

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

REVISED DETAILED PROJECT REPORT FOR

Construction of 400kV DC line with Quad Moose ACSR for a route length of 179.661kms from the proposed NPCL Generating station, Nandikur, Udupi district to the proposed 400/220kV sub station, Shantigram, Hassan District.

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

PROJECT AT A GLANCE

1 Project Name	Construction of 400kV DC line with Quad Moose ACSR for a route length of 180kms from the proposed NPCL Generating station, Nandikur , Udupi district to the proposed 400/220 kv sub station, Shanthigram, Hassan District.		
2 Location	Place	:	Nandikur- Hassan
	Taluk	:	Hassan
	District	:	Hassan
3	Sub station Details	:	
4 Line Details	Voltage and type	:	400kV Quad Moose from Nandikur to Shanthigrama
	Length	:	180.00 km - 400 kV (over head)
5 Estimated cost	a) Actual cost	:	52320.69 Lakhs
6 Revised DPR cost		:	50803.80 lakhs
7 Further Revised cost		:	55195.96 Lakhs
8 B C ratio		:	
9 MVA added		:	
10 Line added		:	180.00km -400 kV (over head)
11 TCCM Approval		:	
12 TAC Approval		:	Included in APW for the year 08-09
13 Budget Provision		:	

REVISED PROJECT REPORT

1.0 Pre-Amble:-

The project report for “ Construction of 400KV DC line with Quad Moose ACSR for a route length of 180 kms from the proposed 400kv Generating station Nandikur, Udupi district to the proposed 400/220kv Station, Shanthigrama, Hassan District” was approved for Rs. 52320.69 Lakhs vide OM No. B19/1250/04-05 Dt: 28.11.2007. The same was revised to Rs. 50803.80 lakhs vide OM. No. B19/1250/04-05 Dt: 04.11.2008. The some of the provisions made in the DPR, such as tree/crop compensation, afforestation cost in lieu forest area occupied etc., were found inadequate hence the DPR needs to be revised.

2.0 Reasons for revision.

2.1 The reasons for further revision are as under:

- a) The changes in the tower required for maintaining sufficient clearance in the forest area for movement of elephants, minimum tree felling, undulations in the hilly terrain, and other regions such as river bed, Nalas etc.,
- b) Additional towers required for avoiding of plantations and residential areas for maintaining wild life corridor and maintaining of minimum ground clearance of 15 mtr.
- c) Benching and revetments at hilly terrain and uneven lands.
- d) The rates of the DWA are considered for nearest amount as per actuals as per the award issued vide DWA No. CEE/T&P/TL-341/1577, 1578, 1579 Dt: 11.03.2009 placed on M/s. Deepak Cables (India) Ltd.
- e) The tree cut compensation assessed in the initial years of 2007 and is not near to the present rate to be paid and the same is to be revised considering the present rates furnished by Coffee Board, Cardomum Board, Rubber Board, cashew development board, Horticulture department, and Present market rates for commercial crops.

- f) Increase in the cost of afforestation as per forest department was not envisaged at the time of preparation of initial DPR.
- g) Railway supervision charges as per the estimates submitted to railways etc.,

3.0 Problems/New Proposals of Generating Stations:-

- 3.1 M/s.UPCL is establishing a 1015MW generating station at a distance of 4kms (approx) from the present propo 110/11kv Nandikur sub station.
- 3.2 It is proposed to evacuate power from the above generating station to the prop 400/220kv Shantigram sub station, Hassan by a 400kV transmission line with Quadruple Moose.
- 3.3 There is a proposal to link the proposed 600MW Generating station at Gundia by M/s KPCL to 400KV sub station, Hassan by a 400kVDC Quad Moose ACSR line.
- 3.4 The projects of constructing a 400kv DC Quad Moose ACSR line from NPCL Nandikur to Gundia via Generating stations of JTPCL (1000MW) and ONGC (1400MW) are also envisaged.
- 3.5 PGCIL is planning to take up linking of the 400/220kv Bastipur station with the proposed 400/220kv Shantigram station in their regional strengthening scheme.
- 3.6 Thus, the Generating station at Nandikur will be connected to many Generating stations.
- 3.7 KPTCL has proposed to establish 110/11kv sub station at Nandikur by constructing a 110kV DC line on 220-110kv Multi-circuit Multi-voltage towers for a route length of 20kms (approx) from the 220/110kv Khemar sub station to the prop Nandikur sub station. This work is in progress.
- 3.8 To minimize the corridor problems and also to provide better evacuation facilities from UPCL, Nandikur it is proposed to take the 220 KV line from the NPCL station to Khemar on the above towers and construct an independent 220kV DC line for a route length of

