



Establishment of 2 x 25 MVA, 132/33 KV Sub-station at Dharni, Dist. - Amravati

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Date: 31.10.2011

To,
The Secretary,
MERC, World Trade Centre,
13th Floor, Cuffe Parade,
Mumbai-400005

Sub: - EHV Proposal for "in-principle" approval from MERC for "Establishment of 2 x 25 MVA, 132/33 KV Sub-station at Dharni, Dist. - Amravati."

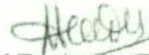
Respected Sir,

Please find enclosed herewith two copies of proposal of "Establishment of 2 x 25 MVA, 132/33 KV Sub-station at Dharni, Dist. - Amravati" in MAHARASHTRA STATE for in principle clearance from MERC.


Honorable Commission is requested to accord concurrence to the scheme please.

Thanking you.

Yours faithfully,



Chief Engineer (Trans. Project)

O/c


14.10.11
A.E.(S&C-II)

ASAd
14/10
E.E.(S&C-II)


14/10
S.E.(S&C)


02.11.11



MAHARASHTRA STATE ELECTRICITY TRANSMISSION COMPANY LIMITED



TRANSMISSION PROJECT DEPARTMENT

Establishment of 2 x 25 MVA, 132/33 KV Sub-station at
Dharni, Dist. – Amravati

96

2



INDEX OF EXECUTIVE SUMMARY

Sr. No.	Particulars	Page Nos.
1]	Introduction	5
2]	Methodology	6
3]	Background for "Establishment of 2 x 25 MVA, 132/33 KV Sub station at Dharni, Dist. – Amravati"	7-9
4]	Design Criteria	10-14
5]	a) Brief Scope of Work b) Objective	15
6]	Estimated Cost	16
7]	Cash Flow	16
8]	Funding Arrangement	17
9]	System study Report	18
10]	Detailed estimate, Single line diagram of SUBSTATION showing proposed arrangement etc.	19
11]	Impact on Tariff	20-22
12]	If Not Analysis	23
13]	If Deferred Analysis	23
14]	Justification of the scheme	23
15]	Alternative If Any	24
16]	Implementation And Monitoring	24



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EXECUTIVE SUMMARY

98

4




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1.0 Introduction:

After unbundling of the erstwhile MSEB, the company, MSETCL (Maharashtra State Electricity Transmission Company Limited) was established to look after planning, construction and maintenance of EHV network which was in the jurisdiction of MSEB. The total network spread across the State of Maharashtra, comprises of the following assets up to the year 2010-11.

EHV NETWORK OF MSETCL – 2010-11.

Particulars	500 kV HVDC	400 kV	220 kV	132 kV	110 kV	100 kV	66 kV	Total
No. of Sub-Stns.	2	21	158	252	33	36	34	536
Transformation capacity in MVA	3582	15180	35683	21911.5	2549	2575	1139	82619.50
Length of EHV Lines in Ckt. KM.	1504	6816.39	12567.91	11524.10	1700.00	685.87	3270	38068.27

As per the condition of State Grid Code – 2006 prescribed by MERC, the State Transmission Utility prepared a detailed five year plan for infrastructure development of MSETCL for the period 2010-11 to 2014-15. (Subsequent revision for F.Y2010-11 to 2014-15 has also been carried out by STU. The revised 5 year plan is on the web site 'www.maharashtraSTU.com'.)



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2.0 Methodology

The following methodology is adopted by STU for load flow study of the total EHV Network of MSETCL as a whole.

The EHV network of 400 kV, 220 kV & 132 kV are modeled in detail along with their respective capacities. To make critical analysis of the network in terms of voltage profile network loading, load flow studies are carried out on Mipower Software. The simulation was carried out by matching the power flows at 400 kV & 220 kV levels along with voltage profile at various buses.

