbishment of damaged power channel is necessarily required to ensure safety and maximum operational availability of the power channel for uninterrupted power generation from the plants.*

3.13 *A closure of 45 days shall be required to execute the works related to refurbishment of power channel below the Full Supply Level (FSL).*

3.14 *As per Regulation 22 (4) of UERC Tariff Regulations, 2021, a generating company is required to get prior approval for the additional capitalization works exceeding ₹ 5 Crore. The Regulation 22 (4) of UERC Tariff Regulations, 2021 states that: -*

*"Any addition/modification to the existing assets exceeding Rs. 2.50 Crore in case of distribution licensees and Rs. 5 Crore in case of generating companies/transmission licensees shall be taken up only after prior approval of the Commission. The investment approval applications covered under this sub-*regulation *are excluded from the application of proviso to Sub-regulation (2) of Regulation 10 of UERC (Conduct of Business) Regulations, 2014 in so far as the requirement of submission of documentary evidence with respect to the approval of BoD is concerned."*

3.15 *The Petitioner in its Petition has enclosed a DPR amounting to ₹ 23.47 Crore including taxes which has been prepared in-house and is approved by the Competent Authority for carrying out the works related to Refurbishment of Damaged Power Channel from Dakpathar Silt Ejector to Intake of Dhalipur Powerhouse. Further, the Petitioner has submitted that it shall arrange the expenditure on the said works from its internal resources and the total expenditure of Rs. 23.74 Crore will be incurred during the FY 2023-24."*

4. The Petitioner in its DPR has annexed the photographs of the damaged panels/linings/portions of the Power Channel alongwith the relevant cross-sectional drawings, which explicitly depicting the condition of Power Channel.

5. The Petitioner has also enclosed a report with regard to engagement of Department of Civil Engineering, IIT Roorkee for conducting evaluation/inspection of the canal lining works of silt ejector carried out with Geosynthetic Product namely Cementitious Composite Geosynthetic Mattress (CCGM) executed earlier at Dakpathar and Pashulok Barrage. Based on inspection and examination of various aspects of CCGM lining, Department of Civil Engineering, IIT Roorkee concluded that design of CCGM lining, quality and performance of the construction were in order and further, recommended that such CCGM lining should be used in similar cases of open channels. Accordingly, the Petitioner prepared the DPR of the works proposed in the instant Petition.

6. The Petitioner in its Petition has also elaborated the benefits of CCGM in open channel water conducting system as it consists of "*… a double layer high strength woven made of PET, with interwoven filter zones providing a concrete slab with an averaged overall thickness of approximately 100 mm after filling with highly fluid concrete. The filter zone releases the back water pressure and the concrete slab provides the strength and stability to canal lining. Lining of canals reduces the seepage appreciably and thus prevents the occurrence of water logging condition. The installation of CCGM does not required vertical and horizontal band if laid in continuous length, hence, the installation rate is faster than conventional lining methods. The Rugosity co-efficient of CCGM is lesser than the stone pitching, therefore, it will increase the hydraulic efficiency of power channel.*

…

CCGM will provide the stability of side slopes of power channel lying in the cutting portion against the: -

- *Frequent drawdown of water in the power channel.*
- *Back water pressure at the deepest point by releasing the water from inbuilt filter zones.*

- *Weed growth"*

7. The scope of work proposed by the Petitioner for Refurbishment of Damaged Power Channel below Full Supply Level (FSL) includes following activities:

"

(1) *Dismantling of old damaged panels and laying filter material over the prepared surface,*

(2) *Providing PCC M20 toe wall to support the panel lining.*

(3) *Laying of a geo textile filter between pitching and embankment slopes on which pitching is laid to prevent escape of the embankment material.*

(4) *Laying hand packed stone over the geo textile filter for lesser cavities to allow free movement of water without creating any water pressure.*

(5) *Laying M20 pervious cement concrete over the geo-textile filter for deeper cavities/undulation in side slopes to allow free movement of water without creating any water pressure.*

(6) *Installation of CCGM (100 mm thick after filling concrete)- Cementitious Concrete Geosynthetic Mattress with intermittent filter points to release the pore water pressure over the hand packed stone/M20 pervious concrete as per the channel profile.*