4.91kms from Nandikur Generating station to the Multi-circuit tower tap point at Nandikur towards Khemar.

3.9 The 400kV terminal bays at UPCL generating station shall be constructed by UPCL where as PGCIL will be requested to construct the same at the prop 400/220kV station, Shantigrama, Hassan Dist.

3.10 The volume of excavation in different soils is based on th PGCIL data and is assessed for Wet Black Cotton, Partially Submerged soil and Wet soils based on the volume of excavation available for Fully submerged soil.

3.11 The volume of M10 and M20, The quantities for the works of Benching and Rivetting are also based on the above data.

4.0 Design:-

As the design data for the above towers is not available in KPTCL for Quad Moose ACSR, the tenders for the project may be invited on design and engineering based methods.

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Construction of 400kV DC line with Quad Moose ACSR for a route length of 179.661kms from the proposed NPCL Generating station, Nandikur, Udupi district to the proposed 400/220kV sub station, Shantigram, Hassan District.		
GENERAL ABSTRACT		
		Rs in Lakhs
1	Construction of 400kV DC line with Quad Moose ACSR for a route length of 179.661kms from the proposed NPCL Generating station, Nandikur, Udupi district to the proposed 400/220kV sub station, Shantigram, Hassan District.	55195.96
2	Total project cost	55195.96

Certificate :- Certified that the project estimate has been prepared as per the rates put in to DWA and awarde vide DWA No. CEE/T&P/TL-341/1577, 1578, 1579 Dt: 11.03.2009 to M/s. Deepak Cables (India) Ltd, The tree cut compensation assessed as per the rates furnished by Coffee board, Cardomum board, Rubber board, Horticultuaral department, Present market rates for commercial crops and Aforesatation of forest cost as per forest department, Railway supervision charges as per the estimates submitted to railways etc., for most economical way of execution of work.

[Signature]
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Revised DPR		Rs in Lakhs
1	Material cost (Inclusive of cost of transportation, insurance charges and taxes)	31260.00
2	Spares	50.00
3	Erection/Labour charges (inclusive of all taxes)	2000.00
4	Civil Engineering Charges(inclusive of all taxes)	9925.00
5	Testing & Comissioning Charges	NA
6	Total Works Cost (sum of item nos. 1 to 5)	43235.00
7	Establishment charges at 5 % on works cost (5% of item no 6)	2161.75
8	Performance Guarantee and loss of interest on margin money for Bank Guarantee @ 0.1% on works cost (0.1% of item no 6)	43.23
9	Contingencies at 2 % on (works cost + Establishment charges.) (2 % of item nos 6 and 7)	907.93
10	Interest during Construction (4% on item nos. 6,7,8 and 9	1853.92
11	Total estimated cost for comparision purpose (sum of item nos. 6 to 10)	48201.84
12	Statutory charges like PTCC, Electrical Inspectorate charges,Payment towards civic bodies etc.,	10.00
13	Compensation cost for crop/Tree cutting forest clearance etc.,	6900.00
14	Detailed survey for the line	84.12
15	Total cost of the project (sum of item nos 11 to 14)	55195.96

