

MINUTES OF MEETING

A meeting was held on April 13th, 2023 (Chaitra 30th, 2079) between Grid Operation Department, NEA, hereinafter called the "Grid Owner", and M/S Phedi Khola Hydropower Co. Pvt. Ltd., Kathmandu, Nepal, hereinafter called the "Grid User" regarding amendment for capacity upgradation from 3.52MW to 4.3MW of Memorandum of Understanding (MOU) dated 2018/04/25(2075/01/12) for Phedi Khola(Thulung) Hydropower Project (hereinafter called the Project).

Grid User Representatives:

1. Mr. Prakash Chandra Dalal
Managing Director
Phedi Khola Hydropower Co. Pvt. Ltd.

[Signature]
2079/12/30

Grid Owner Representatives:

1. Mr. Shreeram Raj Pandey
Director, GOD
2. Mr. Lunar Shrestha
Manager, GOD
3. Mr. Ananta Upreti
Asst. Manager, GOD

[Signatures]

AGREED POINTS

The Grid User has signed the Memorandum of Understanding (MOU) on April 25th, 2018 (2075/01/12) to connect the 3.52MW Capacity Phedi Khola (Thulung) Hydropower Project at under construction 220/132/33kV Tumlingtar(Khandbari) Substation of NEA at Bhojpur district. This Project is redesigned for the Capacity Upgradation to 4.3MW and Power Trade Department of NEA has requested with letter dated 2079/09/17 for the amendment of Memorandum of Understanding (MOU) dated 2018/04/25(2075/01/12) of Phedi Khola(Thulung) Hydropower Project. Grid Impact Study for the additional capacity of 0.78 MW is carried out by System Planning Department of NEA which is received on dated 2079/11/26. The following points are agreed by Grid User and Grid Owner.

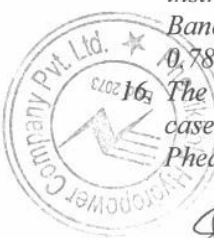
1. The Delivery Point of the Project shall be 220 kV Bus Bar of under construction 220/132/33kV Khandbari(Tumlingtar) Substation of NEA. (Clause no: 1 of Minutes of Meeting of MOU dated 2075/01/12 is replaced by this Clause).
2. The Connection Point of the Project shall be 132 kV Bus Bar at switchyard of Upper Irkhuwa Hydropower Project (14.5MW). (Clause no: 2 of Minutes of Meeting of MOU dated 2075/01/12 is replaced by this Clause).
3. The Grid User shall build approximately 5 km long 33 kV Single Circuit Transmission Line using ACSR "Dog" conductor from Project to Switchyard of Upper Irkhuwa Hydropower Project (14.5MW) where this voltage level is step up at 132kV by utilizing 33/132kV Transformer then a common 18 km long 132kV Single circuit ACSR "Bear" Conductor transmission line and installing 220/132kV Transformer to evacuate total power to under construction 220/132/33kV Khandbari(Tumlingtar) Substation of NEA.
4. EXHIBIT-2(Single Line Diagram), EXHIBIT-3(Connection Point Diagram), EXHIBIT-10(Metering Scheme), Annex-2(Equipment Specifications) of the Memorandum of Understanding dated 2018/04/25(2075/01/12) of Phedi Khola(Thulung) Hydropower Project have been amended as per the attached respective Exhibits and Annexes.
5. Project can be connected in FY 2025/26 provided following condition on clauses: 6,7,8,9,10,11,12,13,14,15,16,17,18 are met for additional capacity of 0.78 MW.
6. Dhalkebar-Muzaffarpur 400kV double circuit line is overloaded in normal case for wet Peak period from FY 2025/26 to FY 2028/29. So the developer of Phedi Khola (Thulung) Hydropower Project (4.3MW) shall agree to abide by the dispatch instructions of NEA's Load Dispatch Center for wet Peak Period normal case from FY 2025/26 to FY 2028/29 for additional capacity of 0.78MW. (Clause as per GAS REPORT).