The simulation study reveals that –

- The peak power losses in the system are to an extent of 4.38 %.
- 23 Nos. of 220 kV stations are recording voltage below 0.95 PU.
- 20 Nos. of 132 kV buses are recording voltage below 0.95 PU.
- 55 Nos. of 110 kV buses are recording voltage below 0.95 PU.
- 2 Nos. of 400 kV, 20 Nos. of 220 kV, 15 Nos. of 132 kV & 23 Nos. of 110/100 kV transformers are critically loaded.
- 04 Nos. of 220 kV lines, 08 Nos. of 132 kV lines & 110/100 kV lines are critically loaded.
- The system could not satisfy the security criteria as prescribed in the Grid Code.




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3.0 Background for Establishment of 2 x 25 MVA, 132/33 KV Sub-station at Dharni, Dist. – Amravati

Dharni city is situated in Melghat area which is tribal area in Amravati district which is the boundary of Maharashtra and from 20 Kms. thereafter, M.P. state starts.

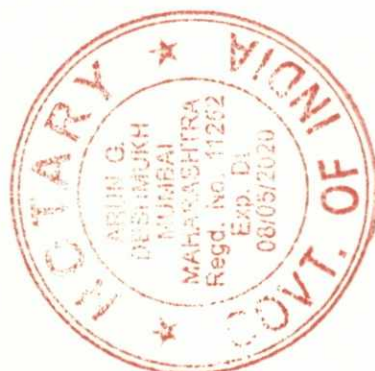
This place is about 150 Kms. away from Amravati district head quarter. Approach to Dharni is from Paratwada (Achalpur Camp) and after travelling of 100 Kms through forest one can reach Dharni. The area up to Dharni is very thick forest and hilly area and thereafter, forest is very thin and plain area of MP starts. Also, Melghat area is well known for tiger reserve project and tourist place. From Dharni onwards some major cities of MP state are situated such as Khandwa, Burhanpur and Indore. Most of the transport traffic is on this state highway from southern India to MP.

Presently, there are 02 Nos. of 33/11kV sub-stations in this area namely 33 KV Dabaka and Dharni S/S; both sub-stations are fed from 132 KV Hiwarkhed S/S on one 33 KV feeder. This 33 KV line length is about 90 Kms. and line passes through dense forest. Moreover, there is not any constructed road in forest along the line or in nearby area of line. In case of breakdown, the staff of Dharni Sub-Division (MSEDCL) has to travel more than 90 Kms. from Dharni to Hiwarkhed (Dist.: Akola) and from there to start patrolling of line through dense forest. In this situation, in rainy season, it takes more than 2-3 days to attend 33 KV line breakdowns.

In spite of keeping voltage level well above 34 KV at Hiwarkhed S/S 33 KV level voltage receiving at Dharni is 23 KV to 25 KV only. Efforts are being taken by MSEDCL to improve the voltage level at Dharni on 11 KV side by way of introducing voltage booster but cannot make expected improvement. Presently, in peak season the load of Dharni S/S is 7-8 MVA and Dabaka S/S is about 2 MVA. Also, one more 33 KV S/S at Kadhav is being commissioned 8 Kms. away from Dharni. Feeding these three 33 KV S/Ss will reach up to 12-14 MVA.

The land from Dharni onwards is very fertile and water potential is also very good but due to low voltage and interrupted power supply proper benefit cannot be taken. Moreover, due to power problem the projects started by Govt. for tribal area and primary health centre equipments are also suffering.

Dharni city is situated on important road route and hence, there is much more scope for small scale industries in this area but due to problems related to power supply no small scale




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industries are installed till date. Hence, if proper power supply is maintained there can be further fast load growth owing to additional revenue.

Therefore, it is proposed to erect 132/33 kV S/S at Dharni the primary source of 132 kV supply will be from nearest 220/132 KV Nepanagar sub-station in M.P. which is 55 Km. away from proposed 132 KV Dharni sub-station. The secondary source of 132 KV supply will be from Hivarkhed sub-station but for that permission from forest department and tiger reserve project will have to be obtained for erection of 132 KV Line from Hivarkhed to Dharni s/s.

