Before

UTTARAKHAND ELECTRICITY REGULATORY COMMISSION

Petition No. 24 to 27 of 2015

In the Matter of:

Approval of Capital Investments under Para 11 of the Transmission and Bulk Supply Licence for:

1. Increasing capacity of 220 kV S/s Virbhadra Rishikesh from 2x160 MVA (220/132 kV) to 3x160 MVA (220/132kV).
2. Augmentation of 220 kV s/s Jhajhra from 2x40 MVA to 2x80 MVA.
3. Augmentation of Transformer capacity of 132 kV S/s Bhupatwala Haridwar from 2x40 MVA to 3x40 MVA and construction of 03 nos. 33kV bays at 132 kV S/s Bhupatwala Haridwar.
4. System strengthening of 132 kV S/s Kichha.

In the Matter of:

Power Transmission Corporation of Uttarakhand Limited (PTCUL) …**Petitioner**

Coram

Shri Subhash Kumar Chairman

Shri K.P. Singh Member

Date of Order: February 11, 2016

ORDER

This Order relates to the Petitions filed by Power Transmission Corporation of Uttarakhand Ltd. (hereinafter referred to as "PTCUL" or "the Petitioner") seeking investment approval of the Commission for the following works:

(1) Increasing capacity of 220 kV S/s Virbhadra Rishikesh from 2 x 160 MVA (220/132 kV) to 3 x 160 MVA (220/132 kV).

(2) Augmentation of 220 kV s/s Jhajhra from 2 x 40 MVA to 2 x 80 MVA.

(3) Augmentation of Transformer capacity of 132 kV S/s Bhupatwala Haridwar from 2 x 40 MVA to 3 x 40 MVA by procurement, erection & commissioning of 01 No. 132/33

kV 40 MVA Transformer and construction of 03 nos. 33kV bays at 132 kV S/s Bhupatwala Haridwar.

(4) System strengthening of 132 kV S/s Kichha Comprising of:

(a) Augmentation of 132/33 kV transformer capacity at 132 kV S/s Kichha from 2 x 40 MVA to 3 x 40 MVA including construction of associated 01 no. 132 kV bay and 01 no. 33 kV bay and bisection of 33 kV main bus.

(b) Construction of 01 no. Bus Coupler bay using hybrid switchgear and bisection of existing 132 kV main bus.

(c) Proposal for ampacity increment of 132 kV Pantnagar-Rudrapur circuit (7.6 Kms.) by replacing the existing ACSR Panther conductor with high capacity ACCC Casablanca conductor i.e. HTLS (High Temperature Low Sag) Conductor.

Background

2. The Petitioner submitted its Petitions vide letters No. 1448, 1446, 1449 & 1447 dated 16.09.2015 for approval of Capital investment under Regulations of UERC (Conduct of Business) Regulations, 2014 and Para 11 of Transmission and Bulk Supply Licence [Licence No. 1 of 2003].

3. The investment proposals of the Petitioner comprises of augmentation of existing Sub-stations, replacement of conductor and associated work of the sub-stations and line.

4. The estimated cost of the works proposed by the Petitioner through the DPRs submitted alongwith the Petitions is as follows:

Sl. No.	Particulars	Transformer Capacity MVA/length of line	Project Cost as per DPR		Project cost considered by REC for funding the debt (Rs. Crore)
			Excluding IDC (Rs. Crore)	Including IDC (Rs. Crore)	
1	Increasing capacity of 220 kV S/s **Virbhadra, Rishikesh** alongwith 220 kV & 132 kV bays.	2x160 MVA (220/132 kV) to 3x160 MVA (220/132 kV)	17.51	18.19	18.18
2	Augmentation of 220 kV S/s **Jhajhra**, Dehradun	2x40 MVA to 2x80 MVA	24.36	24.88	24.88
3	Procurement, erection & commissioning of 01 No. 132/33 kV 40 MVA transformer for increasing capacity of 132 kV S/s **Bhupatwala Haridwar** & construction of 03 Nos. bay at 132 kV S/s Bhupatwala, Haridwar	2x40 MVA to 3x40 MVA	9.37	9.54	9.37

