

Salient features

General

Name of the Project	Lower Modi Hydroelectric Project
Name of the River	Modi Khola
Type of Scheme	Run-of-the-river
Project Location	Deopur, Bajung, Tilahar and Chuwa VDC
District	Parbat
Zone	Dhaulagiri
Development Region	Western
Nearest town	Kusma Bazar
Access	Pokhara-Baglung Highway
Latitude	28 ⁰ 14' 08" N to 28 ⁰ 16' 18" N
Longitude	83 ⁰ 42' 30" E to 83 ⁰ 44' 43" E
Gross Head	87.79 m
Net Head @ full discharge	83.37 m
Design Discharge	28.80 m ³ /s
Installed Capacity	20.00 MW
Plant Factor	58 % on net saleable energy
Net Annual Generation	117.53 GWh on net saleable energy

Hydrology

Catchment Area	560 km ²
Catchment Area below 3000m	231.7 km ²
Long term Average Flow	54.62 m ³ /s
Minimum Monthly Flow	9.15 m ³ /s
Design Discharge	28.80 m ³ /s
Design 100 yrs Flood Discharge	799.755 m ³ /s

Weir

Location	Bajung and Tilahar V.D.C.
Type	Ogee shape, overflow type
Crest Length	35 m
River Bed Level at Weir Location	859.00 m
Weir Crest Level	862.87 m

Intake

Type	Side Intake (Orifice)
Number of orifice	4
Size	4.7 m X 2.2 m (W x D)
Invert Level	860.50m

Undersluice

No of Units	2
Width	6 m

Gravel Trap

Type	Surface
Particle Size to be settled	> 2 mm
Number of Basin	2
Gravel Trap Size	15 m x 9 m x 5 m (L x W x D)
Spillway Length	10.00 m

Settling Basin cum Forebay

Type	Surface
Particle Size to be settled	≥ 0.2 mm
Number of Units	2
Inlet Transition Length	31 m
Settling Basins Size	113 m x 16 m x 7.95 m (L x W x D)
Forebay Size	7 m x 32.4 m x 10.20 m (L x W x D)
Spillway Length	20 m

Headrace Tunnel

Shape	Inverted D shaped
Type of lining	Shotcrete, Concrete
Diameter	4.05 m x (2.025 m + 2.025 m) (W x D)
Length	4,021 m

Surge Shaft

Type	Circular, concrete, vertical, non-spilling
Diameter	10 m
Height	57.50 m
Water level in upsurge	877.08 masl
Water level in downsurge	844.91 masl
Crown level of surge shaft	885.57 masl
Invert level of surge shaft	828.08 masl

Penstock

Type	Subsurface
Material	Mild Steel
Lengths	454 m
Diameter	3.5 m
No of Branches near Turbine	2
Diameter of each Branch	2.5 m
Thicknesses	12 mm - 18 mm

Powerhouse

Location	Chuwa V.D.C
Type	Semi-Surface
Dimension	21.735 m x 30.7 m x 22 m

Turbine

Type	Vertical Axis, Francis
Number of Units	2
Axis Level	776.93 masl
Efficiency	90%
Speed	750 rpm
Rated output	2 x 10000 kW

Tailrace Canal

Type	Rectangular
Size	3.25 m x 3.25 m (W x D)
Length	44 m

Generator

No of generator	2
Power Factor	0.8
Speed	750 rpm
Efficiency	95.5%
Rating	12.5MVA
Number of Poles	8
Frequency	50 Hz
Rate Voltage	6.3 kV

Transformer

No of Units	2
Type	3-Phase, ONAN Cooled
Efficiency	99%
Rating	12.5MVA
Frequency	50 Hz

Transmission Line

Transmission Voltage	132 kV
Length	4.2 km
Connection Point	NEA Modi Hydroelectric Project substation

Power and Energy

Installed Capacity	20.00 MW
Dry Season Energy	19.82 GWh
Wet Season Energy	97.70 GWh
Total Annual Energy	117.52 GWh
Overall Efficiency	85.09%

Financial Indicators

Project Cost (1US\$=Rs 85)	US\$ 41.29 Million
Debt Equity Ratio	75: 25
Financial Internal Rate of Return (FIRR)	16.08%
Benefit Cost Ratio	2.15%
Cost Per kW	US\$ 2,065