

Before
UTTARAKHAND ELECTRICITY REGULATORY COMMISSION

Petition No. 30 of 2021

In the Matter of:

Petition for in-principle approval of capital investment under DRIP-II for strengthening and up-gradation of 6 Dams/Barrages i.e. Ichari Dam, **Maneri Dam**, **Joshiyara Barrage**, Asan Barrage, Dakpathar Barrage and Virbhadra Barrage of UJVN Ltd. under Section 61 and 86 of the Electricity Act, 2003 read with the relevant regulations and guidelines of the Commission.

And

In the Matter of:

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

...Petitioner

Coram

Shri D.P. Gairola Member (Law)

Shri M.K.Jain Member (Technical)

Date of Order: October 12, 2021

ORDER

This Order relates to the Petition filed by UJVN Ltd. (hereinafter referred to as "UJVN Ltd" or "the Petitioner") under Section 61 and 86 of the Electricity Act, 2003 read with Regulation 23 'Renovation and Modernization' of UERC (Terms and Conditions for Determination of Multi Year Tariff) Regulations, 2018 (hereinafter referred to as MYT Regulations, 2018) and provisions of UERC (Conduct of Business) Regulations, 2014 for seeking in-principle approval of capital investment under Dam Rehabilitation & Improvement Program (DRIP-II) for strengthening and up-gradation of 6

Dams/Barrages i.e. Ichari Dam, Maneri Dam, Joshiyara Barrage, Asan Barrage, Dakpathar Barrage and Virbhadra Barrage of UJVN Ltd.

However, on the request and urgency shown by the Petitioner the works pertaining to Maneri Dam and Joshiyara Barrage covered under DRIP-II Scheme have been analyzed on priority. Accordingly, this Order is part Order of the 'Petition for seeking in-principle approval of capital investment under Dam Rehabilitation & Improvement Program (DRIP-II) for strengthening and up-gradation of 6 Dams/Barrages i.e. Ichari Dam, Maneri Dam, Joshiyara Barrage, Asan Barrage, Dakpathar Barrage and Virbhadra Barrage of UJVN Ltd.' delving with the works proposed under DRIP-II Scheme for the Maneri Dam and Joshiyara Barrage only.

A separate Order shall be issued for the DRIP-II Scheme pertaining to works of Ichari Dam, Asan Barrage, Dakpathar Barrage and Virbhadra Barrage of UJVN Ltd.

Background

2. UJVN Ltd. vide its letter No. 28/UJVNL/03/D(P)/ dated 25.06.2021 had filed an Application under Section 61 and 86 of the Electricity Act, 2003 read with Regulation 23 of MYT Regulations, 2018 and provisions of UERC (Conduct of Business) Regulations, 2014 seeking approval in the matter of Petition for in-principle approval of capital investment under DRIP-II for strengthening and up-gradation of 6 Dams/Barrages i.e. Ichari Dam, Maneri Dam, Joshiyara Barrage, Asan Barrage, Dakpathar Barrage and Virbhadra Barrage.
3. The Petitioner in its Petition has furnished that:-
 - (1) The Central Water Commission (CWC) with assistance of World Bank had initiated a programme called "Dam Rehabilitation and Improvement Project (DRIP)" for the strengthening and up-gradation to ensure safety of existing Dam/Barrages. Dam Rehabilitation and Improvement Project (DRIP) was started in 2011 but UJVN Limited was included in July 2015 with five Dams/Barrages namely Ichari Dam Maneri Dam, Asan Barrage, Dakpathar Barrage and Virbhadra Barrage under DRIP-I amounting to Rs. 235 Cr.
 - (2) UJVN Limited has also been allowed for carrying out the works proposed under DRIP-II Scheme. In the proposal of works under DRIP-II, the

remaining works of all the 5 Dams/ Barrages proposed under DRIP-I and all works of Joshiyara Barrage have been included.

- (3) The Petitioner had earlier filed its proposals of Rs. 432 Crore covered under DRIP-II for approval of the Commission vide its letter no. M-130/UJVNL/02/D(O)/B-8 dated 27.01.2021 during the tariff proceedings for FY 2021-22. The Commission had found the works covered under DRIP-II of Renovation & Modernization nature and informed the Petitioner to file a Petition before the Commission under the provisions of Regulation 23 of UERC (Terms and Conditions for Determination of Multi Year Tariff) Regulations, 2018. Further, the Commission at para 5.9.2 of its Tariff Order dated 26.04.2021 directed the Petitioner to approach the Commission with a separate detailed proposal for approval of the additional capitalization on account of the works to be executed under DRIP-II and DRIP-III.
- (4) The Detailed Project Report for 'strengthening and up-gradation of 6 Dams/Barrages i.e. Ichari Dam, Maneri Dam, Joshiyara Barrage, Asan Barrage, Dakpathar Barrage and Virbhadrha Barrage' has been prepared by the Petitioner in-house and approved by the Board of Directors of the Petitioner during the BOD meeting held on 24.06.2021.
- (5) The details of estimated expenditure in DPRs of all 6 Dams/ Barrages covered under DRIP-II is tabulated as under:

S. No.	Name of Dam/barrage	Cost of DPR (Rs. Cr)		
		Part A (approved by World Bank)	Part B (proposed, if additional budget available)	Total (A+B)
1-	Ichari Dam	35.69	14.72	50.41
2-	Dakpathar barrage	39.24	24.21	63.45
3-	Asan barrage	28.62	0.00	28.62
4-	Virbhadrha barrage	45.26	41.46	86.72
5-	Maneri Dam	72.29	15.09	87.38
6-	Joshiyara barrage	53.31	62.21	115.52
	Total	274.40	157.69	432.09

4. UJVN Ltd. has submitted that the proposed works might not give any direct generation benefits but are likely to increase life of the project with enhancement in the safety level of the dam/barrage operation. However, the benefit to cost analysis has been worked out on the basis of assumptions as given in the DPRs.
5. The Petitioner in its Petition has furnished that Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, New Delhi vide its letter dated 30.03.2021 addressed to Chief Secretary, Govt. of Uttarakhand directed that the Petitioner essentially needs to award the bids for civil works contract worth at least 30% of the project cost, which is approx. Rs 83 Crore to meet the Project Readiness Criteria (PRC) before signing of loan agreement. In the virtual meeting held on 15.06.2021, Central Project Monitoring Unit (CPMU)/World Bank communicated that meeting for signing loan agreement is scheduled on 28.06.2021. Therefore, it is obligatory for the Petitioner to award the work of minimum Rs 83 Crore before signing of loan agreement. The following civil works are on priority as the same are considered for fulfillment of the desired formalities of the PRC:-
 - (1) Construction of the energy dissipation arrangements in the downstream of Maneri Dam amounting to Rs. 65.82 Cr.
 - (2) Construction of protection wall upstream of Maneri dam near Model Inter College at right bank along the reservoir rim to prevent erosion during floods amounting to Rs. 7.51 Cr.
 - (3) Construction of cut-off drain/Seepage drains at right bank of Joshiyara Barrage reservoir area of MB-II project (Uttarkashi) to prevent seepage/leakage of water from reservoir through right bank of barrage amounting to Rs. 13.64 Cr.
6. The Petitioner has also furnished that it has become obligatory for him to award the work of Rs. 83 Crore prior to loan agreement signing date i.e. by 28.06.2021 to meet the PRC.
7. The instant Order is a part Order pertaining to Maneri Dam and Joshiyara Barrage. Hence, the cost break-up of the works proposed under DRIP-II for Maneri Dam

and Joshiyara Barrage of UJVN Ltd. as provided in Petition are only detailed below:-

(1) **Maneri Dam**

PART-A: - Detail of works under DRIP-II for Maneri Dam, MB-I Project is summarized below:

<u>S. No</u>	<u>Description</u>	<i>Estimated Amount (Rs in Lacs) & inclusive GST</i>
1	<i>Construction of the energy dissipation systems in the d/s of Maneri Dam as per the recommendations of model studies.</i>	6155.00
2	<i>Construction of protection wall in the vicinity of Model Inter College towards downstream at right bank along the reservoir rim to prevent erosion during floods.</i>	750.89
3	<i>Consultancy works related to review of dam design & its appurtenant structures.</i>	100.00
4	<i>New trash rack panels with protective coating at Power Intake</i>	109.86
5	<i>Replacement of Steel Wire Rope 45mmDia with socket pin etc.</i>	66.68
6	<i>Procurement of a suitable vehicle for public announcement and other purpose for Maneri Dam</i>	8.89
7	<i>Procurement of 250 KVA DG set for Maneri Dam.</i>	37.65
	Total Part A	7228.97 Say Rs 72.29Cr
PART B: Details of works are to be taken up in second phase if additional budget is allocated to UJVNL for DRIP II/III		
8	<i>*Replacement/repair of damaged steel liner/plate on piers/glacis of spillway. Repair of damaged piers on upstream side using high performance concrete.</i>	300.00
9	<i>*Reaming & re-drilling of drainage holes inside foundation gallery.</i>	15.55
10	<i>Petrographic analysis for the suspended sediments and chemical analysis of the water in the immediate vicinity of the Dam on the upstream.</i>	14.75
11	<i>Construction/Development of Tourist Convenience Centre, Boat Club and Rafting Centre at Maneri dam site.</i>	230.65
12	<i>*Repair of damaged flushing conduit tunnel & sedimentation chamber</i>	300.00

<u>S. No</u>	<i>Description</i>	<i>Estimated Amount (Rs in Lacs) & inclusive GST</i>
13	<i>Collection of all the available project records like drawings, designs, reports, documents etc. from all sources and their digitization.</i>	20.00
14	<i>Construction of visitor room near Dam top.</i>	100.00
15	<i>Construction/repair of roads at Maneri dam site</i>	180.00
16	<i>Renovation/construction of type-II/III/IV building including the development of basic facility as per the bare minimum requirement of O&M staff.</i>	300.00
17	<i>Procurement of three No of Vehicles for Maneri Dam for Project related works.</i>	48.00
	Total (Part B)	1508.95 Say 15.09 Cr
	Total (Part A + Part B)	8737.92 Say Rs 87.38 Cr
	<i>*Works at s. no. 8, 9 & 12 of part-B have also approved by World Bank for DRIP-II. But to keep the limit of Rs 274 Cr in Part A, these works are kept in Part B and proposed to be executed, if additional budget is available in DRIP-II OR by internal resources of UJVNL.</i>	

During PST approval process from World Bank/CPMU changes were made in priority work and accordingly modifications have been made in DPR proposal and works allowed by World Bank in PST have been listed under part A & remaining works are in part B.