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7. Dhalkebar-Muzaffarpur 400kV double circuit line is overloaded in normal case for wet off Peak period from FY 2025/26 to FY 2028/29. So the developer of Phedi Khola (Thulung) Hydropower Project (4.3MW) shall agree to abide by the dispatch instructions of NEA's Load Dispatch Center for wet off Peak Period normal case from FY 2025/26 to FY 2028/29 for additional capacity of 0.78MW. **(Clause as per GIS REPORT).**
8. Dhalkebar-Muzaffarpur 400kV double circuit line is overloaded in N-1 contingency case for wet Peak period from FY 2025/26 to FY 2028/29. So the developer of Phedi Khola (Thulung) Hydropower Project (4.3MW) shall agree to abide by the dispatch instructions of NEA's Load Dispatch Center for wet Peak Period N-1 contingency case from FY 2025/26 to FY2028/29 for additional capacity of 0.78MW. **(Clause as per GIS REPORT).**
9. Dhalkebar-Muzaffarpur 400kV double circuit line is overloaded in N-1 contingency case for wet off Peak period from FY 2025/26 to FY 2033/34. So the developer of Phedi Khola (Thulung) Hydropower Project (4.3MW) shall agree to abide by the dispatch instructions of NEA's Load Dispatch Center for wet off Peak Period N-1 contingency case from FY 2025/26 to FY2033/34 for additional capacity of 0.78MW. **(Clause as per GIS REPORT).**
10. GIS is carried out by assuming the Second Cross Border 400kV double circuit (New Butwal-Gorakhpur transmission line) will be completed by the end of FY 2024/25. In case in the absence of Second Cross Border 400kV double circuit (New Butwal-Gorakhpur transmission line), the developer of Phedi Khola (Thulung) Hydropower Project (4.3MW) shall agree to abide by dispatch instruction of NEA's Load Dispatch Center from FY 2025/26 onwards in Dry peak Period, Wet Peak Period and wet off peak period case for additional capacity of 0.78MW. **(Clause as per GIS REPORT).**
11. The New Butwal – Gorakhpur 400kV line is overloaded in N-1 contingency case for wet off Peak Period from FY 2025/26 to FY 2028/29. So, the developer of Phedi Khola (Thulung) Hydropower Project (4.3MW) shall agree to abide by the dispatch instruction of NEA's Load Dispatch Center in wet off peak period N-1 contingency case from FY 2025/26 to FY 2028/29 for additional capacity of 0.78MW. **(Clause as per GIS REPORT).**
12. GIS is carried out by assuming 400kV double circuit (Inaruwa – New Purnea cross Border transmission line) will be completed by the end of FY 2028/29. In case of the absence of 400kV double circuit (Inaruwa – New Purnea cross Border transmission line), the developer of Phedi Khola (Thulung) Hydropower Project (4.3MW) shall agree to abide by dispatch instruction of NEA's Load Dispatch Center from FY 2029/30 onwards in Dry Peak period, Wet Peak Period and wet off peak period case for additional capacity of 0.78MW. **(Clause as per GIS REPORT).**
13. GIS is carried out by assuming 400kV double circuit (Dododhara – New Baraielly cross Border transmission line) will be completed by the end of FY 2028/29. In case of the absence of 400kV double circuit (Dododhara – New Baraielly cross Border transmission line), the developer of Phedi Khola (Thulung) Hydropower Project (4.3MW) shall agree to abide by dispatch instruction of NEA's Load Dispatch Center from FY 2029/30 onwards in Dry Peak period, Wet Peak Period and wet off peak period case for additional capacity of 0.78MW. **(Clause as per GIS REPORT).**
14. GIS is carried out by assuming 400kV double circuit (Dhalkebar – Sitamarhi cross Border transmission line) will be completed by FY 2028/29. In case of the absence of 400kV double circuit (Dhalkebar – Sitamarhi cross Border transmission line), the developer of Phedi Khola (Thulung) Hydropower Project (4.3MW) shall agree to abide by dispatch instruction of NEA's Load Dispatch Center from FY 2029/30 onwards in Dry Peak period, Wet Peak Period and wet off peak period case for additional capacity of 0.78MW. **(Clause as per GIS REPORT).**
15. The Khandbari (Tumlingtar)-Baneswor-Basantapur 220kV transmission line is overloaded in N-1 contingency case for wet Peak Period and wet off peak period from FY 2026/27 onwards. So, the developer of Phedi Khola (Thulung) Hydropower Project (4.3MW) shall agree to abide by dispatch instruction of NEA's Load Dispatch Center for N-1 contingency case of Khandbari (Tumlingtar)-Baneswor-Basantapur 220 kV transmission line from FY 2026/27 onwards for additional capacity of 0.78MW. **(Clause as per GIS REPORT).**
16. The Basantapur – New Duhabi (Inaruwa) 220kV transmission line is overloaded in N-1 contingency case for wet Peak Period and wet off peak period from FY 2026/27 onwards. So, the developer of Phedi Khola (Thulung) Hydropower Project (4.3MW) shall agree to abide by dispatch instruction of



NEA's Load Dispatch Center for N-1 contingency case of Basantapur-New Duhabi (Inaruwa) 220 kV transmission line from FY 2026/27 onwards for additional capacity of 0.78MW. (Clause as per GIS REPORT).

17. Phedi Khola (Thulung) Hydropower Project (4.3MW) will install 220/132kV transformer at NEA's under construction 220/132/33kV Tumlingtar (Khandbari) Substation. If incase, NEA has installed 220/132kV transformer at NEA's under construction 220/132/33kV Tumlingtar (Khandbari) Substation and there is sufficient capacity available for the power evacuation, then the developer shall use the transformer of NEA for inter connection provided the developer agrees to bear capitalization costs of transformer, associated switchgear and losses thereby. A policy for evaluating the costs when approved by NEA shall be accepted and agreed to. (Clause as per GIS REPORT).
18. The following transmission Projects are deemed critical and must be completed before commissioning of Phedi Khola (Thulung) Hydropower Project (4.3MW) for evacuation of power from the project. i.e. F.Y. 2025/26.
- The 220kV Double Circuit transmission line connecting Tumlingtar(khandbari) – Baneshwor-Basantapur – Inaruwa(New Duhabi) and associated substation .
 - 132kV single circuit transmission line from Upper Irkhuwa HPP (14.5MW) upto Tumlingtar(Khandbari)substation.
19. The Metering and Line Loss Sharing of Phedi Khola (Thulung) Hydropower Project (4.3MW) and Upper Irkhuwa Hydropower Project (14.5MW) shall be as shown in Exhibit-10 (Metering Scheme).
20. The Minutes of Meeting signed on dated 2018/04/25(2075/01/12) during the signing of MOU shall be applicable as far as it is not amended by this Minute of Meeting.
21. Both parties agreed on above clauses and the NEA GRID CODE 2005(amended) governs this minute of meeting.