Sl. No.	Particulars	Transformer Capacity MVA/length of line	Project Cost as per DPR		Project cost considered by REC for funding the debt (Rs. Crore)
			Excluding IDC (Rs. Crore)	Including IDC (Rs. Crore)	
4	System strengthening of 132 kV S/s **Kichha**, comprising of:				
a)	Augmentation of 132/33 kV Transformer capacity at 132 kV S/s Kichha, including construction of associated 01 No. 132 kV bay and 01 No. 33 kV bay and dissection of 33 kV main bus	2x40 MVA to 3x40 MVA	11.52	12.11	11.52
b)	Construction of 01 No. bus coupler bay using hybrid switchgear and bisection of existing 132 kV main line bus	-			
c)	Ampacity increment of 132 kV Pantnagar-Rudrapur Circuit by replacing existing ACSR Panther conductor with high capacity ACCC Casablanca conductor	7.6 Kms.			
	Total		**62.76**	**64.72**	**63.95**

5. The Petitioner has submitted copy of extracts of the Minutes of Board Meetings of PTCUL wherein the Petitioner's Board has approved the Corporation's aforesaid proposals with a funding plan of 70% through loan assistance by financial institutions and balance 30% as equity proposed would be funded by GoU. However, the Petitioner did not submit any letter from the Government or any such documentary evidence entailing Government's commitment towards equity funding for the above proposal.

6. On examination of the Petitions, the Commission observed following deficiencies which were communicated to the Petitioner vide letter No. 1575 dated 18.01.2016:

"

1. Augmentation of 220 kV S/s Jhajhra from 2 X 40 MVA to 2 X 80 MVA.

a. PTCUL in its petition has submitted that the future load on the 220 kV Jhajhra S/s would be 178 MVA, whereas, PTCUL in its petition has requested for augmentation of its 220 kV Jhajhra S/s from 2 X 40 MVA to 2 X 80 MVA only, the Commission has observed that the 2 X 80 MVA transformers would be loaded upto approx. 110% of its rated capacity.
PTCUL is required to clarify the same alongwith details of no. of years of future load growth considered by it in its petition.

2. System Strengthening of 132 kV S/s Kichha.

a. PTCUL has not provided details/approval letter of funding agency for the investment approval pertaining to 132 kV Kichha S/s. PTCUL is required to submit the same."

7. To justify the need of the works proposed in the above Petitions, the Petitioner has submitted that:

(1) **Increasing capacity of 220 kV S/s Virbhadra Rishikesh from 2 x 160 MVA (220/132 kV) to 3 x 160 MVA (220/132kV) alongwith its 220 kV & 132 kV bays.**

(a) Virbhadra Rishikesh is an important Grid substation which is being used for evacuation of hydro power from MB-I & MB-II as well as Chilla Hydro Power Plant of UJVN Ltd. and other private generators. Besides above, it is also feeding to the important areas of Dehradun, Haridwar, Rishikesh and entire Garhwal hills.

(b) Virbhadra Rishikesh is having 2x160 MVA (220/132 kV) transformers and presently the loading of both the installed transformers is approximately 90% of total capacity and the load on this Substation is increasing day by day. The load on 132 kV side is adjusted by UPCL by unscheduled rostering of non-continuous industrial feeders connected down the line. As the existing transformers are overloaded therefore, leaves no cushions for routine/preventive maintenance which necessitates the requirement of one extra transformer in the substation in order to avoid any power supply interruption.

(c) The contingency condition viz. tripping/breakdown of 220 kV Rishikesh-SIDCUL line, 220 kV Jhajhra line or shutting down/low power generation of Chilla Power House results in shifting of extra load on installed 2 x 160 MVA transformers. Therefore, installation of the additional 160 MVA transformer alongwith its 220 kV & 132 kV bays is necessary to meet out the present and future load growth and also helpful to avoid the rostering at the time of maintenance and stability of Grid.