(2) **Joshiyara Barrage**

PART A: Detail of works under DRIP-II for Joshiyara Barrage, MB-II Project is summarized below:

<u>S. No</u>	<i>Description</i>	<i>Estimated Amount (Rs in Lacs) & inclusive GST</i>
1(a)	<i>Reconstruction of Energy Dissipation Arrangements.</i>	3000.00
1(b)	<i>Model study for existing & proposed Energy Dissipation Arrangements at d/s of Joshiyara Barrage.</i>	74.87
1(c)	<i>Design consultancy for finalized EDA.</i>	15.16
2	<i>Construction of cut-off drain/Seepage drains at right bank of Joshiyara Barrage reservoir area of MB-II project (Uttarkashi) towards to prevent seepage/leakage of water from reservoir through right bank of barrage.</i>	1363.84

S. No	Description	Estimated Amount (Rs in Lacs) & inclusive GST
3	Alignment of the guides of the stop log (Repair/Replacement of damaged guide tracks of 05 Nos. stop log gates.	41.00
4	Replacement of 01 no. damaged stop log unit.	53.15
5	Replacement of damaged bottom seal and side seal of 05 no. radial gate.	40.77
6	Procurement (SITC) of Trash Rack Cleaning Machine.	741.31
	Total Part A	5330.10 Say Rs 53.31Cr
PART B: Details of works are to be taken up in second phase if additional budget is allocated to UJVNL for DRIP II/III		
7	Third party quality control & supervision work through reputed Agency like NCCBM, CSMRs etc for re-construction of EDA work*	40.00
8	Consultancy works related to review of Barrage design & its appurtenant structures, hydrographic survey, Capacity survey, submergence area, development of tourist convenience center etc*	60.00
9	Removal of accumulated RBM at downstream of barrage*	125.00
10	Reaming & re-drilling of drainage holes inside foundation gallery of Joshियारा barrage*	80.00
11	Treatment of cracks in Barrage piers & other associated structures of barrage.	325.00
12	Installation of required instruments for safety of barrage.	100.00
13	Construction/repair of CC road from Manera by Pass to Flushing Conduit & U/S of Joshियारा Barrage.	354.00
14	Construction/provision of additional back regulator TRC gates at Dharasu Power House site.	1500.00
15	Expansion/modification in cavern of Valve House Chamber of MB-II project at Dharasu.	946.00
16	Construction of type II/III building including the development of basic facility as per the bare minimum requirement of O&M staff at Joshियारा.	680.00
17	Collection of all the available project records like drawings, designs, reports, etc from all sources and their digitization.	30.00
18	Construction and Supply basic drinking water facilities for O&M staff at Joshियारा.	130.00

S. No	Description	Estimated Amount (Rs in Lacs) & inclusive GST
19	Construction/Development of Tourist Convenience Centre, Boat Club and Rafting Centre at U/S of Joshiyara Barrage site.	1011.00
20	Repair of Flap gate at radial gate no. 01.	98.20
21	Contingency to meet out the unforeseen site situation, variation etc.	742.70
	Total Part B	6221.90 Say 62.21 Cr
	Total (Part A + Part B)	11552.00 Say Rs 115.52 Cr
*Works at s. no. 7, 8, 9, 10 have also approved by World Bank for DRIP-II. But to keep the limit of Rs 274 Cr in Part A, these works are shifted in Part B and proposed to be executed, if additional budget is available in DRIP-II OR by internal resources of UJVNL		

In works of Joshiyara barrage of value amounting to Rs 115.52Cr, the works of part A amounting to Rs 53.31 Cr shall be taken up first on priority basis as fund allocation is available under DRIP-II and remaining works in part B of value Rs 62.21 Cr shall be taken up either after approval of CPMU/World Bank or from internal resources, under intimation to Hon'ble UERC. The Hon'ble Commission is requested to take note of this.

8. With regard to Financing Plan of the total project cost of Rs. 432 Crore, the Petitioner has submitted that as per DRIP funding plan informed by GoI, 20% of the total cost i.e. Rs. 86.4 Crore is to be arranged as equity and rest 80% of the total cost i.e. Rs. 345.60 Crore shall be grant/loan. Further, 90% of the said grant/loan component or 72 % of the total cost i.e. Rs. 311.04 Crore is to be transferred to GoU as grant from GoI and rest 8% of the total cost i.e. Rs. 34.56 Crore is to be arranged as loan. UJVNL Ltd. has made formal communication with GoU vide letter no. 415/UJVNL/01/MD/DRIP dated 29.01.2021 for transfer of 72% grant from GoI directly to the UJVNL Ltd. The decision on the same is awaited from GoU.