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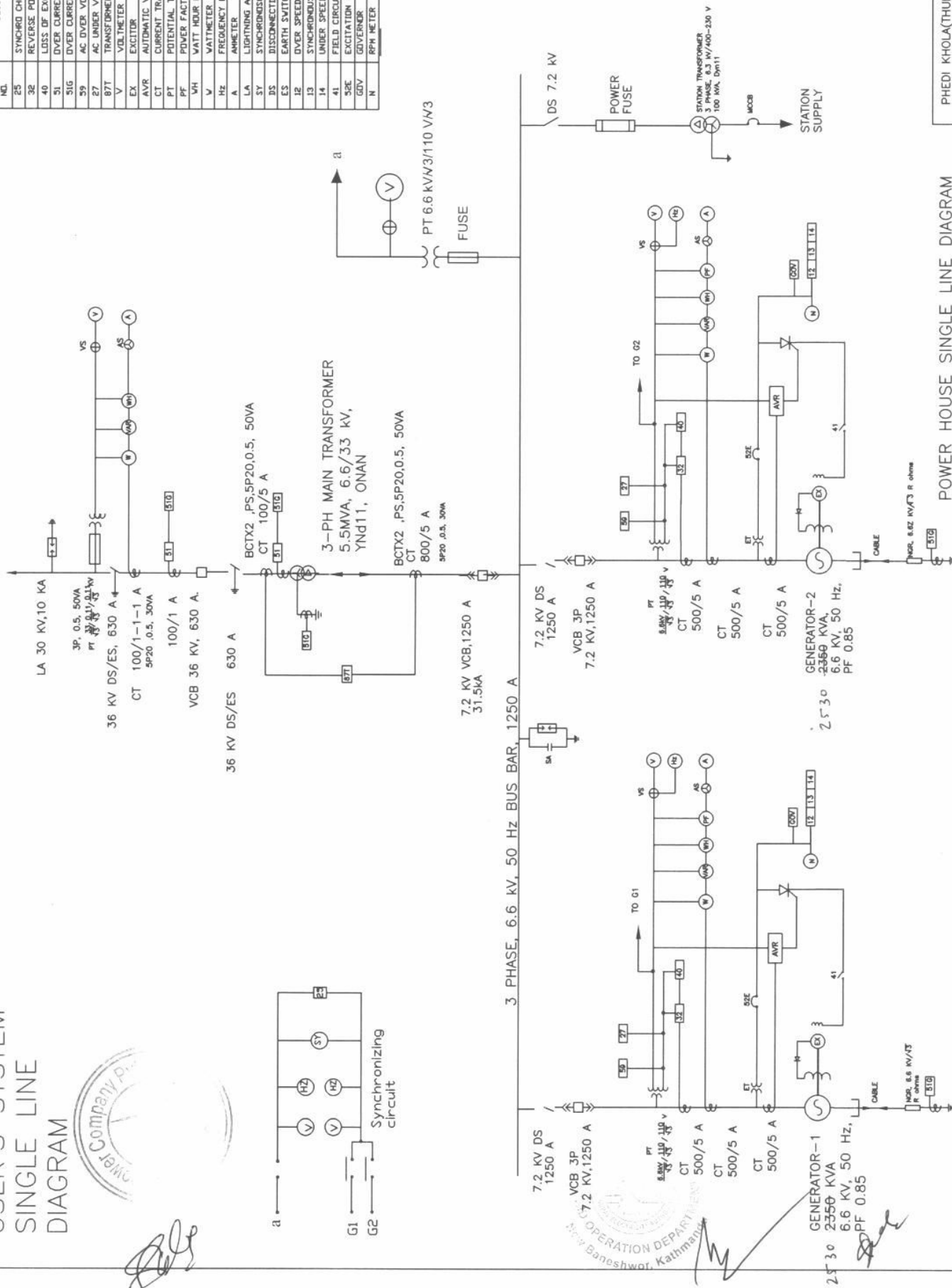
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GENERATION DEPT.
Baneshwor, Kathmandu

To 33 kV DOG TRANSMISSION LINE TO UPPER IRKWA HPP SWITCHYARD

LEGENDS :

DEVICE NO.	DESCRIPTIONS
25	SYNCHRO CHECK RELAY
32	REVERSE POWER RELAY
40	LOSS OF EXCITATION RELAY
51	OVER CURRENT RELAY
51G	OVER CURRENT GROUND RELAY
59	AC OVER VOLTAGE RELAY
27	AC UNDER VOLTAGE RELAY
87T	TRANSFORMER DIFFERENTIAL RELAY
V	VOLTMETER
EX	EXCITOR
AVR	AUTOMATIC VOLTAGE REGULATOR
CT	CURRENT TRANSFORMER
PT	POTENTIAL TRANSFORMER
PF	POWER FACTOR METER
VH	VOLT HOUR METER
V	WATTMETER
H2	FREQUENCY METER
A	AMMETER
LA	LIGHTNING ARRESTOR
SY	SYNCHROSCOPE
DS	DISCONNECTING SWITCH
ES	EARTH SWITCH
12	OVER SPEED RELAY
13	SYNCHROBUS SPEED RELAY
14	UNDER SPEED RELAY
41	FIELD CIRCUIT BREAKER
5SE	EXCITATION CIRCUIT BREAKER
GOV	GOVERNOR
N	RPH METER



