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## **1 BACKGROUND**

The Maharashtra State Electricity Distribution Company Limited (MSEDCL or Maha Vitaran) is a Company formed under the Government of Maharashtra General Resolution No. ELA-1003/P.K.8588/Bhag-2/Urja-5 Dated January 24, 2005 with effect from 6<sup>th</sup> June 2005 according to the provisions envisaged in the Electricity Act 2003. The MSEDCL has been registered with the Registrar of Companies, Mumbai on 31<sup>st</sup> May 2005 bearing certificate U40109 MH 2005 PLC 153645 under the Companies Act, 1956.

The Maharashtra State Electricity Distribution Company Limited (MSEDCL or Maha Vitaran) is submitting this Annual Revenue Requirement (ARR) & Tariff Petition for FY 2006-07, on the basis of the provisional Transfer Scheme, in accordance with Sections 61, 62 and 64 of the Electricity Act 2003 (EA 2003) and as per the MERC (Terms and Conditions of Tariff) Regulations, 2005, based on the actual expenditure and revenue of FY 2004-05, actual expenditure till September 2005 and estimates from October onwards for FY 2005-06, and projections for FY 2006-07.

The previous submission to the Hon'ble Commission was made by the erstwhile Maharashtra State Electricity Board (MSEB), on April 7, 2003, for the revision of its Retail Distribution Tariff with effect from April 1<sup>st</sup> 2003. The Hon'ble Commission, after due deliberations, had issued a detailed Tariff Order corresponding to the aforementioned submission on March 10<sup>th</sup> 2004 (operative Order issued on December 1, 2003).

As the Hon'ble Commission is aware, considerable time has passed since the filing of the last ARR Petition by the integrated MSEB, the issue of the Tariff Order by the Hon'ble Commission and the present submission being made by MSEDCL.

MSEDCL would like to draw the attention of the Hon'ble Commission to some of changes that have taken place since the previous submission by the erstwhile MSEB –

- a) Increased understanding of the provisions of the Electricity Act 2003, with a number of State Electricity Regulatory Commission's (SERC's) notifying new Regulations as per the provisions of the Electricity Act 2003.
- b) Unbundling of the erstwhile Maharashtra State Electricity Board (MSEB) into its successor Companies – the MSEB Holding Company Limited (MSEB-HCL), Maharashtra State Power Generation Company Limited (MSPGCL or Maha GENCO), Maharashtra State Electricity Transmission Company Limited

(MSETCL or Maha TRANSCO) and the Petitioner, Maharashtra State Electricity Distribution Company Limited (MSEDCL or Maha Vitaran).

- c) Severe peak and off-peak shortage of power in the State of Maharashtra and the significant amount of load shedding being undertaken by MSEDCL, as per the principles and protocol for load shedding as specified by the Hon'ble Commission.

### **1.1 Provisional Transfer Scheme**

As per Section 131 of the EA; any property, interest in property, rights and liabilities belonging to the State Electricity Board are to vest with the State Government and such property, interest in property, rights and liabilities are further to be reinvested by the State Government in a Government Company, Government companies or its subsidiaries as stipulated in the Transfer Scheme. MSEDCL would like to draw attention of the Hon'ble Commission that such a provisional Transfer Scheme has been notified under 131 (5) (g) of the EA 2003 on 6<sup>th</sup> June 2005, which has resulted in the creation of 4 successor Companies including the petitioner. MSEDCL would like to bring to the kind notice of the Hon'ble Commission that this submission is being made in accordance with the provisional Transfer Scheme. For years prior to FY 2005-06, i.e., the year of the Transfer Scheme, the expenses of MSEDCL has been segregated from the books of the integrated MSEB on the basis of Trial balances available for the previous years.

The main functions of MSEDCL as outlined in Transfer Scheme are as follows-

- a) To acquire, establish, construct, take over, erect, lay, operate, run, manage, hire, lease, buy, sell, maintain, enlarge, alter, renovate, modernize, work and use projects associated lines and all things connected thereto for the purpose of distribution of power including sub-station, civil works distribution centres, cables, wires, lines, accumulators, plant, motors, meters, apparatus, materials and things , connected with the production, generation, use, storage, measurement. ;and distribution lines (LT and HT 11/22/33 kV) connected therewith.
- b) To carry on the business of purchasing, importing, exporting, trading or otherwise dealing in Electric Power and to coordinate, aid and advise on the activities of other companies and concerns including subsidiaries, associates, affiliates engaged in the generation, distribution or trading of power on all matters concerning the operation and maintenance of Electric sub-stations,

associated lines (LT and HT 11/22/33 kV) and in the use, storage and measurement, distribution and supply of electric power.

- c) To acquire, establish, construct, take over, erect, lay, operate, run, manage, hire, lease, buy, sell, maintain, enlarge, alter, renovate, modernize, work and use electrical distribution lines and/or net work through, high voltage (11/22/33 kV) and low voltage line and associated sub-stations, including distribution centres, cables, wires, accumulators plants, motors, meters, apparatus, computers and materials connected with distribution, ancillary services, supply of electrical energy, SCADA and AMR systems, telecommunication and telemetering equipment in the State of Maharashtra and elsewhere. To undertake, for and on behalf of others the erection, operation, maintenance, management of high voltage (11/22/33 kV) and low voltage lines and associated substations, equipment, apparatus, cables, wires.

As a result of the provisional Transfer Scheme, the following asset classes have been transferred from the erstwhile MSEB to MSEDCL. A detailed list of assets transferred to MSEDCL has been provided in **Annexure X**.