To discuss various issues involved in extending 132 KV supply from M.P. to the proposed 132 KV Dharni sub-station, a meeting of MSETCL's and MPPTCL's officers was held at MPPTCL's Corporate Office, Jabalpur on 10th May, 2011. During meeting MPPTCL's officers suggested that 220 KV Nepanagar s/s (M.P.) would be better source instead of 132 KV Badgaon s/s (M.P.) for proposed 132 KV Dharni s/s. Therefore scheme proposed for 132 KV Dharni with source line from 132 KV Badgaon s/s (M.P.) has been modified and resubmitted for approval. Further during meeting following points are confirmed by both the authorities.

- 1) MPPTCL suggested that 220 KV Nepanagar (MP) will be the nearest (55 Km.) source to 132 KV Dharni s/s and also informed that space for one 132 Kv Bay is available at 220 KV Nepanagar s/s, which can be utilised for the proposed Line.
- 2) **Construction of Line:** MPPTCL informed that, MSETCL will have to construct the said Line. All the statutory approvals for Forest, PTCC and other clearances will have to be obtained by MSETCL from the concern authorities. MPPTCL also clarified that; the necessary license cover to MSETCL will be given during the construction activities of the said Line. MPPTCL also agreed to extend all kinds of help and coordination and seeking approvals for various clearances from M.P. and central Government.
- 3) **Commercial Aspect:** The commercial aspect of purchasing approx. 10 MW power from MPPTCL was also discussed in length. MPPTCL proposed that Maharashtra Electricity Transmission Co. Ltd. (MSETCL) should approach to Hon'ble Regulatory Commission for Long Term Open Access from MPPTCL.
- 4) **O&M Charges:** MPPTCL suggested that O&M charges of the proposed 132 KV Bay and Line will be applicable and will be finalised by separate mutual agreement.

Feasibility has been confirmed by MSETCL and MPPTCL in the minutes of joint meeting held on 10th May, 2011 at Jabalpur, M.P.




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Presently, it may seem that financially the returns are not up to mark from this 132 kV line and S/S but as soon as power supply condition improves rapid growth in revenue will occur.

Commissioning of this sub-station will deliver following benefits:

- 1) Load relief to existing 132 KV Hiwarkhed S/S.
- 2) 132 KV Dharni S/S can cater future load in nearby area.
- 3) Voltage profile will improve in Dharni-Hiwarkhed pocket due to reduction in length of 33 KV feeders.

This scheme is included in STU-Plan for the year 2011-12.

2x25 MVA, 132/33kV Transformers are available at Amravati Zone and proposed to be used for this scheme.

Total Scope of Work:

- 1) Establishment of 2x25 MVA, 132/33 KV Transformer with Bays.
- 2) Construction of 132 KV SCDC Line from 220 KV Nepanagar (M.P.) S/S to proposed 132 KV Dharni S/S (Interstate Line) - 55.0 Kms.
- 3) 132 KV Line Bays - 2 Nos. (1 No. at 132 KV Dharni S/S & 1 No. at 220 KV Nepanagar (M.P.) S/S.
- 4) 33 KV Outlets - 6 Nos. (Outlets to be constructed as per requirement)

The above mentioned scope of work is not covered under any scheme or EPC contract.




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4.0 Design Criteria

The total infrastructure has been planned by adopting the following design criteria while formulating the scheme.

A. CEA Technical standards for sub – station & switchyards.

- 1.1 The maximum fault level on any new sub – station / switchyard bus should not exceed 80 % of the rated rupturing capacity of the circuit breaker. The 20 % margin is intended to take care of the increase in short circuit levels as the system grows. The rated breaking current capability of switchgear at different voltage levels may be taken as:]

Table – 1	
66 kV	25 / 31.5 kA (for 1 Sec.)
132 kV	25 / 31.5 kA (for 1 Sec.)
220 kV	31.5 / 40 kA (for 1 Sec.)
400 kV	40 / 50 kA (for 1 Sec.)
765 kV	40 / 63 kA (for 1 Sec.)