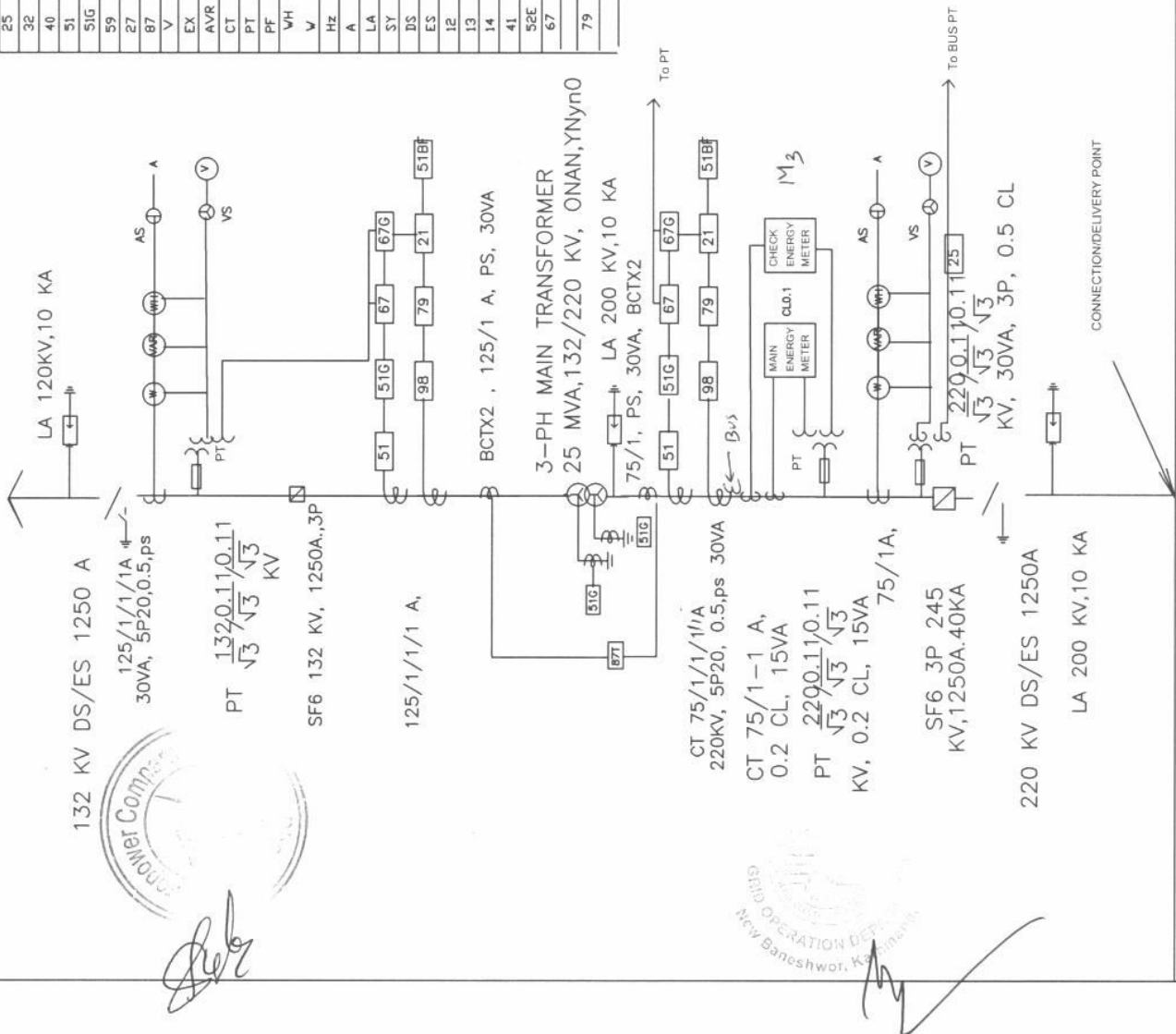
POWER HOUSE SINGLE LINE DIAGRAM

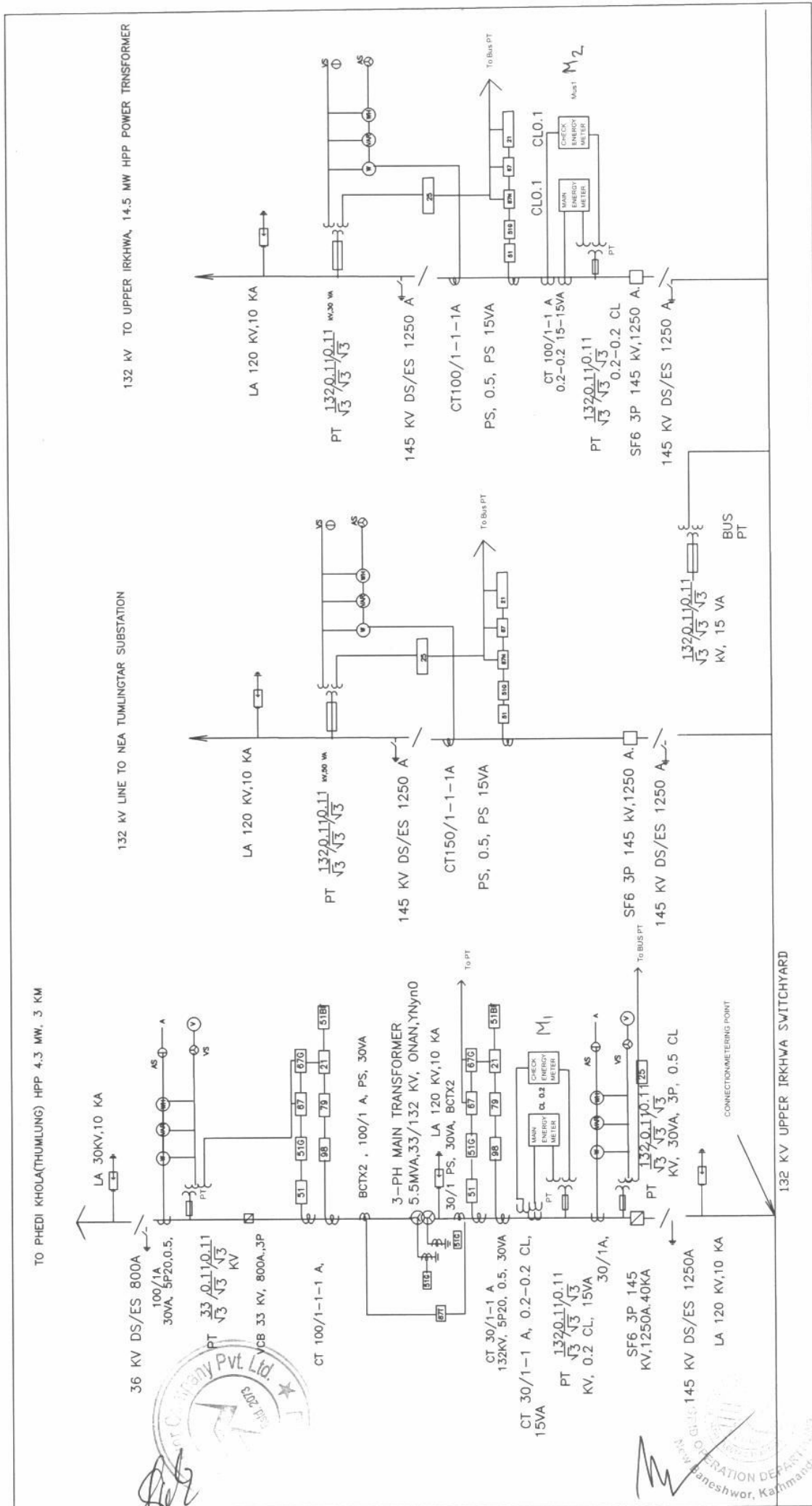
PHEDI KHOLA(THUMLUNG) HPP SWITCHYARD

Incoming 132 kV line from Upper Irkha khola HPP

LEGENDS

DEVICE NO.	DESCRIPTIONS
25	SYNCHRO CHECK RELAY
32	REVERSE POWER RELAY
40	LOSS OF EXCITATION RELAY
51	OVER CURRENT RELAY
51G	OVER CURRENT GROUND RELAY
59	AC OVER VOLTAGE RELAY
27	AC UNDER VOLTAGE RELAY
87	DIFFERENTIAL CURRENT RELAY
V	VOLTMETER
EX	EXCITOR
AVR	AUTOMATIC VOLTAGE REGULATOR
CT	CURRENT TRANSFORMER
PT	POTENTIAL TRANSFORMER
PF	POWER FACTOR METER
VH	WATT HOUR METER
V	WATTMETER
HZ	FREQUENCY METER
A	AMMETER
LA	LIGHTNING ARRESTOR
SY	SYNCHROSCOPE
DS	DISCONNECTING SWITCH
ES	EARTH SWITCH
12	OVER SPEED RELAY
13	SYNCHRONOUS SPEED RELAY
14	UNDER SPEED RELAY
41	FIELD CIRCUIT BREAKER
52E	EXCITATION CIRCUIT BREAKER
67	DIRECTIONAL D/C & E/F
79	AC RECLOSING RELAY





EQUIPMENT SPECIFICATIONS

Major Equipments to be installed in the power house and connection and delivery point are listed below.

Turbine

Type	: Pelton
Number	: 2
Rated Output Capacity per unit	: 2.22MW
Turbine Axis Level	: 939.50msl
Net Head	: 171.58m
Discharge per Unit	: 1.455m ³ /s
Efficiency	: 91.00%

Governor

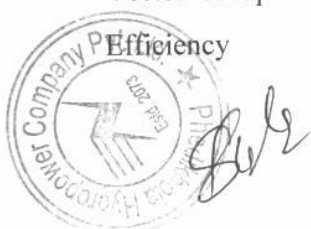
Type	: Electronic Digital /Hydraulic
Adjustment for Speed Drop	: Between 0 to 5%

Generator

Type	: Synchronous, 3-Phase
Rated Output Capacity per Unit	: 2.53MVA
Power Factor	: 0.85
Voltage	: 6.6kV
Frequency	: 50 Hz
No of Units	: 2
Excitation System	: Brushless
Efficiency	: 97.00 %

Transformer

Type	: 3-Phase, ONAN, Cooled 50 Hz
Rated Capacity	: 5.5MVA,
Voltage Ratio	: 6.6/33 kV and 33/132kV(5.5MVA)
No of Units	: (1)6.6/33 kV and 33/132kV(1)
Vector Group	: Ynd11 , YnYno
Efficiency	: 99.00 %



33kV Circuit Breaker

Type	Vacuum, outdoor
No of poles	3
Voltage Rating	
Nominal system voltage	33kV
Rated maximum voltage	36kV
Current Rating	
Rated continuous current	800A
Rated short circuit breaking current	31.5kA