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Sl. No.	Description	Unit	Quantity	Material Cost		Labour Cost	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
1	2	3	4	5	6	7	8
B1	Survey						
1	Check survey using their own equipment for 400 kV Plain terrain	km	86.783				
2	Check survey using their own equipment for 400 kV Hilly terrain	km	92.878			4,864.40	422,147.23
B1(a)	Design, developing Structural and Shop drawings of 400KV D/C Towers as per the Technical Specifications. And Fabrication of Proto type and Testing of Proto type up to destruction:	L/S			13,588,816.07	4,864.40	451,795.74
B2	Fabrication, galvanising and supply of various types of towers and tower parts, body extensions, leg extensions, stubs excluding bolts and Nuts						
I	Tower type 400 kV "DA"						
1	Normal (14.7781 MT per tower)	No/MT	107/1581.2567				
2	A+3 Mtrs Extension (2.0355MT per tower)	No/MT	21/42.7455				
3	A+6 Mtrs Extension (3.1422 MT per tower)	No/MT	30/94.266				
4	A+ 9 Mtrs Extension (4.2776 MT per tower)	No/MT	17/72.7192				
5	Stubs for Normal, 3 mtr & 6 mtr extension(0.41 MT per tower)	No/MT	90/36.9				
6	Stubs for 9 mtr extension(0.41 MT per tower)	No/MT	17/6.97				
II	Tower type 400kV "DB"						
1	Normal (24.2666MT per tower)	No/MT	156/3785.5896				
2	B+3 Mtrs Extension (3.686MT per tower)	No/MT	25/92.15				

Sl. No.	Description	Unit	Quantity	Material Cost		Labour Cost	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
1	2	3	4	5	6	7	8
3	B+6 Mtrs Extension (5.3778MT per tower)	No/MT	20/107.556				
4	B+9 Mtrs Extension (7.3706MT per tower)	No/MT	29/213.7474				
5	Stubs for Normal, 3 mtr & 6 mtr extension(0.8086 MT per tower)	No/MT	127/102.6922				
6	Stubs for 9 mtr extension(0.8086 MT per tower)	No/MT	29/23.4494				
III	Tower type 400kV "DC"						
1	Normal						
2	(25.5036 MT per tower)	No/MT	91/2320.8276				
3	C+3 Mtrs Extension	No/MT					
3	(3.5892 MT per tower)	No/MT	8/28.7136				
4	C+6 Mtrs Extension	No/MT					
4	(5.8603 MT per tower)	No/MT	16/93.7648				
5	C+9 Mtrs Extension	No/MT					
5	(8.0359 MT per tower)	No/MT	9/72.3231				
6	Stubs for Normal, 3 mtr & 6 mtr extension(0.9311 MT per tower)	No/MT	82/76.3502				
6	Stubs for 9 mtr extension(0.9311 MT per tower)	No/MT	9/8.3799				
IV	Tower type 400kV "DD"						
1	Normal						
1	(31.2651MT per tower)	No/MT	115/3595.4865				
2	D+3 Mtrs Extension	No/MT					
2	(5.1911MT per tower)	No/MT	11/57.1021				
3	D+6 Mtrs Extension	No/MT					
3	(7.4084 MT per tower)	No/MT	13/96.3092				
4	D+9 Mtrs Extension	No/MT					
4	(10.0129MT per tower)	No/MT	11/110.1419				
5	D+18 Mtrs Extension	No/MT					
5	(14.0702 MT per tower)	No/MT	8/112.5616				
6	D+25 Mtrs Extension	No/MT					
6	(37.722MT per tower)	No/MT	5/188.61				
7	Stubs for Normal, 3 mtr & 6 mtr extension(1.3751 MT per tower)	No/MT	91/125.1341				
8	Stubs for 9 mtr extension(1.3751 MT per tower)	No/MT	11/15.1261				
9	Stubs for 18 mtr extension(1.3751 MT per tower)	No/MT	8/11.0008				