If fault level at 400 kV sub – station exceeds or likely to exceed permissible limit of 40 kA, with the addition of more generators & termination of new transmission lines, adequate measures to limit the fault level like installation of series reactors on line / bus at the respective sub – stations need to be considered for future transmission development.

- 1.2. The capacity of any sub – station / switchyard at different voltage levels shall not normally exceed:

Table – 2	
765 kV	4500 MVA
400 kV	1500 MVA
220 / 230 kV	500 MVA
132 / 110 / 100 kV	150 MVA
66 kV	75 MVA



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1.3 Size & number of interconnecting transformers (ICTs) shall be planned in such a way that the outage of any single unit would not over load the remaining ICTs or the underlying system.

1.4 The design & construction of the proposed installation shall facilitate future expansion & system up gradation including automation & computerized coordinated operation such as Supervisory Control & Data Acquisition System (SCADA) and Energy Management System.

2 Design Consideration for EHV Sub – stations & Switching Station

2.1. The choice of site for a substation / switch yard is compromise between technical, economic, environmental and administrative factors. The approximate location is determined on grid consideration. The new substation shall enhance the operational flexibility, system reliability and transmission capacity after becoming a part of the network.

2.2. Land area available shall be considered based on the present and the future expansion on a 10 – 15 years scenario.

2.3. Reactive compensation as indicated by system studies of the network is to be provided. The series compensation could be fixed / variable / combination of both (partly fixed & partly variable). Similarly some compensator could be either switched or non – switched type.

2.4. The selection of switching schemes depends on operational flexibility, system safety, reliability & availability, ability to facilitate system control & costs. The following switching schemes shall generally be adopted at different voltage levels in AIS depending on importance of installation.

Table – 3	
Main & Transfer Bus or Double Bus Scheme	66kV & 132kV
Double Main & Transfer Bus or Double Bus Scheme	220 kV




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2.5. In case of AIS, bus – bars shall be either of the grid type with tubular aluminium bus conductor or flexible stranded conductor with ACSR /AAAC/ any other suitable conductors. The conductor of appropriate rating & number of conductors in case of bundle conductors shall be selected considering power flow requirements & other system considerations. For the grid bus – bars arrangement, aluminium pipes of grade 63401 WP range 2 conforming to IS: 5082 shall be used.

2.6. Outdoor Air Insulated Sub – station / switchyard has to be shielded against Direct Lightning stroke either by provision of overhead shield wire / earth wire or spikes (masts) or combination of both.

B. Maharashtra State Grid Code criteria as per condition No. 9

3.1. The planning criterion shall be based on the security philosophy on which the InSTS has been planned. The security philosophy may be as per the Transmission Planning Criterion and other guidelines as given by the Authority.

Provided that STU shall carry out appropriate system studies while developing the transmission system plans.

3.2. The intra – State transmission system, as a general rule, shall be capable of withstanding & be secured against the following contingency outages without necessitating load shedding or rescheduling of generation during Steady State Operation:

- I. Outage of a 110 kV / 132 kV D/C line or,
- II. Outage of a 220 kV D/C line or,
- III. Outage of a 400 kV S/C line or,
- IV. Outage of a single Interconnected Transformer or,
- V. Outage of a one pole HVDC Bipole line or,
- VI. Outage of a 765 kV S/C line.




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Provided that the above contingencies shall be considered assuming a pre - contingency system depletion (planned outage) of another 220 kV D/C line or 400 kV S/C line in another corridor & not from the same substation

3.3. All the generating units may operate within their capability curves and the network voltage profile shall be maintained within voltage limits specified.

3.4. The intra - State transmission system shall be capable of withstanding the loss of most severe single in feed without loss of stability.

3.5. Any one of the events defined in the Regulation 9.2 above shall not cause:

- I. Loss of supply;
- II. Prolonged operation of the system frequency below & above specified limits;
- III. Unacceptable high or low voltage;
- IV. System instability;
- V. Unacceptable over loading of I_n STS elements.