One minute power frequency withstand voltage rms	75kV
Impulse withstand voltage peak	170kV
Frequency	50Hz
Re-closing duty cycle	0-0.3sec-CO-3min-CO

33kV Disconnecting switch

Type	3-pole, Single throw, outdoor
Voltage Rating	
Nominal system voltage	33kV
Rated maximum voltage	36kV
Current Rating	
Rated continuous current	800A
Rated short circuit breaking current	31.5kA
Rated peak withstand current	63kA
One minute power frequency withstand voltage rms	75kV
Basic impulse level (BIL)	170kV
Frequency	50Hz
Operating mechanism	Manually gang operated

33kV Current Transformer

Type	Outdoor
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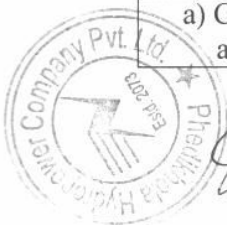
Voltage Rating	
Nominal system voltage	33kV
Rated maximum voltage	36kV
Impulse withstand voltage	170kV
Frequency	50Hz
Short time thermal ratings	10kA for 1sec
Current Ratio	100/1 at Generator's side
Burden	30VA for protection and general metering 15VA for Main and check metering
Accuracy	0.5 for general metering 5P20 for protection PS for differential protection 0.2 for measuring

33kV Voltage Transformer

Type	Outdoor
Rated primary voltage	33kV/ $\sqrt{3}$
Rated secondary voltage	110V/ $\sqrt{3}$
Impulse withstand voltage	170kV
Frequency	50Hz
Burden	30VA for protection and general metering 15VA for Main and Check meter
Accuracy	0.5 for general metering 5P for protection 0.2 for measuring

132kV SF6 CIRCUIT BREAKERS

DESCRIPTION	UNIT	SPECIFICATION
Applicable standard		IEC
Type		SF6, outdoor
Poles	No.	3
Rated voltage	kV	132
Rated current		
a) Continuous at 40 degree C ambient	A	1250



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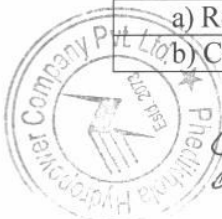
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OPERATION DEPARTMENT
Baneshwor, Kathmandu

Rated short circuit breaking current	kA	40
Frequency	Hz	50
Closing time	ms	100
Max.Make Time	ms	120
Max. capacitive current breaking capacity (rms)	A	50
Operating duty cycle		0-0.3 sec-CO-3 min-CO