Sl. No.	Description	Unit	Quantity	Material Cost		Labour Cost	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
		3	4	5	6	7	8
1	2						
10	Stubs for 25 mtr extention(1.3751 MT per tower)	No/MT	5/6.8755				
V	Tower type 400kV "DD(S)"						
1	Normal						
	(33.2936 MT per tower)	No/MT	60/1997.616				
2	D+3 Mtrs Extension	No/MT	12/62.2932				
	(5.1911 MT per tower)	No/MT	15/111.126				
3	D+6 Mtrs Extension	No/MT	9/90.4293				
	(7.4084MT per tower)	No/MT	529/15340.21				
4	D+9 Mtrs Extension	No/MT	7,842.30				
	(10.0477MT per tower)	No/MT	7,497.92				
	Sub Total :	No/MT					
	Total Weight of the Towers (Mild Steel)	No/MT					
	Total Weight of the Towers (High Tensile Steel)	No/MT					
B4	Stub setting templates	No/MT					
	Setting of stub templates and aligning dismantling and transportaion of templates from one location to another location for 400 KV	Loc	529	0.00	0.00	320.00	169,280.00
B5	Supply of Galvanised Bolts & Nuts	MT	463.1364	92,591.70	42,882,586.61	1,165.00	539,553.91
B6	Tower accessories :						
1	Anti-climbing devices as per approved tech.specifications	Set	529	2,562.90	1,355,774.10	500.00	264,500.00
2	Number Plates	No	529	53.40	28,248.60	22.00	11,638.00
3	Danger Boards	No	529	160.20	84,745.80	22.00	11,638.00
4	Circuit plate	No	529	106.80	56,497.20	22.00	11,638.00
5	Phase plate (Set of 6 No.)	Set	529	256.13	135,492.77	66.00	34,914.00
6	Earth bond 300 mm long	No	1,902	439.28	0.00	0.00	0.00
7	Earth bond 500 mm long	No	194	480.61	914,120.22	1,819.58	352,998.52
8	Grounding of tower with GI Pipe including the cost of GI pipe	Set	336.00	2,136.02	414,387.88	2,423.79	814,393.44
9	Grounding of tower with counterpoise	Set					
B7	Conductor & Earth wire :						
1	Moose Plain Terrian	Km	2,114.03	258,139.49	545,715,627.63	17,370.00	36,720,768.50
2	Moose Hilly Terrian	Km	2,262.51	258,139.49	584,042,681.89	22,580.00	51,087,432.45

Sl. No.	Description	Unit	Quantity	Material Cost		Labour Cost	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
1	2	3	4	5	6	7	8
3	Ground wire Plain Terrain	Km	176.17	44,322.50	7,808,272.22	5,640.00	993,595.92
4	Ground wire Hilly Terrain	Km	188.54	44,322.50	8,356,667.86	7,530.00	1,419,723.82
5	Quadruple Tension clamps for Quad Moose ACSR conductor	Set	5,076	32,962.90	167,319,680.40		0.00
6	Suspension clamps for Quad Moose ACSR conductor with arcing Horn	Set	918	15,888.65	14,585,780.70		0.00
7	Disc Insulator 160 KN (24*4 Nos per string for tension)	Nos.	487,296	806.94	393,218,634.24		0.00
8	Disc Insulator 120 KN (23*2 Nos per string for Suspension)	Nos.	35,880	682.34	24,482,359.20		0.00
B8	Accessories for Conductor :						
1	M S C Joints suitable for Moose ACSR	No.	1,102	850.45	937,550.35		0.00
2	Pre formed armour rods suitable for Moose ACSR	No.	648	1,652.45	1,070,787.60		0.00
3	Vibration dampers for Moose	No.	51,099	765.40	39,111,174.60		0.00
4	Quadruple Bundle Spacers for Moose ACSR	Nos	19,234	1,658.38	31,897,280.92		0.00
5	Quadruple Rigid Spacers for Moose ACSR	Nos	7,690	838.59	6,448,757.10		0.00
6	Repair Sleeves	Nos	881	278.87	245,553.20		0.00
B9	Hardware for Earthwire :						
1	M S C Joints suitable for Ground conductor	No.	73	223.49	16,231.51		0.00
2	Tension clamps for earthwire	No.	1,688	577.51	974,836.88	0.00	0.00
3	Suspension clamps for earthwire	No.	214	560.09	119,859.26	0.00	0.00
4	Repair Sleeves	No.	54	85.04	4,632.18		0.00
5	Vibration dampers for Ground wire	No.	3,816	391.60	1,494,345.60		0.00
B10	Clearing of Bushes						
1	Clearing for bushes tree branches etc., upto 3 Mtr. width for detailed survey 400 kV Plain terrain	KM	179.661		0.00	410.00	73,661.01
B11	SLA Allowance at 30%(35% for Udupi and 25% for Hassan)						46,131,363.01
B12	Miscellaneous and other unforeseen materials.	L/S			646,048.47		97,426.96
B13	TOTAL				3,126,000,000.00		200,000,000.00

