PARE HYDRO ELECTRIC PROJECT (110 MW)

The Pare H.E. Project is situated in the Papum Pare District of Arunachal Pradesh. NEEPCO has taken up this Project to harness the Hydropower potential of the river Dikrong which is a tributary of river Brahmaputra and also utilize the Tail race discharge of the 405 MW Ranganadi H.E. Project stage. The project is a run of the river scheme. The project will have a 63 m High Concrete Gravity Dam and 2.828 Km long Head Race Tunnel (HRT). The installed capacity of the Project is 110 MW and the catchment area of the Project is 824 Sq. Km with maximum available head of about 67.36m. CEA has accorded TEC to the project on 24.09.07 with annual 506.42 MU of energy. The CCEA clearance of the project was accorded on 4th Dec'08 at an approved estimated cost of Rs.573.99 crs. Including IDC and finance Charges of Rs.68.06 crs at June, 2007 Price Level. However, due to a range of factors beyond the scope of control of NEEPCO viz. poor geology, parallel construction of Trans Arunachal Highway through the Project area, flash flood, law and order problem etc. the Project has suffered time and cost over-run. The revised date of commissioning of the Project is December 2017. The CEA has vetted the RCE of the Project at January'16 PL at Rs. 1337.76 crs.

PARE HYDRO ELECTRIC PROJECT (2 X 55MW)
Installed Capacity: 110 MW
Status: Construction
State: Arunachal Pradesh
Revised Schedule of Commissioning: December 2017.

General	
Location	Papum Pare District, Arunachal Pradesh.
River	Dikrong River & Tail water discharge from 405 MW RHEP Power Station at Hoz.
Type of Development	Run of River
Hydrology	
At 90% dependable year	1980-81
Annual Inflow	3254.90 Mcum
Catchment Area	824 Sq. Km.
Land acquired	169.58 Ha + 7.79 Ha for R&R
R&R Expenditure	18.04 Crs.
CCEA Approval	4th December 2008
Cost of the Project	Original: Rs.573.99Crs (June 2007 PL) RCE: Rs.1337.76 Crs (January 2016 PL)
Commissioning Schedule	Original - August 2012 Revised - December 2017.
Design Energy	506.42 MU
Firm Power	27.73 MW
Tariff	Original: 1st year : Rs.2.38 per unit. Levellised : Rs.2.0. per unit
	Revised: 1st Year : Rs.6.81. Levellised : Rs.7.24
PPA	Assam, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Meghalaya & Tripura.
Status of Award Packages:	
Package - I – M/s HCC, Mumbai Package- II –M/s Precision Infratech, Ahmedabad) Package – III - Andritz Hydro, Mandideep, Near Bhopal Package – IV - Alstom T&D India Ltd Design and Review Consultancy Work: M/s. SNC-Lavalin Inc., New Delhi	
Salient Features	
Diversion Tunnel Package – I - (M/s HCC Ltd.)	328m
Details	Horse Shoe, Dia – 8m, Length: 265m + 63m = 328 m (Concrete lined)
Gate	1 No. 6.89 m x 8.0 m
Levels	Sill – 197.5 m, Top seal – 205.50 m, Top of pier – 220.50 m
Dam Package –I - (M/s HCC Ltd.)	
Type of Dam	Concrete Gravity Dam.
LAT / LONG of Major Structures	Dam – Lat- 27º14'13" N / Long- 93º48'56" E Power House – Lat- 27º12'43" N /Long- 92º48'17.64" E
Length / Height	Length:134.275 m Height: 63 m
Excavation	398000 cum
Concreting	1,88,763 cum
Dam Top Level	El: 248.00 m
FRL	El: 245.15m
MDDL	El: 240.00 m
Gross Storage	19.63 MCM
Live Storage	5.20 MCM
Max. Water Level	246.215 m
Gross Head	67.36 m
Deepest Foundation	El: 170 m
Average River Bed	EL:197 m
Spillway Type	Ogee Shaped
Spillway - Height of Breast Wall	18 m
Spillway - Capacity	5000 Cumec
Spillway Gates	3 nos (Block 5 to 7) 10.4 m (W) x 14 m (H)
Intake	
Gate No & Size	2 nos of size 6.5m (W) X 7.5m (H)