132kV DISCONNECTING SWITCHES

DESCRIPTION	UNIT	SPECIFICATION
Applicable standard		IEC
Type		3 pole, single throw, outdoor, Center Break
Frequency	Hz	50
Rated voltage	kV	132
Rated current		
a) Continuous at 40 degree C ambient	A	1250
b) Short time current for 1 sec	kA	40
Insulation level		
a) Impulse withstand voltage	kV(crest)	650
b) Power frequency withstand voltage (1 min, rms)	kV	275
Main contacts		
- Material of fixed contacts		copper alloy
- Coating of fixed contacts		Silver plated
- Material of moving contacts		
- Coating of moving contacts		Silver plated
- Material of the contacts of the earthing switch		copper alloy
- Coating of the contacts of the earthing switch		silver plated
Operating mechanism		Motor and Manual operated
No of operations switch can withstand without deterioration of contacts	Nos.	minimum 1000
Auxiliary power supply		
a) Space heater and cubicle	V, Phase	230V ,1Ph
b) Control circuit	V, Phase	110V DC
c) Operating motor	V, Phase	400/230V AC
Local operating device provided	Yes/No	Yes
Insulator		
a) Reference standard		IEC
b) Creepage distance in air	mm	3300



c) Number of Stacked/type	No.	1/Solid Core Post Type
Enclosure protection		IP-55W
Thickness of sheet (minimum)	mm mm	2 (for steel) 3 (for Al. alloy)
Earthing switch		
a) Operating mechanism		Manual
b) Type of interlocks furnished		Electrical & Mechanical

132kV VOLTAGE TRANSFORMER

DESCRIPTION	UNIT	SPECIFICATION
Applicable standard		IEC
Type		Outdoor ,Oil Immersed
Number of phases	No.	Three
Frequency	Hz	50
Rated primary voltage		
Normal	kV	$132/\sqrt{3}$
Maximum	kV	$145/\sqrt{3}$
Insulation level		
a) Impulse withstand voltage (Peak)	kV	650
b) Power frequency withstand (1 min. rms) (primary)	kV	275
Creepage distance	mm	3300
PT For Line		
a) Voltage ratio	kV	$132/\sqrt{3}:0.11/\sqrt{3}:0.11/\sqrt{3}$
b) Rated burden	VA	50, 50VA
c) Accuracy class		3P , 0.5
PT For Line (Line side)		
a) Voltage ratio	kV	$132/\sqrt{3}:0.11/\sqrt{3}:0.11/\sqrt{3}$
b) Rated burden	VA	50, 50VA
c) Accuracy class		3P , 0.5
For main and check meter		$132/\sqrt{3}:0.11/\sqrt{3}:0.11/\sqrt{3}$, 0.2-0.2CL, 15-15VA



132kV CURRENT TRANSFORMER

DESCRIPTION	UNIT	SPECIFICATION
Applicable standard		IEC
Type		Outdoor, Oil immersed
Number of phases	No.	3
Frequency	Hz	50
Rated Primary Voltage		
Nominal	kV	132
Maximum	kV	145
Insulation level		
Impulse withstand voltage(peak)	kV	650
Power frequency withstand voltage (1min, rms)	kV	275
Creepage distance	mm	3300
CT For Core-1, Transformer Diff. Prot. Core-2, Main Prot.	A	30/1 30/1/1/1
Accuracy class Rated VA burden for each core	VA	PS, 5P20, 0.5, PS 30
For main and check meter at upper irkhwa hpp switchyard	VA	30/1-1, 0.2-0.2Cl, 15-15VA for phedi khola hpp (100/1-1, 0.2-0.2Cl, 15-15VA for upper Irkhwa hpp)

132 kV Lightning Arrester

Type	Outdoor, gapless ZnO arrester
Frequency	50 Hz
System voltage	132 kV
Rated voltage	120 kV
Impulse withstand voltage (BIL)	650 kV



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Power frequency withstand voltage	275 kV
Nominal discharge current	10 kA

132/220kV, 25MVA Power Transformer (At Tumlingtar substation) combined capacity

Number of unit	1 (One)
Type	Three phase, oil-immersed
Installation	Out door
Rated Capacity	25MVA
Rated HV	220kV
Rated LV	132kV
Efficiency	0.99
Cooling	ONAN
Rated Frequency	50Hz
LV winding	Star
HV winding	Star
Vector Group	YNyn0
Tap Changer	Off load, $\pm 5\%$ in steps of $\pm 2.5\%$
Material of conductor	copper

220kV Surge Arrestors:

Description	Unit	Specification
Rated voltage	kV	200
Nominal discharge current	kA	10

220kV Disconnectors:

Description	Unit	Specification
Rated voltage	kV	220
Rated normal current	A	1250
Rated normal short circuit current	kA	40
Insulation Level:		
Impulse withstand voltage(Peak)	kV	1050
Power frequency withstand voltage(1min,rms)	kV	460

220kV Circuit Breakers:



Description	Unit	Specification
Rated voltage	kV	220
Maximum voltage	kV	245
Rated current	A	1250
Rated breaking current	kA	40kA
Insulation Level:		
Impulse withstand voltage(Peak)	kV	1050
Power frequency withstand voltage(1min,rms)	kV	460

220kV Voltage transformers:(General PT)

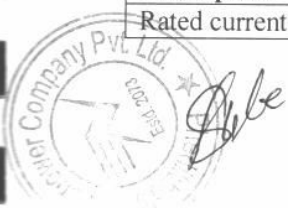
Description	Unit	Specification
Maximum System Voltage	kV	245
Operating voltage	kV	220
Ratio	kV	$220/\sqrt{3}/0.11/\sqrt{3}/0.11/\sqrt{3}$
Accuracy class		3P, 0.5
Burden	VA	30
Insulation Level:		
Impulse withstand voltage(Peak)	kV	1050
Power frequency withstand voltage(1min,rms)	kV	460