(2) **Augmentation of 220 kV s/s Jhajhra from 2 x 40 MVA to 2 x 80 MVA.**

(a) 220 kV Jhajhra substation is an important substation of PTCUL under Garhwal Zone which was commissioned in year 2013-14, presently it is catering to the power demands of Dehradun. There are 02 nos. 40 MVA, 132/33 kV Transformers installed at Jhajhra substation for meeting the load requirement of domestic, commercial, industrial as well as agricultural consumers of Ganeshpur, Selaqui, Kaulagarh, Pharmacity, Premnagar and Vasant Vihar areas.

(b) PTCUL in its submission has submitted that in the month of May 2015 the total load on 2 x 40 MVA transformers was 376 Amp on 132 kV side of the transformers (i.e. approx. 86 MVA load) consequently, the max winding temperature of the transformers was observed upto 85 degree centigrade. Further, PTCUL has submitted that the following feeders are connected from 2 x 40 MVA, 132/33 kV transformers at Jhajhra:

Sl. No.	Name of Feeder	Connected Load (MVA)
1.	33 kV Ganeshpur	10
2.	33 kV Selaqui-2	20
3.	33 kV Kaulagarh	28
4.	33 kV Pharmacity	20
5.	33 kV Premnagar	16
6.	33 kV Selaqui-1	34
	Total Connected load	**128**

(c) In response to the Commission's observations dated 18.01.2016 pertaining to 220 kV S/s Jhajhra, mentioned at para 6 above, the Petitioner vide its letter No. 161 dated 25.01.2016 submitted its reply clarifying that presently connected load at 220 kV S/s Jhajhra is 128 MVA and apart from this approx. 50 MVA load, 20 MVA each at Vasant Vihar & AWHO, and 5 MVA each at Pharmacity & Premnagar is expected to be added in future. Further, PTCUL has submitted that approx. 40 MVA load out of this 178 MVA future load would be connected to the PTCUL's Substation at Dhakrani Power House as the same is having a capacity of 2 X 40 MVA, therefore, effectively total 138 MVA load shall be catered by 220 kV Jhajhra S/s. Moreover, PTCUL has submitted that the load growth considered by it is for next 3 to 5 years. Beside above, PTCUL has submitted that considering the rapid load growth in the area it is planning to propose an additional GIS (220/33 kV) S/s of 2 X 50 MVA capacity at Selaqui Industrial area, Dehradun. Thus, considering the existing loading of the 2 x 40 MVA transformers and future load growth PTCUL has proposed for augmentation of existing 2 x 40 MVA transformers to 2 x 80 MVA at 33 kV level at Jhajhra S/s.

(3) **Augmentation of Transformer capacity of 132 kV S/s Bhupatwala Haridwar from 2 x 40 MVA to 3 x 40 MVA and construction of 03 nos. 33 kV bays at 132 kV S/s Bhupatwala Haridwar.**

(a) PTCUL has submitted that at present the substation meets the load requirement of domestic, commercial, as well as agricultural consumers of Bhupatwala, Laljiwala, Bairagi Camp, Shyampur & Chilla. The existing load connected to this S/s is as follows:

Sl. No	Name of Feeder	Connected Load (MVA)
1.	33 kV Bhupatwala	20
2.	33 kV Laljiwala-2	20
3.	33 kV Bairagi Camp	33
4.	33 kV Shyampur	10
5.	33 kV Chilla	4.5
6.	33 kV Shantikunj	10
7.	33 kV Ring Mains	36
	Total Connected load	**133.5**

(b) The scope of works submitted by PTCUL covers:

(i) Supply, erection & commissioning of 1 no. 40 MVA 132/33 kV transformer

(ii) Construction of 1 no. 132 & 33 kV bay for 40 MVA transformer

(iii) Construction of additional 3 nos. 33 kV bays for consumer feeders.