However, as per modified condition by GoU for DRIP-II amounting to Rs. 432 Crore, 20 % equity shall have to be borne by UJVNL Ltd. So, the revised funding plan for DRIP-II works has been revised and is as given below:

(Rs. In Crore)

Cost for DRIP-II	Counterpart funding(Equity 20 % of Rs. 432) to be borne by UJVNL Ltd.	Loan component @ 80% (as interest free loan)
432	86.40	345.60

9. With regard to Phasing of investment, the Petitioner has submitted that the total tenure of the DRIP-II/DRIP-III is 10 years & main fund requirements will be in initial 4-5 years, therefore, the Petitioner have to invest about Rs. 13-14 Crore yearly in four consecutive financial years. However, for remaining works, action will be taken in subsequent years after allocation of additional fund by CPMU/World Bank.
10. Accordingly, the Petitioner has requested the Commission to approve the total capital investment of ₹ 432.09 Crore under DRIP-II for strengthening and up-gradation of 6 Dams/Barrages i.e. Ichari Dam, Maneri Dam, Joshiyara Barrage, Asan Barrage, Dakpathar Barrage and Virbhadra Barrage of the Petitioner.
11. While examining the Petition, the Commission has observed that the Petitioner has sought expeditious decision of the Commission for the works amounting to Rs 83 Crore at Maneri Dam & Joshiyara Barrage which have been taken up for satisfying the Project Readiness Criteria of Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, New Delhi letter dated 30-03-2021. Accordingly, the Commission decided to scrutinize the works proposed under DRIP-II scheme for Maneri Dam and Joshiyara Barrage on priority considering the timely availability of funds issuance from the GoI.
12. On examination of the DPRs of Maneri Dam & Joshiyara Barrage certain deficiencies/infirmities and requirement of additional information were identified and the Commission vide its letter No. 526 dated 10.09.2021 directed the Petitioner to submit/furnish its compliance on the following at the earliest:-

“

General Comments

1. *UJVN Ltd. is required to confirm that works covered under DRIP-II scheme works have not been proposed under any other previous works/schemes/deferred works.*
2. *UJVN Ltd. is required to furnish the reasons for including works viz. visitor room, tourist, convenience center etc. in DRIP works as the same could be executed through CSR activities too.*

Work Specific Comments

Maneri Dam

1. *With regard to construction of protection wall upstream of Maneri Dam of Rs. 7.50 Crore, UJVN Ltd. is required to confirm the length of protection wall approved by DSRP and that proposed by UJVN Ltd. in its Petition and in case of variation justification for the same is required to be furnished.*
2. *Further, UJVN Ltd. is required to clarify why steel reinforcement is not shown in tentative cross section of retaining wall.*
3. *With regard to expense of Rs 300 lakh against 'damaged steel liner/plate on piers/glacis', UJVN Ltd. is required to furnish a comparative statement of performance and longevity of Steel Plates vis-à-vis High Performance Cement concrete on piers/glacis.*
4. *Point-wise status of compliance on the comments of world bank mentioned at page no. 174 to page no. 177 of DPR are to be furnished.*
5. *With regard to, Energy Dissipation Arrangement (EDA) works at Maneri Dam, it has been noticed that a work of Rs 7.44 Crore was proposed against stilling basin at downstream of Maneri Dam and model studies of stilling basin of Rs 2.15 Crore were proposed under DRIP-1 scheme. In this regard, it is observed that during discussion of DRIP-1 works for MB-1, it was stated that the said works has been shifted to DRIP-2 scheme. The work of EDA now amounts to Rs 61.55 Crore in DRIP-2.*
UJVN Ltd. is required to clarify regarding the variation in proposed expenditure from Rs 7.44 Crore in DRIP-1 to Rs 61.55 Crore in DRIP-2 for stilling basin/EDA.
Further, UJVN Ltd. is also required to confirm the 'head' under which the expenditure against model studies for stilling basin have been included in DPR for DRIP-2 scheme.
6. *UJVN Ltd. is required to provide approved copy of model studies pertaining to EDA from Central Project Monitoring Unit (CPMU)/Central Water Commission (CWC).*
7. *UJVN Ltd. is required to confirm that the findings/observations/outcomes of the report against 'Consultancy works related to review of dam design & its appurtenant structures' shall not impact the works taken up for EDA of Rs 61.55 Crore.*
8. *UJVN Ltd. is required to confirm whether any agency for third party quality control & supervision work for re-construction of EDA has been appointed for EDA at Maneri Dam inline with the work proposed for EDA at Joshियारा Barrage, if yes, then under which 'head' the expenditure for the same has been covered.*

Joshियारा Barrage

1. *With regard to the construction of protection wall and seepage problem in adjoining areas of reservoir, UJVN Ltd. had carried out work under balance capital works of MB-2 approved by the Commission amounting to Rs 52.29 Crore. However, UJVN Ltd. has again proposed the works of 'Cut-off drain/seepage drain at right bank of Joshियारा barrage reservoir area of MB-II' stating the seepage problem in Gyansu area. UJVN Ltd. is required to justify repletion of the works in DRIP-2 scheme.*
Further, UJVN Ltd. has to confirm that post completion of the proposed works of 'Cut-off drain/seepage drain at right bank of Joshियारा barrage reservoir area of MB-II' the problem of water accumulation in low lands around Joshियारा Barrage at right bank would be resolved satisfactorily.

Moreover, UJVN Ltd. has to confirm that in the proposed design for 'Cut-off drain/seepage drain at right bank of Joshiyara barrage reservoir area of MB-II' adequate/effective provision for maintenance have been envisaged in the event of blockage in drain.

2. *UJVN Ltd. had incurred an expenditure of Rs 27.30 Crore against modification of tail race channel under balance capital works of MB-II and now again UJVN Ltd. is proposing an expenditure of Rs 15 Crore against Construction/provision of additional back regulator TRC gates at Dharasu Power House site.*

UJVN Ltd. has to clarify why the said works were not envisaged during the modification of TRC at MB-II and not addressed in the CFD analysis done for modification of tail race channel.

Further, UJVN Ltd. is also required to submit the basis for the proposed works i.e. CFD analysis/other detailed study for the proposed works.