3.6. In all substations (66 / 110 / 132 kV & above), except HVDC, suitable number & capacity of transformers shall be provided to have adequate redundancy required to maintain firm capacity at the substation. In HVDC substations, at least one spare converter / inverter transformer shall be kept ready to use at any time.

Explanation: - for the purpose of Regulation 9.6, the term firm capacity shall mean the minimum transformation capacity available at the substation in case of outage of any one transformer.

3.7. State Transmission Utility shall carry out planning studies for Reactive Power compensation of I_n STS including reactive power compensation at the in - State Generating Station's Switchyard.

Based upon the above guidelines, estimates have been prepared with addition of some useful inputs derived from the working experience of MSETCL Planning Section viz.

- a) For 220 kV & 132 kV level-2 bus system & minimum capacity proposed is 2x25 MVA.
- b) 33 kV level- Single bus system.


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- c) 6 KM DCMC line (3 km at each end) for DCDC lines.
 - d) 3 km DCMC line for LILO line.
 - e) 6 KM SCMC line (3 km at each end) for SCDC lines.
 - f) 3 km SCMC line for LILO line.
 - g) The bays for both ends of line are considered.
 - h) The cost of civil works is taken by considering urban land and agricultural land for 220kV and 132 kV Substations as the case may be.
 - i) The conductors used for all lines are 288 / 525 sq.mm. AAAC conductor.
4. Declared voltage of supply to consumer-

The voltage at the point of commencement of supply of Extra-high voltage shall not be more than 10 % on higher side or shall not be less than 12.5 % on lower side.


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5.0 a) Brief Scope of Work:

- 1) Establishment of 2x25 MVA, 132/33 KV Transformer with Bays.
- 2) Construction of 132 KV SCDC Line from 220 KV Nepanagar (M.P.) S/S to proposed 132 KV Dharni S/S (Interstate Line) - 55.0 Kms.
- 3) 132 KV Line Bays - 2 Nos. (1 No. at 132 KV Dharni S/S & 1 No. at 220 KV Nepanagar (M.P.) S/S)
- 4) 33 KV Outlets - 6 Nos. (Outlets to be constructed as per requirement)

Govt. land is identified and Land acquisition proposal is submitted to collector office, Amravati on 01.10.2011.

b) Objective:

To cater the future load demand due to load growth and to cope up with the low voltage problems with following benefits.

- 1) Load relief to existing 132 KV Hiwarkhed S/S.
- 2) To improve voltage profile in Dharni-Hiwarkhed pocket due to reduction in length of 33 KV feeders.
- 3) To cater future load in nearby area.
- 4) a) Voltage will improve from 0.91 KV P.U. to 0.92 KV P.U. at 132 KV Hiwarkhed S/S
b) The saving in Line losses will be 1.41 MW with considerable improvement in Bus voltages.




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6.0 Estimated Cost:

The total cost of scheme is worked out to be Rs. 3398.00 Lakhs (Including IDC component Rs. 165.00 Lakhs)

Cost data 2010-11 is considered while working out estimated cost of the scheme. Annexure A (I to VII)

7.0 Cash Flow

Sr. No.	Particulars	Budget Provision for the Year		Total Rs. in Lakhs
		2011-12	2012-13	
1	Base cost	2000.00	1233.00	3233.00
2	IDC	72.00	93.00	165.00
3	Total:	2072.00	1326.00	3398.00
4	Debt	1657.00	1061.00	2718.00
5	Equity	415.00	265.00	680.00
6	Budget provision	2072.00	1326.00	3398.00



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8.0 Funding Arrangement

The tentative expenditure prepared is as follows

Sr. No.	Year	Total in Rs. Lakhs
1.	2011-12	2072.00
2.	2012-13	1326.00
	Total	3398.00

1	Interest Rate	a)REC-11% b)PFC-11.12%
2	Moratorium Period	02 Years
3	Funding Institute	REC/PFC
4	Repayment Schedule	10 Years
5	Debt/Equity Ratio	80:20



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9.0 System study Report

Enclosed at end herewith.