220kV Voltage Transformer(Main and Check Meter)

Description	Unit	Specification
Maximum System Voltage	kV	245
Operating voltage	kV	220
Ratio	kV	$220/\sqrt{3}/0.11/\sqrt{3}/0.11/\sqrt{3}$
Accuracy class		0.2,0.2
Burden	VA	15
Insulation Level:		
Impulse withstand voltage(Peak)	kV	1050
Power frequency withstand voltage(1min,rms)	kV	460

220kV Current Transformer (General)

Description	Unit	Specification
Rated current ratio	A	75/1-1



Burden	VA	30
Accuracy Class		5P20,0.5
Insulation Level:		
Impulse withstand voltage(Peak)	kV	1050
Power frequency withstand voltage(1min,rms)	kV	460

220kV Current Transformer (for Main and check Meter)

Description	Unit	Specification
Rated current ratio	A	75/1-1
Burden	VA	15,15
Accuracy Class		0.2, 0.2
Insulation Level:		
Impulse withstand voltage(Peak)	kV	1050
Power frequency withstand voltage(1min,rms)	kV	460

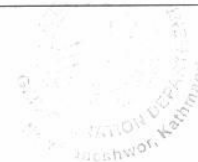


EXHIBIT - 10 METERING SCHEME

Metering arrangements in the User System and at the Connection shall be indicated in this Exhibit in accordance with Chapter 9 of the NEA Grid Code.

Metering scheme is shown on the Connection Point Diagram Exhibit-3 Attachment.

- a. The Delivery Point shall be the 220kV bus bar of under construction 220/132/33kV Khandbari(Tumlingtar) Substation of NEA. The Grid User needs to install necessary bays, other necessary equipment at its own cost at the underconstruction 220/132/33kV Khandbari(Tumlingtar) Substation of NEA for the interconnection of project with the INPS.
- b. Grid User shall install the Main and Check energy Meters of accuracy class 0.1 at the Delivery Point as shown in Exhibits 2 and 3.
- c. The Main and Check Meters shall be supplied from the different secondary cores of CT and PT of accuracy class 0.2
- d. Provisions for sealing of all energy meters including secondary terminals of instrument transformers shall be made by both parties for preventing unauthorized use.
- e. The burden of instrument transformers shall comply with the Grid Code as described in Chapter 9.
- f. The issue of metering of Phedi Khola (Thulung) Hydropower Project (4.3MW) and Upper Irkhuwa Hydropower Project (14.5MW) and combine losses of these projects shall be as per sheet attached herewith.



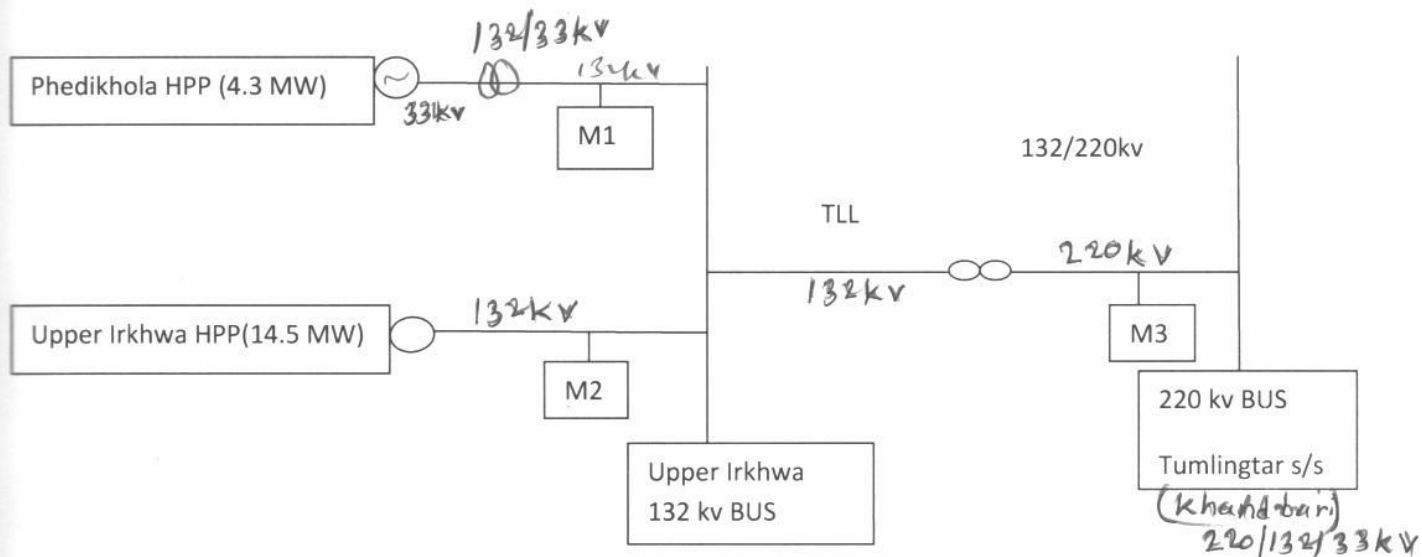


Figure: Power evacuation of Phedikhola & Upper Irkhwa hydropower projects at 220 kv Bus of NEA's Tumlingtar Substation

Metering Scheme and loss details of ^{phedi khola & upper Irkhwa} ~~sabha-B & Sabha-C~~ Hydropower Projects

M1(D)= Delivered Energy by Phedikhola HPP(4.3 MW) Recorded at 132 kv bus of Upper Irkhwa HPP s/y (MWh)

M2(D)=Delivered Energy by Upper Irkhwa HPP (14.5 MW) Recorded at 132 kv bus of Upper Irkhwa HPP s/y (MWh)

M3(D)= Cumulative Delivered Energy By Phedikhola HPP (4.3MW) and Upper Irkhwa HPP (14.5MW) recorded at 220kv Bus of Tumlingtar S/S (mwh)