3. *Point-wise status of compliance on the comments of world bank mentioned at page no. 271 to page no. 275 of DPR are to be furnished".*

13. In response, the Petitioner vide its letter dated 21.09.2021 submitted its compliance and furnished the following:-

- (1) With regard to 'General Comments' mentioned at point no. 12 above, following point-wise reply has been furnished by the Petitioner:-

"

1. *Previously in-principle approval was given by Hon'ble UERC for works under Sl. No. (1) & (2) of Maneri dam while approving RMU of MB-I but work could not be executed due to pendency of design related issues. However, in the present proposal scope of works and cost has been revised on the advice of Dam Safety Review Panel, which has experts from different domains including expert from the panel on the website of Dam Safety Organization, CWC and the revised proposal stands approved by CWC & World Bank. Work of construction of type-II/IV building for O&M staff Of MB-1 project under Sl No. (16) in part B was not concurred by Hon'ble Commission while approving RMU of MB-I. This work is again proposed as per actual requirement & DSRP has also recommended for the same in view of the need at Project.*

Beside above, it is to confirm that works of Maneri dam & Joshiyara barrage under DRIP-2 has not been brought before Hon'ble UERC under any other scheme. All these proposed works are as per recommendation of DSRP & essentially required to be executed for safety of dam /barrage and for smooth operation of power plant by O&M staff.

2. *The present scheme of DRIP-2 financed by World Bank has 4 major components:*

1. *Rehabilitation and Management Planning for Dams and Associated Appurtenances*
2. *Dam Safety Institutional Strengthening*
3. *Risk-informed Asset Management and Innovative Financing for Sustainable Operation and Maintenance of Dams*
4. *Project Management*

As per the policy of DRIP-2, the provision for development of alternative sources for generating revenue streams, such as tourism and water recreational activities, fisheries and other innovative schemes such as floating solar panels is to be kept at dam/barrage site under component 3 of the scheme. The relevant page no 23-24 of Project Appraisal Document of World Bank is attached as Annexure-1 in support of this. It is submitted that for this purpose, the land is already available around reservoir area. It will also create a source of secondary revenue generation for UJVNL. Work is proposed to be executed with due consultation of District Authority, Uttarkashi. This work has been allowed under DRIP-II/III there for has been included under the programme. There are many other public welfare activity which can be taken up under CSR. Therefore these works has been included in DRIP-II/III to have minimum financial burden.

- (2) With regard to 'Work Specific Comments' pertaining to Maneri Dam mentioned at point no. 12 above, following point-wise reply has been furnished by the Petitioner :-

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1. *The two photograph on Google map attached on page no 26 & 57 of DPR are showing two different lengths viz 200m & 400 respectively. As per actual measurement on ground the length of proposed protection wall is approx. 200mand the same is being proposed in the instant petition.*

The estimated quantity of steel reinforcement has taken LS on % basis of concrete volume to take care of temperature reinforcement. After detailed design calculation, the reinforcement shall be shown in construction drawing. The work shall be executed on the basis of construction drawing approved by competent authority.

2. *This repair work is covered in three different parts-*
 1. *Repair of damaged steel plate of piers*
 2. *Repair of damaged steel plates on spillway glacis no 1 & 2*
 3. *Repair of damaged surface of piers on upstream side under the reservoir water with high performance concrete*

The spillway glacis no 3 & 4 was repaired with M90 HPC in 2018 & 2019 respectively. After passing two monsoon periods, it is noticed that performance of M90 HPC on glacis suffice the requirement & surface of glacis are satisfactory after passing 2-3 floods.

Spillway glacis no 1 & 2 has already fixed with steel plates. At present only damaged fractured plate on glacis no 1, 2 and on downstream piers, which is comparatively lesser are proposed to be replaced by fresh steel plates. Replacement of entire steel plate by M90 HPC on glacis 1 & 2 is not required now as it will involve extra cost and it will not be economical in present condition. Decision on this has been taken after consultation with DSRP.

3. *Point-wise status of compliance on the comments of World Bank mentioned at page No. 174 to page No. 177 of DPR is attached as Annexure-2.*
4. *In the initial submission of DRIP-1 proposal before Hon'ble Commission, the proposal of construction of stilling was based on very preliminary estimate & was confined within the dimension of existing roller bucket. The cutting of protruding hill cliff & construction of training wall in extended portion was not included in the estimate. Later on, as per tentative design based on HEC-RAS modeling the length & seating level of proposed stilling basin has been revised by CPMU, CWC, DRIP. CPMU also directed that the top layer of the basin should be constructed with M90 concrete to resist the abrasion action of rolling boulders & silt laden flood water. Due to increase in length of stilling basin, the construction of training wall is also required on both banks of basin. These modifications in design were essential to satisfy the design requirements, which increase the scope of work. These enhance the estimated cost of work to Rs 61.55 Cr.*

It is also submitted that after bidding the L-1 bidder has quoted Rs 65.82 Cr (including GST) for this work. The financial approval of Rs 65.82 Cr for this work has also been concurred by CPMU, CWC & approved by UJVNL Board. Conditional acceptance letter has also been issued to the L-1 bidder M/s JV of M/s Alpha Pacific Systems Pvt. Ltd., B-1 DSIDC Industrial complex, Kirti Nagar, New Delhi and M/s APS Hydro Pvt. Ltd. 10/58 ,1st, Floor, Kirti Nagar, New Delhi with condition that work shall be started after the requisite consent of UERC (Annexure-3).