Invert level	225 m
Radial Gates	
a- Gate No & Size m	3 nos (block 5 to 7) 10.4 m (W) x 14 m (H)
Crest (Bottom of Radial gate)	216 m
Trunnion Level	224.87
Water Conductor System (Package – I - M/s HCC Ltd.)	
Tunnel Adits	2 Nos/ Adit I: 113 m & Adit- II: 84 m
Head Race Tunnel (HRT) - 3 Faces	Modified Horse Shoe - Length: 2818.73 m, Dia. = 7.50 m
Face I	778 RM
Face II	1268 RM
Face III	782 RM
Head Race Tunnel (HRT) Intake Trash Rack	
Surge Shaft Gate	1 no
Draft Tube Gates	4 nos
Radial Gates for Dam	3nos
High Pressure Tunnel (HPT)	
Gross Length	225m
Size	Dia. 6.4m, Bifurcated (penstock) Dia. 4.5m.
Surge Shaft (Package – I - M/s HCC Ltd.)	
Type	Restricted Orifice / Non overflow.
Size	Dia. : 18m. Height : 57.29 m Orifice : 2.90 m
Open Excavation	83,400 cum
Boring	59 RM
Lining	59 RM
Power House (Package – I - M/s HCC Ltd.)	
Type	Surface
Gross Head	73.61 m
Design Head	67.36 m
Size	68 m (L) x 31 m (W)
Excavation	1,25,000 cum
Concreting	41000 cum
Tail Race Channel	Open Channel – 53m (L) x 30.32 m (W)
Excavation - Tail Race Channel	40000 cum
Concreting - Tail Race Channel	15000 cum
Tail Water Level	168.95 m
Tail Water Level	169.82 m
HM Works (Package - II – M/s Precision Infratech Ltd.)	
Erection of steel liner	264.25 m
Electro-Mechanical Works (Package - III – M/s Andritz Hydro Ltd.)	
EOT Crane	1, 220/ 30 T, 20.5m
Penstock Valve	Butterfly
Main Inlet Valve	Lattice , Dia: 3.8m
Turbine	
Rated Output	55 MW
Turbine efficiency	92.20%
Net Rated Head	67.36 m
Net max/ min head	74.58 m/ 63.93 m
Runner Inlet/Outlet	Inlet: 2.763 m, 3.374 m , Discharge Dia: 3.210 m
Efficiency at Full Load	92.20%
Specific Speed	187.5 rpm
Design Discharge	185 Cumec
Generator	Andritz Hydro (Make)
Rated output	56.7 MW
Voltage	11 kV
Rated Stator Current	3200 A
Power Factor	0.9 (Lagging)
Efficiency at Full Load	95.14 %
Excitation System	Static,
Generator Transformer	Alstom, 2 Nos, 3- Phase, Outdoor.
Voltage Ratio	11/132 KV
Station Transformer	1.25 MVA
Transformer & Switchyard (Package IV –M/s Alstom T&D India Ltd.)	

Type	Outdoor
Size	99 m x 72 m
Bays	8 nos, 132 kV(2 GTG, 1 ST, 1 Bus coupler, 4 lines)
Tower foundations	37 nos
Equipment	127 nos
Stringing	3800 mtrs
Earthmat	6700 m
Earth pit	75 (untreated) + 27 (treated)
HV Switch Gear	SF-6,Outdoor
Voltage Rating	132 kV
Circuit Breaker short CKT rating	40 KVA
Evacuation System	132 kV LILO Transmission line RHEP – Itanagar = 2.54 Km 132 kV S/C LILO RHEP-Nirijuli Transmission line = 1.43 Km