(c) PTCUL has submitted that it is necessary to carry out the aforesaid works at 132 kV Bhupatwala substation in order to cater to the demand on account of the Ardhkumbh/Kumbh Mela and to provide reliable power supply to the existing consumers.

(d) In response to the Commission's letter No. 1643 dated 02.02.2016 regarding source of funding of IDC for the works proposed for 132 kV S/s Bhupatwala, PTCUL vide its letter No. 86 dated 05.02.2016 has submitted that the source of funding of IDC for works proposed for 132 kV S/s Bhupatwala would be from REC as informed by REC vide its email dated 05.02.2016.

(e) On examination of the submissions of PTCUL, the Commission observed that the existing 2x40 MVA, 132/33 kV transformers at 132 kV Bhupatwala substation are loaded approximately 90% of their rated capacity and foreseeing the load growth of 35 to 40 MVA on account of upcoming Ardhkumbh 2016 necessitates an immediate requirement of augmentation in transformation capacity at 33 kV level from 2x40 MVA to 3x40 MVA. As the

Ardhkumbh 2016 has already started, PTCUL can utilize the 40 MVA (132/33 kV) Transformer being spared by installation of 80 MVA Transformer at Jhajhra S/s.

(4) **System strengthening of 132 kV S/s Kichha.**

(a) PTCUL has submitted that 132/33 kV substation, Kichha is one of the oldest substation of PTCUL in Kumaon Zone which caters the power needs of Tarai region. Presently, there are 02 nos. 40 MVA, 132/33 kV transformers installed at the substation. The substation meets the load requirements of domestic, commercial, industrial as well as agricultural consumers of the region. The preset running load of the substation is approximately 90-95% of the total transformer capacity and keeping in view the exponential load growth in the region in future as well as in order to meet T-1 contingency condition for the transformers PTCUL has proposed following works for the overall strengthening of the substation:

(i) Augmentation of 132/33 kV transformer capacity at 132 kV S/s Kichha from 2x40 MVA to 3x40 MVA including construction of associated 01 no. 132 kV bay and 01 no. 33 kV bay and bisection of 33 kV main bus.

(ii) Construction of 01 no. Bus Coupler bay using hybrid switchgear and bisection of existing 132 kV main bus.

(iii) Ampacity increment of 132 kV Pantnagar-Rudrapur circuit (7.6 Kms.) by replacing for existing ACSR Panther conductor with high capacity ACCC Casablanca conductor i.e. HTLS (High Temperature Low Sag) Conductor.

(b) With regard to new 40 MVA transformer to be installed at 132 /33 kV Kichha substation, PTCUL has submitted that it would mobilize its one of the transformer installed at 220/33 kV Jhajhra substation which has been planned to be augmented from 40 to 80 MVA, which would be utilized in 132/33 kV Kichha substation for augmenting from 2x40 MVA to 3x40 MVA. Further PTCUL has submitted that the proposed 40 MVA additional transformer would also be helpful in meeting the T-1 contingency condition for transformers.

(c) With regard to replacement of existing ACSR Panther conductor with ACCC Casablanca conductor in 132 kV Pantnagar-Rudrapur circuit, PTCUL has submitted that the load of new 40 MVA transformer at 132 kV Kichha substation would be catered through Kichha-Rudrapur line and therefore, the impact of additional 40 MVA load would be reflected on ACSR Panther conductor in 132 kV Pantnagar-Rudrapur section, which is in general design to operate for maximum 100 MVA loading. Therefore, in order to avoid overloading of 132 kV Pantnagar-Rudrapur section PTCUL has proposed to replace existing ACSR Panther conductor with ACCC Casablanca conductor.

(d) With regard to bisection of 132 kV existing main bus at 132 kV Kichha substation PTCUL has proposed for construction of 01 no. bus coupler bay using hybrid switchgear due to space constraints in the switchyard. Moreover, PTCUL has proposed bisection of 33 kV main bus in order to have a greater flexibility in load management in the event of failure of any of the transformers.