The model study work is not included in DRIP-2 DPR, as this work was already been taken up in DRIP-1 under guidance/approval of CPMU. The total expenditure incurred on this study in DRIP-1 is Rs 53 lacs, which have already booked under capital head of MB-I.

5. *The physical model study works as per direction of CPMU, CWC has been completed at Irrigation Research Institute, Bahadarbad, Roorkee. Final report is under preparation at IRI and the same shall be submitted to CPMU for vetting/approval. Thereafter, the construction drawing shall be submitted to CPMU for approval. In the bid of stilling basin approved by CPMU, provision has been incorporated that "GCC 15.1 Any structural / layout changes in the stilling basin based on the final outcome of physical modeling, which is under progress, would be incorporated during the execution of works by the Contractor". Copy of model study shall be submitted to Hon'ble Commission just after approval of the same from CPMU, CWC.*

6. *The existing design capacity of spillway is 5000 cumec. So, the design of EDA is also being taken for same discharge of 5000 cumec after consent from CWC. The work of EDA is being taken up in close coordination with CPMU & requisite approval of CPMU, DRIP, CWC will be sought for execution of this work. Findings/observations/suggestion of CPMU/World Bank after review of dam design shall be duly complied & will be incorporated in the execution dam/spillway/EDA to ensure improvement in dam health.*
7. *Reputed Agency like National Council for Cement and Building Materials, Govt of India, Ballabhgarh, Haryana, Central Soil and Materials Research Station, Govt of India, New Delhi etc is proposed to be appointed as third party for quality control & supervision work as per direction of CPMU, CWC. The cost of this proposed consultancy work at estimated cost of Rs 40 lacs has covered under consultancy work at Sl No. 3 in Part A DRIP-2 of Maneri dam. The details are given on page no 60 of DPR of Maneri Dam.*

(3) With regard to 'Work Specific Comments' pertaining to Joshiyara Barrage mentioned at point no. 12 above, following point-wise reply has been furnished by the Petitioner:-

“

1. *It is confirm that, the proposed work of “Construction of cut-off drain/Seepage drains & grouting work at right bank of Joshiyara Barrage reservoir area to prevent seepage/leakage of water from reservoir through right bank of barrage to Gyansu village area “under DRIP-2 is entirely different work with as compared to the work of “Construction of protection wall along reservoir rim of Joshiyara barrage” executed earlier under “Balance Capital Work of MB-II”.*

The Gyansu village is located at right bank of reservoir, whereas the Joshiyara village is located at left bank of reservoir. Therefore this current proposal is altogether different in respect of location and need of protection.

Joshiyara Village Seepage Problem Due to Submergence in Reservoir Area.

In this matter the problem was that the 72 nos houses/land of Joshiyara villagers located at left bank was under submergence effect of Joshiyara reservoir upto level EL 1108 m. The problem was resolved by rehabilitation of these house and by construction a protection wall along the reservoir rim to protect the Joshiyara village area from reservoir area. This protection wall also helps the entire city area from high flood in Bhagirathi River during monsoon.

As per DPR the level of Joshiyara barrage reservoir should be El 1108 M and minimum level should be El 1103 M as per design for maximum generation from Dharasu Power houses.

There were 41 villagers whose houses/land (72 nos) was under submergence area of reservoir under level El 1108 m. In Feb 2008 project was commissioned by Irrigation Department keeping the reservoir level only at El 1104 M by rehabilitating some affected villagers and constructing a protection wall around reservoir rim. After commissioning in 2008 the project was handed over to UJVNL by Irrigation Department.

Though proposed maximum reservoir level is El 1108 M, but keeping in view the safety of houses/land the area around Joshiyara reservoir upto El 1110 M has declared as submergence area. All affected villagers under submergence area of EL 1110 M has been rehabilitated. Rest affected villagers has made their house again on their own land after raising the foundation above El 1110 M. After completion of rehabilitation of Joshiyara villagers in 2017, the level of reservoir was possible to operate at El 1108 M. Also due to flash flood of Aug 2012 & June 2013 the both river bank along reservoir were badly damaged. This protection wall also safeguards the entire area from flood.

Gyansu Basti Seepage Problem:

The seepage problem of Gyansu area is mainly due to the geological condition of right bank of reservoir area. As per geological report the right embankment of Joshiyara barrage & Gyansu Basti area is almost RBM. The seepage is taking place through the riverbed area below the existing foundation of protection wall. Whenever the reservoir level is higher than El 1105m the water percolates through RBM zone below the riverbed and emerges out at low lying area of Gyansu Bast. The cut-off drain constructed along the toe of the embankment is not arresting the entire seepage coming below the embankment. This creates lot of seepage problem to the cultivation field and residential houses of Gyansu villagers located at right bank. To resolve the problem, UJVNL sought advice from various experts viz, Geologist, TAC member and DSRP. Advices of member TAC and Geologist are attached as Annexure-4 & 5. On the basis of expert advice of DSRP and TAC member, it is proposed that a cut-off drain upto required depth will be constructed along with curtain grouting upto 10m below the river bed along right bank of reservoir near low lying area. This work will also improve the strength of right bank of Joshiyara barrage to counter the water thrust during high flood. The work is being taken up on advice of various experts of different domain under the guidance of CPMU, CWC. However, in such type of underground work in river valleys, there is always a chance of some uncertainty. If any problem still remains after completion of work, that shall also be further resolved in consultation with technical experts and CPMU, CWC.

