

ANNEXURE 16
NYUKCHARONG CHU HYDRO ELECTRIC PROJECT
SALIENT FEATURES

ACCESSIBILITY	
State	Arunachal Pradesh
District	Tawang
River	Nyukcharong Chu
Nearest Airport	Guwahati
Nearest rail head	Nagaon
GEOGRAPHICAL LOCATION	
Barrage	Latitude: 27° 38' 21.3" N Longitude: 92° 00' 20.9" E
Power house	Latitude: 27° 37' 21.4" N Longitude: 92° 00' 41.3" E
HYDROLOGY	
Catchment area at Barrage site	2040 sq km
SPF	2857 m ³ /sec (SPF)
GLoF	1426 m ³ /sec
Diversion Flood (1: 25 yr monsoon flood)	650 m ³ /sec
RESERVOIR	
Full Reservoir Level (FRL)	El 2470.0 m
Minimum Drawdown Level (MDDL)	El 2460.0 m
Gross storage at FRL	0.106 M cum
Live storage	0.09 M cum
Area under Submergence at FRL	1.71 ha
DIVERSION STRUCTURE	
Type	Barrage
Length	74.2 m
Top of Barrage	EL 2472.0 m
SPILLWAY	
No. of Barrage bays	6 Nos.
Opening size	(9.2 m (w) x 6.0 m (h) each)
Crest Level	El 2450.0 m
Design Flood (SPF+GLoF)	4837 cumec
Size of stop log gate (1 set)	9.2m (w) x 9.51m (h)
Size of radial gate (6 nos.)	9.2 m (w) x 6.31 m (h)
INTAKE	
Number	Two
Invert level	El 2452.25 m
Size of emergency gate opening (2 nos.)	3.5m (w) x 3.5m (h)

Size of service gate opening (2 nos.)	3.5m (w) x 3.5m (h)
Trash rack (6 sets)	2.7m (w) x 6.85m (h)
Design discharge	31.66 cumec each
FEEDER TUNNELS	
Number	Two
Size	3.5 m
Shape	D- shape
Length	317m / 264.4m
Design discharge	27.53 cumec each
Velocity	2.52 m/s
DESILTING CHAMBERS	
Number	Two
Size / Shape	10.0 m(W) x 12.5 m(H), Dufor type
Length	200 m
Inlet discharge	31.66 cumecs each
Size of gate opening (2 nos.)	3.5m (w) x 3.5m (h)
SILT FLUSHING TUNNEL	
Number	Two combined into one
Size of Duct up to Gate Chamber	Duct -1.25m (w) x 1.25m (h) in 2.5 m dia. D-shaped Tunnel
Size of SFT after Gate Chamber up to junction	Channel -2.0m (w) x 1.0m (h) in 2.5 m dia. D-shaped Tunnel
Size of SFT after Junction up to portal	Channel -2.0m (w) x 1.5m (h) in 2.5 m dia. D-shaped Tunnel
Service Gate (2 nos.)	1.25 m x 1.25m (w x h)
Emergency Gate (2 nos.)	1.25 m x 1.25m (w x h)
Length up to Gate Chamber	86 m/ 54m
Length from Gate Chamber up to Junction	32 m/ 26m
Length after junction up to portal	28m
Silt flushing discharge	4.13 cumec each
LINK TUNNEL TO HRT	
Number	Two
Size	3.5 m
Shape	D- shape
Length	91 m
Design discharge	27.53 cumec each
HEAD RACE TUNNEL	
Number	One
Size	4.8 m
Shape	Modified Horse-Shoe shape
Length	1271 m

Design discharge	55.06 cumec
Velocity	2.54 m/s
SURGE SHAFT	
Number	One
Type	Restricted Orifice Type
Size	7.0 m diameter
Orifice dia	2.3m
Height	62.0 m
Top EL	EL 2496.5 m
Tunnel invert	EL 2430.0 m
Size of gate opening (1 no.)	3.7m (w) x 3.7m (h)
Maximum surge level	EL 2494.7 m
Minimum surge level	EL 2436.7 m
PRESSURE SHAFT/TUNNEL	
Main Pressure shaft/tunnel	Numbers – One Size - 3.7 m dia, Length - 211.7 m
Pressure tunnel after 1 st bifurcation	Numbers – Two Size - 3.0 m dia & 2.2 m dia, Length - 20.5m & 49 m
Pressure tunnel after 2 nd bifurcation	Numbers – Two Size – 2.2 m dia & 2.2 m dia.Length - 34.5m & 40.3 m
POWER HOUSE	
Type	Underground
Installed capacity	96 MW
Number of units	3 x 32 MW
Power house cavern size (LxWxH)	87 m x 19m x 37.5 m
Type of turbine	Vertical axis Francis turbine
C.L. of turbine	El 2265.5 m
Rated Head	191.12 m
Transformer cavern size (LxWxH)	60 m x 14.0m x 19.0 m
No. & Type of Transformers	3 Nos., 3 Phase, 40 MVA
POTHEAD YARD	
Type	Surface
Size	20 m x 57 m
DRAFT TUBE GATE CHAMBER	
Type	Underground
Size (L x W x H)	37.0 m x 6.0mx 8.0 m
Size of gate opening (3 nos.)	4.6m (w) x 2.5m (h)
Draft tube length (up to gate)	49.5 m
TAIL RACE TUNNEL	
Type	Modified Horse Shoe Shape
Size	5.5m dia

Length	119.0 m	
Design Discharge	55.06 cumec	
River Bed Level	El 2265.0 m	
Minimum TWL	El 2268.59 m	
Normal TWL	El 2270.87 m	
Maximum TWL	El 2277.60 m	
Number & Size of TRT gate opening (1 no.)	5.5m (w) x 5.5m (h)	
Type of Gate	Vertical lift gate	
POWER GENERATION		
Installed capacity	96 MW (3x32 MW)	
Annual energy generation with plant load factor		
Parameters	Annual energy generation	plant load factor
90% dependable yr. with 100% machine availability	473.24 GWh	56.27%
90% dependable yr. with 95% machine availability	466.12 GWh	55.43%
COST ESTIMATES & FINANCIAL ASPECT (Rs. Crores)		
Civil Works	549.53	
Electro Mechanical Works	152.18	
Sub Total	701.71	
Interest during construction	155.55	
Escalation	131.67	
Financing cost	6.97	
Total (Generation)	995.90	
TARIFF (With 12% free power)		
Tariff for first year	Rs. 5.32/kWh	
Levellised Tariff	Rs. 4.66/kWh	
PRE-CONSTRUCTION PERIOD	16 months	
CONSTRUCTION PERIOD	3.5 years	

Signature:

Name:

Designation:

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