(e) In response to the Commission's observations sent to PTCUL vide letter dated 18.01.2016 pertaining to 132 kV S/s Kichha, mentioned at para 6 above, the Petitioner vide its letter No. 161 dated 25.01.2016 submitted sanction letter for funding from REC for 132 kV S/s Kichha, in which the Commission observed that source of funding for IDC for the proposed works for 132 kV S/s Kichha has not been included.

(f) The Commission vide its letter No. 1643 dated 02.02.2016 enquired regarding source of funding of IDC for the works proposed for 132 kV S/s Kichha. In response, PTCUL vide its letter No. 86 dated 05.02.2016 has submitted that the source of funding of IDC for works proposed for 132 kV S/s Kichha would be from REC as informed by REC vide its email dated 05.02.2016.

Commission's observations, views and decision

8. On examining the Petitions and subsequent submissions/clarifications, project-wise observations are as follows:

(1) **Increasing capacity of 220 kV S/s Virbhadra Rishikesh from 2 x 160 MVA (220/132 kV) to 3 x 160 MVA (220/132kV) alongwith its 220 kV & 132 kV bays.**

(a) With regard to increasing capacity of 220 kV S/s Virbhadra Rishikesh from 2x160 MVA (220/132 kV) to 3x160 MVA (132/33 kV), it has been observed that since the existing load on 2x160 MVA, 220 kV transformers is approximately 90% of total capacity of the transformers, hence an immediate necessity of increasing the transformation capacity at 220 kV level at Virbhadra, Rishikesh substation is required for catering the existing as well as future load growth in the area. Moreover, the load flow study submitted by the Petitioner also substantiates the necessity of augmentation the capacity of 220 kV S/s.

(b) In addition to the above, the proposed installation of new 160 MVA at 220 kV S/s, Virbhadra, Rishikesh would also help in complying the T-1 contingency condition in the event of outage/maintenance of any one of the installed 160 MVA transformer.

(c) Further, with regard to maximum transformation capacity at various voltage levels para 15.4 of the CEA Manual on Transmission Planning Criteria, 2013 stipulates that:

> *"15.4 Effort should be to explore possibility of planning a new substation instead of adding transformer capacity at an existing substation when the capacity of the existing sub-station has reached as given in column (B) in the following table. The capacity of any single sub-station at different voltage levels shall not normally exceed as given in column (C) in the following table:*

Voltage Level(A)	***Transformer Capacity***	
	Existing Capacity (B)	***Maximum Capacity(C)***
765 kV	*6000 MVA*	*9000 MVA*
400 kV	*1260 MVA*	*2000 MVA*
220 kV	*320 MVA*	*500 MVA*
132 kV	*150 MVA*	*250 MVA*

"

On examining the proposal w.r.t. the above Criteria, the Commission observed that with the installation of 160 MVA transformer at Virbhadra, Rishikesh the total transformation capacity at 220 kV level would be 480 MVA which is almost equal to the maximum transformation capacity at 220

kV level as per above mentioned CEA norm. Therefore, for catering any additional future load growth in the area, PTCUL should plan accordingly.

Based on the discussions made above, the proposal of PTCUL for augmentation of the existing transformation capacity of 220 kV S/s Virbhadra, Rishikesh from 2 x 160 MVA to 3 x 160 MVA alongwith construction of 220 kV & 132 kV bay is justified.

(2) **Augmentation of 220 kV S/s Jhajhra from 2 x 40 MVA (132/33 kV) to 2 x 80 MVA (132/33 kV).**

(a) On examination of the submissions of PTCUL, the Commission has observed that the existing 2x40 MVA, 132/33 kV transformers at 220 kV Jhajhra substation were approximately 107% loaded in the month of May 2015, thus, raises an urgency of augmentation in transformation capacity at 33 kV level from 2x40 MVA to 2x80 MVA. It has also been observed that the Petitioner has submitted that the proposed augmentation would be sufficient to cater the load growth upto next 5 years.