The seepage water inside the cut-off drain will flow under gravity. To avoid blockage, manholes at suitable location is proposed to be constructed for maintenance & cleaning of drain.

It is also submitted that on the basis of approved bid document by CPMU, CWC, e-bid for this work was invited. After bidding the L-1 bidder has quoted

Rs 13.53 Cr (including GST) for this work. Conditional acceptance letter has also been issued to the L-1 bidder M/s Starcon Infra Projects(I) Pvt. Ltd., C-101-102, IIInd, floor, Lajpat Nagar-I, Near Defence Colony, Flyover Market, New Delhi -110024 with condition that work shall be started after the requisite consent of UERC (Annexure-6).

2. *Detailed study report along with CFD analysis and experts' advice will be submitted before Hon'ble Commission prior to start of this work.*

In the CFD analysis done earlier, the scope of study was limited to water flow from machine and their impact on front TRC wall to know the reasons of vibration in machine. The back regulator gate & river reach was not part of that analysis. Earlier analysis was focused on the causes in machine vibration beyond the permissible limit by back water pressure inside TRC due to wall alignment.

In present problem the CFD analysis of TRC, back regulator gate and required length of Bhagirathi River reach is proposed to be carried out for different conditions of flow to know the reasons restricting free flow discharge from TRC towards river side and their back pressure effect on machine vibration.

The conclusion of the study will be reviewed and further action will be taken after thorough review of Competent level.

3. *Point-wise status of compliance on the comments of world Bank mentioned at page No. 271 to page No. 275 of DPR is attached as Annexure-7.*
4. *Confirmation from the OEM of Butterfly Valve that the in-situ repair of the same is not possible/feasible under the prevailing circumstances and detailed study report along with the experts' advice will be submitted before Hon'ble Commission prior to taking up this work. "*

Commission's Observations, Views & Directions:-

14. On examination of the Petition and subsequent submissions of the Petitioner following has been observed:-

Maneri Dam

- (1) With regard to 'Construction of the energy dissipation systems in the downstream of Maneri Dam as per the recommendations of model studies', the Commission has observed that the said works are dependent on the findings of the technical hydrological studies namely Glacial Lake Outburst Flow (GLOF) study, flood routing studies, physical model study, free board calculations etc. which calls for a meticulous analysis and interpretation of the findings of the

said studies having a direct impact on the design and construction of the proposed Energy Dissipation Arrangement (EDA). Therefore, execution of the said works should be carried after incorporating the comments/observations of World Bank/CWC/CPMU, findings of various technical studies and followed by efficient monitoring and quality check at each stage of construction at site.

- (2) With regard to 'Construction of protection wall in the vicinity of Model Inter College towards downstream at right bank along the reservoir rim to prevent erosion during floods', the Commission has observed that the said works should be executed using appropriate steel reinforcement structure duly approved by the competent authority.
- (3) With regard to 'Consultancy works related to review of dam design & its appurtenant structures', the Commission has observed that the outcomes of the said consultancy works should be seen in tandem with the findings/observations/suggestions of CPMU/World bank and the outcomes of the model study for EDA while executing works pertaining to EDA and appurtenant structures for ensuring dam safety and stability.
- (4) With regard to 'Construction/Development of Tourist Convenience Centre, Boat Club and Rafting Centre at Maneri dam site' and 'Construction of visitor room near Dam top', the Commission has observed that the said works would help in generating new revenue streams for the Petitioner and would also help in spreading knowledge amongst visitors and tourist with respect to hydro generation. Further, it would help in creating a conducive environment for acceptance of hydro power plants amongst the general public residing in the vicinity of the power plant/dam and create indirect employment to the local people.
- (5) With regard to recommendation of World Bank on prioritizing the works related to safety of Dam viz. 'Replacement/repair of damaged steel liner/plate on piers/glacis of spillway. Repair of damaged piers on upstream side using high performance concrete', 'Reaming & re-drilling of drainage holes inside foundation gallery' and 'Repair of damaged flushing conduit tunnel & sedimentation chamber' the Commission has observed that the said works are

important for dam safety and accordingly the Petitioner should make its all efforts for prioritizing the said works under Part-A (works for which the funds have already been allocated to the Petitioner under DRIP-II Scheme) or through its internal resources.

- (6) With regard to 'Renovation/construction of type-II/III/IV building including the development of basic facility as per the bare minimum requirement of O&M staff' the Commission has observed that the said works were earlier covered under RMU of MB-I project and not concurred by the Commission in its Order dated 30.07.2015 at that point of time. However, considering the Petitioner's submission that the residences of MB-I project colony at Maneri, Tiloth & Kuteti Devi are damaged and have outlived their life (approx. 40 years old) having non-framed structures, the need for renovation/construction of type-II/III/IV building with adequate steel reinforcement for providing strength and stability to the structures in a seismic prone region is the need of the hour.
- (7) With regard to the Cost Benefit Analysis, the Commission has observed that the Petitioner has claimed a benefit to cost ratio of 1.04 with Internal Rate of Return (IRR) as 10.3% from the proposed capital investment of Rs 87.38 Crores. The Commission opines that no direct relation can be drawn with respect to enhancement in energy generation post execution of the proposed works. However, the Commission foresees the proposed investment as a life extension opportunity for its Civil and Hydro-mechanical infrastructures installed at its Dams/Barrages which is of paramount importance from safety point of view.