(7) *Filling CCGM with M20 grade concrete.*

(8) *Micro Alloyed Cement Concrete (M-40 and above grade) work for Repair of Concrete tile with application of bonding agent.*

(9) *Providing mechanically woven double twisted hexagonal Wire mesh gabion filled with boulder as per the requirement.*

(10) *Removal of muck from the bed of Power Channel.*

(11) *Miscellaneous work as per the requirement."*

8. The estimated cost for carrying out the capital investment on Refurbishment of Damaged Power Channel from Dakpathar Silt Ejector to Intake of Dhalipur Power Plant is summarized as under: -

Sl. No.	Description of work	Estimated Cost with GST @ 18 % (Rs. in Crore)
	Work below the FSL of power channel (To be carried out during closure)	
1.	Refurbishment of Damaged Power Channel from Dakpathar silt ejector to Bhimawala Bridge. (Total length of 1600 m out of 12500 m on both sides to be treated)	1.22
2.	Refurbishment of Damaged Power Channel from Bhimawala Bridge to Court Bridge. (Total length of 900 m out of 6000 m on both sides to be treated)	9.59
3.	Refurbishment of Damaged Power Channel from Court Bridge up to Skew Bridge. (Total length of 1100 m out of 6000 m on both sides to be treated)	11.85
4.	Refurbishment of Damaged Power Channel from Skew Bridge to Intake of Dhalipur Power Plant. (Total length of 300 m out of 3500 m on both sides to be treated)	0.81
	Sub Total	**23.47**

9. The Petitioner in its DPR of the aforesaid works under the Cost Benefit Analysis has mentioned that following benefits shall be achieved from the proposed capital works: -

"

1. *Ensure the safety of power channel and help to avoid its further deterioration/damages. Thus, limiting the damages vis-à-vis refurbishment cost.*
2. *Help in arranging the expert working agency with the desired quantity of manpower, material etc well within planned time and in a proper (open tender process) manner. Thus avoiding any additional generation loss.*
3. *…*
4. *Help to maintain the efficacy of power channel.*
5. *Mitigate the risk of force closure/sudden failure of power channel.*

6. *Avoid unexpected generation loss as a consequence of force closure/sudden failure of power channel."*

10. In the meantime, UJVN Ltd. vide its letter dated 28.01.2023 submitted that it is planning to execute the works proposed in the Petition in next 3-4 months, which is lean discharge period and therefore, requested the Commission to kindly consider the proposal at the earliest for planning of shutdown from SLDC & UPCL.

11. On examination of the Petition & DPR certain deficiencies/infirmities were identified and accordingly, the Commission vide its letter No. 1473 dated 03.03.2023 directed the Petitioner to submit/furnish its compliance on the following latest by 24.03.2023: -

"

1. *UJVN Ltd. is required to submit the details of major civil works carried out for the refurbishment/repair of power channel from Dakpathar Silt Ejector to intake of Dhalipur powerhouse during last 15 years in the following format:*

S. No.	*Name of the major civil works*	*Duration of work*		*Details of work executed*		
		Start date	*Completion date*	*Name of the executed work*	*Location in power channel where the work has been executed*	*Present condition of the executed work*
1						
…						

2. *UJVN Ltd. is required to confirm the section-wise details of Power Channel which are common in the instant Petition and were also covered in the major civil works executed in March-April 2017 amounting to Rs. 17.36 Crore/under DRIP works.*

3. *UJVN Ltd. is required to submit whether any effort has been made by it for funding of the proposed works through Centrally funded scheme/soft loan as done in other States.*

4. *UJVN Ltd. is required to furnish a typical cross section drawing of the Power Channel showing the elevation levels at Bhimawala Bridge, Court Bridge, Skew*

Bridge, Dakpathar Silt Ejector and intake of Dhalipur Power House separately. The said drawings should be legible, clearly depicting the width of power channel at bottom, FSL and top of power channel, slope of panels, depth of concreting."