(b) Based on the submissions made by the Petitioner, the Commission is of the view that the augmentation of 220 kV S/s Jhajhra from 2x40 MVA to 2x80 MVA is justified.

(3) **Augmentation of Transformer capacity from 2x40 MVA (132/33 kV) to 3x40 MVA (132/33 kV) and construction of 03 nos. 33 kV bays at 132 kV S/s Bhupatwala, Haridwar.**

(a) On examining the submissions of the Petitioner, it has been observed that 132 kV Bhupatwala substation is an important S/s in Kumbh Mela region of Holy Town Haridwar. During the 'Parvas', the installed 2 x 40 MVA, 132/33 kV transformers generally get loaded upto 90% of the rated capacity. Further, it has also been submitted that during the Ardh Kumbh and Kumbh Melas, additional load of 35 to 40 MVA is expected to be catered through this substation, therefore, foreseeing the future load of 35 to 40 MVA on account of upcoming 'Melas' necessitates the augmentation in transformation capacity at 33 kV level from 2x40 MVA to 3x40 MVA at 132 kV S/s Bhupatwala, Haridwar.

(b) From the submission of the Petitioner it has been observed that PTCUL has planned the augmentation of 132 kV Bhupatwala substation with a short term planning as the proposal submitted before the Commission is devoid of long term planning criteria i.e. for N-1 & T-1 contingencies as per CEA manual on Transmission Planning.

(c) However, considering the situation of 90% loading on the existing transformers, the Commission feels that augmentation of 132 kV S/s Bhupatwala, Haridwar from 2x40 MVA to 3x40 MVA and construction of 03 nos. 33 kV bays is needed. Further, PTCUL, being the sole transmission licensee of the State, is advised to go for a long-term planning foreseeing the load growth in the area and giving due consideration to N-1 & T-1 contingency criteria.

(d) From the submission of PTCUL dated 05.02.2016, the Commission has observed that although PTCUL had not given details of IDC funding earlier, however, from its submission dated 05.02.2016 it can be considered that IDC component would also be funded by REC. Therefore, the Commission has considered the total Project Cost considered by REC for funding of the project including IDC as **Rs. 9.54 Crore** in anticipation that REC would allow IDC funding also. However, PTCUL can utilize the 40 MVA (132/33 kV) Transformer being spared at Jhajhra S/s.

(4) **System strengthening of 132 kV S/s Kichha.**

(a) On examination of the submissions of PTCUL the Commission has observed that the existing 2x40 MVA, 132/33 kV transformers at 132 kV Kichha substation are loaded upto approximately 95% of their total capacity. Moreover, foreseeing the future load growth PTCUL has proposed augmentation in transformation capacity at 33 kV level from 2x40 MVA to 3x40 MVA.

(b) With regard to the bisection of 132 kV main bus at 132 kV Kichha substation with the use of hybrid switchgear, the Commission is of the view that using hybrid switchgear in order to mitigate the problem of space constraint is a novel idea, however, PTCUL should ensure the availability of its spares in

future. Hence, principally the idea of bifurcating the main bus for segregating the load of the substation is agreeable, however, PTCUL has to ensure that all the contingency conditions requiring transfer of load from main bus to transfer bus should be catered through the proposed bus arrangements by PTCUL without any hindrance.

(c) With regard to the bisection of 33 kV main bus in order to have a greater flexibility in load management in the event of failure of any of the transformers the proposal is acceptable to the Commission.

(d) With regard to replacement of existing ACSR Panther conductor with ACCC Casablanca conductor in 132 kV Pantnagar-Rudrapur circuit, the Commission has observed that the rationale submitted by PTCUL in support of replacement of ACSR Panther conductor with ACCC Casablanca conductor appears to be correct as Panther conductor can transfer approximately 90 MVA load whereas, the load experienced by 132 kV Pantnagar-Rudrapur circuit after the coming up of additional 40 MVA transformer at 132 kV Kichha would be approximately 120 MVA after including the load of 80 MVA of 132 kV Rudrapur substation. Therefore, there would be an urgent need to replace the existing ACSR Panther conductor with higher capacity conductor.