MD(t)=Total Delivered Energy By Phedikhola (4.3MW) and Upper Irkhwa HPP (14.5MW) recorded at 132 kv Bus of Upper Irkhwa HPP S/Y (mwh)

$MD(t)=M1(D)+M2(D)$

M1(R)=Received Energy by Phedikhola HPP (4.3MW) recorded at 132 kv Bus of Upper Irkhwa HPP S/Y (MWh)

M2(R)=Received Energy by Upper Irkhwa HPP (14.5MW) recorded at 132 kv Bus of Upper Irkhwa HPP S/Y (MWh)

M3(R)=Cumulative Received Energy by Phedikhola HPP (4.3MW) and Upper Irkhwa HPP (14.5 MW) recorded at 220 kvBus of Tumlingtar S/S (MWh)

MR(t)= Total Received Energy by Phedikhola HPP (4.3MW) and Upper Irkhwa HPP (14.5 MW) recorded at 132kv Bus of Upper Irkhwa HPP S/Y (MWh)

$MR(t)=M1(R)+M2(R)$

I. If $MR(t) \leq (M3(R))$ Then,

A) Transmission line loss of Section Upper Irkhwa HPP S/Y- Tumlingtar S/S =TLL (MWh)



Signature of B. K. Shrestha, Khatmandu

$$TLL = [MD(t) - M3(D)]$$

B) Transmission line loss Share by Phedikhola HPP (4.3MW):

$$TLL1 = [M1(D)/MD(t)] * TLL$$

Total Delivered Energy by Phedikhola HPP at 220 kV Tumlingtar S/S (MWh) = $[M1(D) - TLL1]$
 Received Energy of Phedikhola HPP at 220 KV Tumlingtar S/S (MWh) = $[M1(R)/MR(t)] * M3(R)$

C) Transmission line loss Share by Upper Irkhwa HPP (14.5 MW):

$$TLL2 = [M2(D)/MD(t)] * TLL$$

Total Delivered Energy by Upper Irkhwa HPP at 220 kV Tumlingtar S/S (MWh) = $[M2(D) - TLL2]$
 Received Energy of Upper Irkhwa HPP at 220 KV Tumlingtar S/S (MWh) = $[M2(R)/MR(t)] * M3(R)$

II. If $MR(t) > M3(R)$ Then,

A) Transmission line loss of Section Upper Irkhwa HPP S/Y-Tumlingtar S/S = TLL (MWh)

$$TLL = MD(t) - [MR(t) - M3(R)] - M3(D)$$

B) Transmission line loss Share by Phedikhola HPP (4.3 MW):

$$TLL1 = [M1(D)/MD(t)] * TLL$$

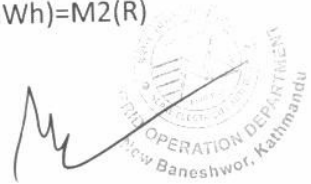
Total Delivered Energy by Phedikhola HPP at 220 kV Tumlingtar S/S (MWh) = $[M1(D) - TLL1]$
 Received Energy of Phedikhola HPP at 220 kV Tumlingtar S/S (MWh) = $M1(R)$

C) Transmission line loss Share by Upper Irkhwa HPP (14.5MW):

$$TLL2 = [M2(D)/MD(t)] * TLL$$

Total Delivered Energy by Upper Irkhwa HPP at 220 KV Tumlingtar S/S (MWh) = $[M2(D) - TLL2]$

Received Energy of Upper Irkhwa HPP at 220 kv Tumlingtar S/S (MWh) = $M2(R)$



०७९/८०

पत्र संख्या:-

च.नं.: २११

नेपाल सरकार

ऊर्जा, जलस्रोत तथा सिंचाइ मन्त्रालय

विद्युत विकास विभाग

(.....)

फोन नं.: { ४४३४११९
४४११५३७
१४४५५९१
४४३९३६७

फ्याक्स: ४४३५९०३

पोष्ट बक्स नं.: २५००७

सानो गौचरुण, काठमाडौं, नेपाल

मिति:

फेदी खोला (थुम्लुंग) साना जलविद्युत आयोजना बारे।

विषय:-

श्री फेदी खोला हाइड्रोपावर कम्पनी प्रा.लि.

काठमाडौं-३२, तिनकुने, काठमाडौं

फोन: ०१-४४१९३२१, ९८५१२२१३७२

प्रस्तुत विषयमा तहाँबाट फेदी खोला (थुम्लुंग) जलविद्युत आयोजनाको क्षमता थपको लागि पेश भएको निवेदन उपर कारवाही हुँदा विद्युत आयोजनाको अनुमतिपत्र सम्बन्धि निर्देशिका, २०७५को दफा १६(२)को अधिनमा रही यस आयोजनाको तल्लो तटमा रहेको माथिल्लो इर्खुवा खोला जलविद्युत आयोजनालाई प्रतिकुल असर नपर्ने गरी अध्ययन गर्न, क्षमता ४.३ मे.वा. कायम गर्न तथा क्षेत्र निम्नानुसार कायम गर्न सैद्धान्तिक सहमति प्रदान गरिएको व्यहोरा विभागको मिति २०७९/०५/०८को निर्णयानुसार अनुरोध छ। साथै, सोहि निर्देशिकाको दफा १६(३) मा उल्लेख बमोजिम आवश्यक विवरणहरु पेश गरे पश्चात विद्युत उत्पादन अनुमतिपत्र वि.उ. २९३ संसोधनको कारवाही गरिने व्यहोरा समेत अनुरोध गरिन्छ।

सैद्धान्तिक सहमति प्रदान गरिएको क्षेत्र:

दक्षिण :	२७° २२' १३" N	देखि	उत्तर :	२७° २३' ०६" N सम्म
पूर्व :	८७° ०१' ३८" E	देखि	पश्चिम :	८७° ००' २९" E सम्म

Sanyar
05/2/2022

(सकृय न्यौपाने)

इन्जिनियर