12. In compliance to the above observations of the Commission, UJVN Ltd. vide its letter No. M-25/UJVNL/02/D(O)/GM(Comm.) dated 27.03.2023 submitted its point-wise reply as mentioned below: -

"

1. Details of major civil works carried out for the refurbishment/repair of power channel from Dakpathar silt ejector to intake of Dhalipur power house during last 15 years

S.No.	*Name of the major civil works*	*Duration of work*		*Details of work executed*		
		Start date	*Completion date*	*Name of the executed work*	*Location in power channel where the work has been executed*	*Present condition of the executed work*
1	*Repair of Damaged Panels of Power Channel from Silt Ejector at Dakpathar upto intake of Dhakrani Power House during closure.*	*15.03.2017*	*05.06.2017*	*Cement concrete work, Wire Crate, Plum Concrete, Boulder Pitching etc.*	*Cement concrete works was done in Toe wall/ Horizontal and Vertical Bends and tile repair work. Wire Crate, Plum Concrete and Boulder pitching were provided in side slope panel of power channel.*	*Side panel of power channel is Partially damaged. Concrete tile at some location has been eroded.*
2	*Repair of Damaged Panels of Power Channel from Dhakrani Power House upto 0.60 km Downstream of Dhakrani Power House during closure.*	*07.03.2017*	*07.06.2017*	*Dewatering Cement concrete work, Wire Crate, Plum Concrete, Boulder Pitching etc*	*Dewatering was done to expel the water from bed of power channel. Cement concrete works was done in Toe wall/ Horizontal and Vertical Bends and tile repair work. Wire Crate, Plum Concrete and Boulder pitching were provided in side slope panel of power channel.*	*Partially/ fully damaged*
3	*Repair of Damaged Panels of Power Channel from 0.60 km downstream of Dhakrani Power House upto 2.2 km downstream of Dhakrani Power House during closure.*	*15.03.2017*	*18.02.2018*	*Dewatering Cement concrete work, Wire Crate, Plum Concrete, Boulder Pitching etc*	*Dewatering was done to expel the water from bed of power channel. Cement concrete works was done in Toe wall/ Horizontal and Vertical Bends and tile repair work. Wire Crate, Plum Concrete and Boulder pitching were provided in side slope panel of power channel.*	*Partially/ fully damaged*

4	*Repair of Damaged Panels of Power Channel from 2.2 km downstream of Dhakrani Power House upto Skew Bridge at Dhalipur during closure.*	*15.03.2017*	*07.06.2017*	*Cement concrete work, Wire Crate, Plum Concrete, Boulder Pitching etc.*	*Cement concrete works was done in Toe wall/ Horizontal and Vertical Bends and tile repair work. Wire Crate, Plum Concrete and Boulder pitching were provided in side slope panel of power channel.*	*Side panel of power channel is Partially damaged. Concrete tile at some location has been eroded.*
5	*Repair of Damaged Panels of Power Channel from Skew Bridge Dhalipur to Intake of Dhalipur Power House during closure.*	*14.03.2017*	*07.06.2017*	*Cement concrete work, Wire Crate, Plum Concrete, Boulder Pitching etc.*	*Cement concrete works was done in Toe wall/ Horizontal and Vertical Bends and tile repair work. Wire Crate, Plum Concrete and Boulder pitching were provided in side slope panel of power channel.*	*Side panel of power channel is Partially damaged. Concrete tile at some location has been eroded.*

2. *During closure in the year 2017, the repair works were carried out in the damaged portion of power channel between Dakpathar silt ejector to intake of Dhalipur Power House. The power channel is in continuous service since last 06 years. No major civil works has been carried out since last closure. Some panels repaired in the year 2017 have either partially or fully damaged. Apart from this, there are some newly damaged panels also. The instant petition covers the repair of panels which are in damaged condition at present.*

3. *World Bank/CPMU/CWC did not consider the power channel work associated with Dam/Barrage safety, therefore the power channel works were not considered in DRIP-II & III.*

4. *The section of power channel is almost same at its entire length. Available cross section near Court Bridge is attached as Annexure-I & II. Cross section near Skew Bridge is attached as Annexure-III & IV."*

13. Further, an e-mail dated 06.04.2023 was sent to the Petitioner for furnishing information w.r.t. the chainage-wise/panel-wise works executed under DRIP-I scheme between Dakpathar Barrage to intake of Dhalipur Power Plant.

14. In reply to the e-mail dated 06.04.2023, the Petitioner vide its submission dated 11.04.2023 furnished the details of panels/reach where the works under the DRIP-I scheme were executed between Dakpathar barrage to intake of Dhalipur Power

Plant alongwith tentative current condition of the Panels requiring refurbishment.