Joshiyara Barrage

- (1) With regard to 'Reconstruction of Energy Dissipation Arrangements', the observations of the Commission are same as detailed at point no. 14 (1) under Maneri Dam.
- (2) With regard to 'Construction of cut-off drain/Seepage drains at right bank of Joshiyara Barrage reservoir area of MB-II project (Uttarkashi) towards to prevent seepage/leakage of water from reservoir through right bank of barrage', from the submission of the Petitioner the Commission has observed that whenever the reservoir level is higher than El 1105 M the water percolates through RBM zone

below the river bed and emerges out at low lying area of Gyansu Basti and the existing cut-off drain constructed along the toe of the embankment is not arresting the entire seepage coming below the embankment.

In order to arrest the seepage issue the Petitioner is proposing construction of cut-off drain upto required depth along with curtain grouting upto 10 M below the river bed along the right bank of Joshiyara barrage to counter the water thrust during high flood. The Commission opines that the proposed works would not only help in redressal of the seepage problem for the residents residing in low lying areas of Gyansu village but would also help in raising the reservoir level upto Full Reservoir Level (FRL) resulting in increased generation potential for MB-II HEP.

- (3) With regard to 'Removal of accumulated RBM at downstream of barrage' and 'Reaming & re-drilling of drainage holes inside foundation gallery of Joshiyara barrage' the Commission has observed that the said works have been identified by the World Bank as important for barrage safety concerns and accordingly the Petitioner should make its all efforts for prioritizing the said works under Part-A (works for which the funds have already been allocated to the Petitioner under DRIP-II Scheme) or through its internal resources as the same has a direct impact on the barrage safety.
- (4) With regard to 'Construction/provision of additional back regulator TRC gates at Dharasu Power House site' the Commission has observed that the Petitioner has done modification in Tail Race Channel for mitigating the vibrations in the machines as per CFD analysis under Balance Capital works of MB-II HEP. The Commission opines that the said work of additional back regulator TRC gates should be conducted after due diligence study/analysis as the execution of the same in absence of expert advice/study would not only hinder the power generation but also would not be a prudent investment for resolving the problems of vibrations in machines.
- (5) With regard to 'Expansion/modification in cavern of Valve House Chamber of MB-II project at Dharasu' the Commission has observed that the said modification work is proposed in the valve house chamber and therefore execution of the said

works calls for a lot of precision. Further, the Commission opines that the Petitioner should confirm regarding feasibility of in-situ repair of the Butterfly valve from the OEM prior to start of the said works and submit a report before the Commission in this regard.

- (6) With regard to 'Third party quality control & supervision work through reputed Agency like NCCBM, CSMRs etc for re-construction of EDA work' and 'Consultancy works related to review of Barrage design & its appurtenant structures, hydrographic survey, Capacity survey, submergence area etc' the Commission has observed that the said works are an integral part of the works pertaining to Energy Dissipation Arrangement and therefore should be covered under Part-A of DRIP-II Scheme.
 - (7) With regard to 'Construction/Development of Tourist Convenience Centre, Boat Club and Rafting Centre at U/S of Joshiyara Barrage site', observations of the Commission are same as detailed at point no. 14 (4) under Maneri Dam.
 - (8) With regard to the Cost Benefit Analysis, the Commission has observed that the Petitioner has claimed a benefit to cost ratio of 1.18 with Internal Rate of Return (IRR) as 12.2% from the proposed capital investment of Rs 115.52 Crores. The opinion of the Commission is same as detailed at point no. 14 (7) under Maneri Dam.
15. Based on the above discussion, the Commission grants in-principle approval for the works proposed and as discussed above for **Maneri Dam and Joshiyara Barrage** excluding the works proposed for:- i) 'Construction/provision of additional back regulator TRC gates at Dharasu Power House site', ii) 'Expansion/modification in cavern of Valve House Chamber of MB-II project at Dharasu' .

The works excluded above should be carried out after conducting due diligence study and subsequent approval from the Commission.

16. The above in-principle approval is being granted subject to the following: -
- (1) The Petitioner is directed to obtain the prices through competitive bidding for the works allowed by the Commission under the prevailing rules & regulations

and prudence of the prices will be scrutinized at the time of fixation of tariff after completion of the said works.

- (2) The Petitioner to make its all efforts for conversion of loan amount to grant from the Govt. of Uttarakhand.
- (3) All the loan conditions as may be laid down by the funding agency (if any) in their detailed sanction letter are strictly complied with. However, the Petitioner is directed to explore the possibility of swapping the loan with cheaper debt option available in the market.
- (4) 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 agreed by the State Government or any other source in respect of the proposed R&M works.
- (5) After completion of the aforesaid works, the Petitioner shall submit the completed cost and financing of the project.
- (6) The cost of servicing the project cost shall be allowed in the Annual Revenue Requirement of the Petitioner after the assets are capitalized and subject to prudence check of cost incurred.

A separate Order shall be issued for the DRIP-II Scheme works pertaining to Ichari Dam, Asan Barrage, Dakpathar Barrage and Virbhadra Barrage of UJVN Ltd.

Ordered accordingly.

(M.K. Jain)
Member (Technical)

(D.P. Gairola)
Member (Law)