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10.0 Detailed estimate, Single line diagram of SUBSTATION, Geographical showing proposed arrangement etc.

Enclosed at end herewith.




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11.0 Impact on Tariff

Enclosed herewith.




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IMPACT ON TARIFF**ESTABLISHMENT OF 132/33 KV DHARNI SUB-STATION, DIST.-
AMRAVATI**

Name of the Scheme :

Commissioning Year- 2011-12

Interest on borrowing

11.50%

Debt : Equity Ratio

80%

20%

Equity flowing equally

Rs. in Lakhs

Cost of the Scheme						3398.00
Description.	1	2	3	4	5	Total
Year	2011-12	2012-13	2013-14	2014-15	2015-16	
Base cost	2000	1233.0				3233.0
Borrowing	1600	986				2586
EQUITY	400	247				647
Total Interest	71.5	93.5				165.0
Interest on borrowing	57.2	74.8				132.0
Total borrowing	1657.2	1061.2				2718.4
Total equity	414.3	265.3				679.6
Total cash flow	2071.5	1326.5				3398.0
Base cost	3233.0		Borrowing	2718.4	80%	
IDC	165.0		EQUITY	679.6	20%	
Total	3398.0		Total	3398.0		
Expenses						
Return on equity @ 14 % per annum			95.14	0.00	0.00	
Interest on Loan (11.5 %)						
1600.00			184.00	184.00	174.80	
986.40			113.44	113.44	113.44	
0.00				0.00	0.00	
Depreciation(sheet attached)			98.07	98.06	98.06	
O & M Expenses @ 3% on Asset Commissioned.			101.94	101.94	101.94	
1 Income Tax (on Return on equity) @30%			28.54	0.00	0.00	
2 Contribution to contingency Reserves 0.5 % of Gross Fixed Asset at the beginning of the year			16.99	16.99	16.99	
Intrest on working Capital @ 11.5% on						
a)1/12 th of O&M Expe.			0.98	0.98	0.98	
3 Sub-Total			638.13	514.43	505.23	
4 b)1/12*1.5*Sub-Total.			9.17	7.39	7.26	
5 Total Expenses			647.30	521.82	512.49	
6 Million Units sent by MSETCL in Yr. 2006 -2007.(assuming rise of 5% per year for next 4 yaers)	76712.35	80547.97	84575.37	88804.13	93244.34	
Impact on Tariff in Rs. Per Unit			0.0007654	0.0005876	0.00054962	

Assumptions

1)Loan & Equity is flowing simultaneously in the given ratio.

2)Interest during construction (IDC) is to be capitalised till the date of commercial operation.

3)The capitalisation of the assets on commissioning is presumed to be done in the month of March of

4)The formula used for calculation of intrest on working capital is as follows

 $WC = 1/12 (O\&M \text{ Exp.}) + 1/12 (1.5 * \text{Sub-Total})$

5) MUs send by MSETCL are as per SLDC data and considering 5% rise per year

115



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ESTABLISHMENT OF 132/33 KV DHARNI SUB-STATION, DIST.- AMRAVATI

Depreciation

	Life	% Depre =90/ col.2	Base value	14.0725% loading for Cent. & Contin.	Total cost 4+5	Cost of the assets to be commissioned by 2011-12		Cost of the assets commissioned by 2012-13		11-12	12-13	13-14	14-15	15-16
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
						Asset cost	IDC loading	Asset cost	IDC loading					
Civil works														
Land + Development			145	20.405	165.405	165.41	8.44	165.41	8.44			0	0	0
Buildings & Quarters	50	1.8	175	24.627	199.627	199.66	10.19	199.63	10.19			3.78	3.78	3.78
Electrification	15	6	4.88	0.687	5.567	5.57	0.28	5.57	0.28			0.35	0.35	0.35
Transmission Line	35	2.57	1474.81	207.543	1682.353	1682.62	85.87	1682.35	85.87			45.48	45.47	45.47
Sub-station works	603.36													
Battery Set	5	18	2.95	0.415	3.365	3.37	0.17	3.37	0.17			0.64	0.64	0.64
Other equipments.	25	3.6	600.41	84.493	684.903	685.01	34.96	684.90	34.96			25.92	25.92	25.92
Outlets	25	3.6	315.24	44.362	359.602	359.66	18.36	359.60	18.36			13.61	13.61	13.61
PLCC equipments	15	6	115.44	16.245	131.685	131.71	6.72	131.69	6.72			8.31	8.30	8.30
			2833.73	398.78	3232.51	3233.00	165.00	3232.51	165.00			98.07	98.06	98.06
						3233	165.00		165.00					