(e) From the submission of PTCUL dated 05.02.2016, the Commission has observed that although PTCUL had not given details of IDC funding earlier, however, from its submission dated 05.02.2016 it can be considered that IDC component would also be funded by REC. Therefore, the Commission has considered the total Project Cost considered by REC for funding of the project including IDC as **Rs. 12.11 Crore** in anticipation that REC would allow IDC funding also. However, spared 40 MVA (132/33 kV) Transformer at Jhajhra S/s needs to be utilized at Kichha S/s.

(f) The need of augmentation in transformation capacity at 132 kV S/s Kichha from 2x40 MVA to 3x40 MVA is justified. However, the commission has observed that since no T-1 contingency provisions exists at 132 kV S/s

Kichha, therefore, PTCUL should plan accordingly for specifically for reliability of the system and to cater the future load growth in the region.

9. Further examining the financial aspects of the proposal, it has been observed that while preparing the estimate for the DPRs, the Petitioner in addition to contingency has also included quantity variation and cost escalation both @ 20% (except for Kichha). However, in absence of any justified reasons for including the said quantity variation and cost escalation, the Commission is not considering the same as of now in the Order.

10. Thus, the Commission hereby grants in-principle approval for the investment of **Rs. 49.05 Crore** only against Rs. 64.72 Crore (including IDC) proposed by the Petitioner as per the table given below:

Capital Cost considered by the Commission

Sl. No.	Particulars	Transformer Capacity MVA/ length of line	Project Cost As per DPR		Project Cost considered by REC for funding the debt (Rs. Crore)	Project Cost considered by the Commission (Rs. Crore)
			Excluding IDC (Rs. Crore)	Including IDC (Rs. Crore)		
2	Increasing capacity of 220 kV S/s **Virbhadra, Rishikesh**	2x160 MVA (220/132 kV) to 3x160 MVA (220x132 kV)	17.51	18.19	18.18	12.84
2	Augmentation of 220 kV S/s **Jhajhra, Dehradun**	2x40 MVA to 2x80 MVA	24.36	24.88	24.88	17.43
3	Procurement, erection & commissioning of 01 No. 132/33 kV 40 MVA transformer for increasing capacity of 132 kV S/s **Bhupatwala Haridwar** & construction of 03 Nos. bay at 132 kV S/s Bhupatwala, Haridwar	2x40 MVA to 3x40 MVA	9.37	9.54	9.54	6.67
4	System strengthening of 132 kV S/s **Kichha**, comprising of:					
a)	Augmentation of 132/33 kV Transformer capacity at 132 kV S/s Kichha, including construction of associated 01 No. 132 kV bay and 01 No. 33 kV bay and dissection of 33 kV main bus	2x40 MVA to 3x40 MVA	11.52	12.11	12.11	12.11
b)	Construction of 01 No. bus coupler bay using hybrid switchgear and bisection of existing 132 kV main line bus	-				
c)	Ampacity increment of 132 kV Pantnagar-Rudrapur Circuit by replacing existing ACSR Panther conductor with high capacity ACCC Casablanca conductor	7.6 Kms.				
	Total		**62.76**	**64.72**	**64.71**	**49.05**

11. The Petitioner is directed to go ahead with the aforesaid works subject to the fulfillment of the conditions mentioned below:

(1) The Petitioner shall ensure proper utilization of the Transformers spared from the augmented substations and should not be kept idle; such Transformers should be utilized elsewhere, where such capacity augmentation is required.

(2) All the loan conditions as may be laid down by the funding agency in their detailed sanction letter are strictly complied with. However, the Petitioner is directed to explore the possibility of swapping this loan with cheaper debt option available in the market.

(3) 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 schemes.

(4) After completion of the aforesaid schemes, the Petitioner shall submit the completed cost and financing of the schemes.

(5) 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.

(K.P. Singh)
Member

(Subhash Kumar)
Chairman