Commission's Observations, Views & Directions: -

15. Based on the examination and analysis of the Petition & subsequent submissions and observations made during site visit by officers of the Commission, it has been observed that:

(1) Side slopes at many locations in the cutting portions of the Power Channel have partially/completely collapsed resulting in damaging of profile of the side slopes and lining of the Power Channel. Besides the cutting portion, some damages have also been observed in the filling portion such as damaged lining, erosion of concrete tiles etc. The aforesaid damages in the Power Channel calls for refurbishment of the damaged panels for ensuring safety and maximum operational availability of the Power Channel for uninterrupted power generation from the Plants.

(2) The works carried out by the Petitioner in the year 2017 under DRIP-I scheme were done with use of cement concrete and wire-crate, however, with passage of time i.e., continuous operation of Power Channel during last 6 years, some of the panels/linings have again damaged/eroded in absence of approval of closure for repair & maintenance.

(3) Department of Civil Engineering, IIT Roorkee as an expert agency has made some suggestions and recommended that the lining works in open channels should be carried out with use of CCGM. A success story of similar works carried out in main canal of Taladanda (Odisha) has also been annexed in the DPR, justifying the use of CCGM in lining work of Power Channel.

(4) Based on the past experience and recommendations of IIT Roorkee, the Petitioner has submitted to execute the proposed works with use of Geosynthetic product namely CCGM. In order to avoid recurrence of damages, the Commission cautions the Petitioner that before execution of

the proposed works, it should explore all aspects with regard to quality and durability.

(5) The Petitioner has proposed to arrange the expenditure for the proposed works through its internal resources.

16. The proposed works in the instant Petition should be executed during the lean discharge period for minimising the generation loss. Further, the Petitioner is advised to take prior consent/approval from UPCL/SLDC pertaining to the shutdown of the affected Power Plants namely Dhakrani, Dhalipur & Kulhal.

17. It is known that the Power Channel is an essential link in hydro-power generation and in order to maintain continuity of power generation, it calls for regular monitoring/maintenance and upkeeping of its water conducting parts viz. side panels, linings etc. Therefore, the Petitioner should identify even the minor events, which may become key cause for generation loss in future, and rectify such causes promptly. This approach would not only help in minimizing the generation loss but also save/defer major expenditure in future.

Further, it has also been observed that accumulation of waste/debris due to disposal by the local people is rampant on both sides of the Power Channel, which should immediately be stopped, and towards permanent resolution of the menace, suitable eco-friendly alternative should be arranged by the Petitioner in the interest of safety of the Power Channel as well as generation from the Plants situated in downstream.

18. Based on the above discussions and considering the safety of the Power Channel as well as the Power Plants in the downstream, the Commission grants in-principle approval for the proposed works.

The in-principle approval is being granted subject to the following:

(1) The Petitioner should go for the competitive bidding for obtaining the most economical prices from the bidders.

(2) The Petitioner should execute the proposed works duly considering the observations/suggestions/recommendations of IIT Roorkee and ensure that the works should be executed with quality and durability.

(3) The Commission may verify/check the proposed works to be executed by the Petitioner at any point of time during/post execution of the works from the perspective of Quality, Optimum utilization of resources, Benefits accrued from the proposed investments etc.

(4) The Petitioner must submit the detailed sanctioned letter from the Financial Institution, if any, to the Commission as soon as they get approval from the Financial Institution. All the loan conditions as may be laid down by the funding agency, if any, in their detailed sanction letter should be strictly complied with. However, the Petitioner is directed to explore the possibility of swapping the loan with cheaper debt option if any, available in the market etc.

(5) The Petitioner shall, within one month of the Order, submit letter from the State Government or any such documentary evidence in support of its claim for equity funding, if any, agreed by the State Government or any other source in respect of the said works.

(6) On completion of the project, the Petitioner shall submit the completed cost of each of the works with as built drawings, list of chainage-wise/panel-wise details of works executed alongwith expenditure incurred and financing of the project.

(7) The cost of the project and servicing on the same shall be allowed in the Annual Fixed Cost of the Petitioner after the assets are capitalized and subject to prudence check of the cost incurred.

Ordered accordingly.

(M.K. Jain)
Member (Technical)

(D.P. Gairola)
Member (Law) /Chairman (I/c)