Sl. No.	Description	Unit	Quantity	Material Cost		Labour Cost	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
1	2	3	4	5	6	7	8
	Civil portion						
C1	Excavation for foundation including Back filling, levelling of consolidation.(only labour):						
1	Normal Dry soil	CMT	23,901.46				
2	Dry fissured/Ordinary rock	CMT	70,141.71			1,483.35	35,454,229.21
3	Wet black cotton soil	CMT	31,030.51			2,966.70	208,089,408.09
4	Soft Fissured Rock	CMT	40,263.91			139.43	4,326,584.47
5	Fully submerged soil	CMT	8,883.03			494.45	19,908,488.58
6	Partly submerged soil	CMT	5,003.09			138.45	1,229,855.23
7	Wet soil	CMT	10,008.40			128.56	643,196.86
8	Hard Rock	CMT	8,010.53			988.90	9,897,310.72
9	Hard Laterite	CMT	5,537.11			1,875.00	15,019,746.82
C2	Foundation Concreting :					3,500.00	19,379,896.46
1	Concreting and curing M20	CMT	33,187.85				0.00
2	Concreting and curing M10	CMT	3,640.15			6,616.73	219,595,063.90
C3	Steel reinforcement (including material and labour)	MT	3,421,886.46			5,209.53	18,963,491.47
C4	Back filling					48.46	165,824,617.75
1	Back filling and levelling with available soil	CMT	0.00				
2	Back filling and levelling with borrowed soil for hard rock and WBC(with 1 km lead)	CMT	6,523.52			71.50	0.00
C5	Benching:					144.10	940,039.23
1	Benching : Earth work excavation for levelling and lowering the ground and removing the excavated earth to a distance not exceeding 50 Mtr. and lift up to 1.5 Mtr. and spreading and levelling etc., complete wherever necessary.						0.00
i)	Normal soil	cmt	18,960.10				
ii)	DFR/SFR	cmt	56,004.45			92.96	1,762,531.08
iii)	Hard Rock	cmt	30,605.15			266.01	17,557,844.28
						3,955.60	121,061,715.52

No.	Description	Unit	Quantity	Material Cost		Labour Cost	
				Unit Rate (in Rs.)	Amount (in Rs.)	Unit Rate (in Rs.)	Amount (in Rs.)
1	2	3	4	5	6	7	8
C6	REVETMENTS :						
1	Revetments : Bond stones 2 Mtr. apart (uncoarsed) including necessary excavation bed concrete with CC 1 : 4 : 8 of 0.15 Mtr thick and cement pointing in CM 1 : 3 including curing etc., with all lead and lift (only quantity of rubble stone is to be measured)						
a)	Excavation for foundation with all lead, lift and disposal						
i)	Normal soil	cmt	450.00				
ii)	DFR/SFR	cmt	3,200.00	1,483.35			667,507.50
iii)	Hard Rock	cmt	920.00	2,966.70			9,493,440.00
b)	SSM in cm 1:6 with pointing to the open faces	cmt	11,580.00	3,955.60			3,639,152.00
c)	Bottom Pad M10	cmt	1,080.00	4,119.76			47,706,820.80
d)	Top Pad M20	cmt	850.00	5,293.58			5,717,066.40
e)	Back filling and levelling with available soil	cmt	450.00	5,744.52			4,882,842.00
f)	Back filling and levelling with borrowed soil for hard rock and WBC(with 1 km lead)	cmt	30,000.00	71.50			32,175.00
C7	Area Weightage at 6%			144.10			4,323,000.00
C7	Miscellaneous						56,166,961.40
C8	Total						217,015.22
							992,500,000.00

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