Cost of the
Scheme :

3398

MF

1.000161

0.051

0.05

Assumption:

Depreciation is calculated using Straight line method assuming Salvage value of 10%, as per MERC guidelines

Depreciation =(Equipment cost-salvage value)/Life of equipment



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12. If not Analysis

If this scheme is not considered for implementation; the following adversities are to be faced:-

- a) Future load cannot be catered in nearby area.
- b) There will not be improvement in voltage profile in Dharni-Hiwarkhed pocket.

13. If Deferred Analysis

It would result into:

- a) Increase in line loss due to additional demand in future.
- b) ROW problem may come across in future.
- c) Cost escalation in future may affect the scheme.

14.0 Justification for the scheme

- a) Proposed s/s will give reliability in supply and to cope up future load demand in that area.
- b) Voltage will improve from 0.91 KV P.U. to 0.92 KV P.U. at 132 KV Hiwarkhed S/S
- c) The saving in Line losses will be 1.41 MW with considerable improvement in Bus voltages
- d) Voltage level at 33kV level will be improved.
- e) 33 kv feeder length will be reduced; which will reduce area affected during faults on 33kv lines.




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15.0 Alternative If Any:

As per circumstances stated in preamble and justifications there is no other technical and practical alternative than Establishment of 2 x 25 MVA, 132/33 KV : station at Dharni, Dist. – Amravati

16.0 Implementation And Monitoring:

It is proposed to get the scheme implemented through Turn-key or EPC contract supervision of MSETCL.

1. The work is expected to be completed by March 2013.
2. The probable year of completion of assets is 2013-14.




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A B S T R A C T

COST ESTIMATE OF ESTABLISHMENT OF 132/33 KV DHARNI SUB-STATION, DIST.- AMARAVATI			
SR. NO.	PARTICULARS	AMOUNT IN RS. LAKHS	REMARKS
1	CIVIL WORKS	324.88	ANNEXURE-I
2	TRANSMISSION LINE	1474.81	ANNEXURE-II
3	2 x 25 MVA ,132/33 KV POWER TRANSFORMER ALONGWITH BAYS	589.36	ANNEXURE-III
4	132 KV BAYS- 2 NOS.@ RS. 90.42 LAKHS/ BAY	180.84	ANNEXURE-IV
5	PLCC EQUIPMENTS	45.44	ANNEXURE-V
6	SCADA SYSTEM	70.00	ANNEXURE-VI
7	33 KV OUTLETS @ RS. 22.40 LAKHS/OUTLET (6 NOS.)	134.40	ANNEXURE-VII
8	132 KV BUS BAR PROTECTION	14.00	
	SUB TOTAL - I	2833.73	
9	ADD.CONTINGENCIES 3% ON SUB TOTAL - I	85.01	
	SUB TOTAL - II	2918.74	
10.	ADD.CENTAGES 10.75% ON SUB TOTAL-II	313.76	
	SUB TOTAL - III	3232.51	
	IDC COMPONENT	165.00	ANNEXURE-A
	GRAND TOTAL	3397.51	
	SAY RS. 3398.00 LAKHS		
THE ESTIMATES ARE PREPARED BY APPLYING RATES OF LATEST COST DATA AND THE CALCULATION ARE CORRECT.			

119




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