All the Assets, Liabilities and proceedings, including the following but not limited them, belonging to the Board, concerning the distribution of electricity in the area of supply consisting of O & M Zones of Amravati, Aurangabad, Beed-latur, Bhandup, Kalyan, Konkan, Kolhapur, Nagpur, Nagpur (Urban), Nashik and Pune in the State of Maharashtra.

**I. Distribution Assets:**

All 33 kV, 22 kV, 11 kV, LT. (Single phase 2 wire to 3 phase 5 wire) lines (with overhead lines, Aerial Bunched cables on different types of supports and underground cables) with various sizes of conductors and 33 kV Sub-stations and step up/step down power transformers and distribution transformers, breakers, capacitor banks, protective and metering devices and control rooms, boosters, wireless systems, testing laboratories, SCADA and AMR systems, lands (including right of way), buildings, roads, diesel generating sets or other conventional and non-conventional generating units, service connections and installations inside consumer's premises, street lighting and signal systems owned by or leased to the Board but excluding fittings, fixtures and installations owned, by private persons or local authorities, including any of the above assets under construction as on effective date of

transfer.

## II. General Assets:

The following, if they exclusively or primarily pertain to the above mentioned distribution systems, properties or projects or activities related to such distribution systems, properties or projects:

- a. Special tools and equipment, material handling equipment, earth movers, bulldozers, concrete mixtures, cranes, trailers, heavy and light vehicles, furniture, fixtures, office equipment, air conditioners, compressors, refrigerators, computers and signal systems, spares, consumable raw materials, lands and civil works installations including roads, buildings, staff quarters, rest houses, properties and structures - and their associated buildings, schools, dispensaries, testing laboratories and equipment, training centres, workshops, works in progress, machinery and equipment sent for repairs, scraps and obsolete.
- b. All independent and stand-alone Rest houses, which are not part of any substations/installations of the Board.
- c. The office establishment, buildings, lands and all other assets not covered elsewhere in this schedule, which are predominantly occupied/used for the activities of Distribution Undertakings as on the effective date of transfer.

## III. Miscellaneous:

- a. Contracts, agreements, interest and arrangements to the extent they are associated with or related to distribution activities
- b. Contingent liabilities to the extent they are recognized and are associated with or related to distribution activities.

## 1.2 Distribution network of MSEDCL

MSEDCL has the following distribution network in the State of Maharashtra:

Particulars	Numbers
33 kV Substations	1563
22 kV Substations	57
Switching stations - 22kV or 11kV	86
Power transformers	1900

Particulars	Numbers
33 kV line(km)	25620
HT line (km) (22kV or 11 kV)	185597
LT line(km)	392809
DTCs 22/0.4 kV	25080
DTCs 11/0.4 kV	183253
DTCs Capacity (MVA)	16890

### 1.3 Capital Expenditure Programme of MSEDCL

MSEDCL has prepared a sub-division wise Infrastructure Work Plan to improve efficiencies in its distribution system, which was presented to the Commission on June 22, 2006. The Infrastructure Work Plan has been prepared over a three-year time horizon (FY 2006-07 to FY 2008-09) and totals approximately Rs 14,524 Crore comprising of capital expenditure and O&M works. The details and justification for the respective schemes/works have been submitted/are being submitted to the Hon'ble Commission separately.

In addition, MSEDCL has also initiated the process of agricultural feeder separation, and is also continuing with the Single Phasing investment. Details of these schemes have been provided in the Chapter on Capital Expenditure in the Petition.

### 1.4 Reasons for Delay in Filing

The original date for submission of the ARR Petition, as per the MERC (Terms and Conditions of Tariff) Regulations, 2005, was November 30, 2005, which has been extended by the Hon'ble Commission, based on the request made by MSEDCL and other Utilities. As brought out above, there have been a number of changes in the power scenario in Maharashtra over the past 3-4 years. MSEDCL would like to submit the following -

1. The reorganisation of MSEDCL is a vast and time-consuming exercise involving a multiplicity of agencies including GoM, MSEDCL Officials, consultants and other stake holders. MSEDCL began the process of segregation quite some time back, and the Hon'ble Commission will appreciate the time and effort that has gone into the restructuring exercise and drafting of the provisional Transfer Scheme.

2. The transfer of officers to the successor Companies is even now being undertaken and this has resulted in the delay in preparation of the Accounts for the separate Companies.
3. This is the first time that a separate Petition is being filed separately for the distribution and supply function, which was not separately identified earlier.
4. The Companies have all been grappling with the severe load shedding being undertaken in the State, being an immediate and primary concern and more resources have been concentrated on mitigating the load shedding and minimising the occurrences of EHV opening.

MSEDCL submitted the ARR Petition on 28<sup>th</sup> February 2006, on which the preliminary validation was held by the Commission on 7<sup>th</sup> April 2006. The Tariff Proposal was submitted on 26<sup>th</sup> May 2006, on which the final Technical Validation session was held on 22<sup>nd</sup> June 2006. Considering the changes subsequent to filing of ARR & Tariff Petition and also the discussion during the Technical Validation sessions, the ARR and Tariff Petitions have been merged into one single document, which is being submitted now.

Hence, MSEDCL requests the Hon'ble Commission to condone the delay in filing of the ARR and Tariff Petition, and requests the Hon'ble Commission to accept the Petition and process the Petition expeditiously.

## **2 ENERGY INPUT REQUIREMENT**

MSEDCL's Energy Input Requirement is the summation of the category-wise sales and the distribution losses prevailing in the MSEDCL system. In this Section, MSEDCL has detailed the actual and projected category-wise sales, the results of the energy audits undertaken at different levels, the overall distribution losses in the State, the trajectory of improvement projected in the distribution losses, and the net energy input requirement for the MSEDCL system.

### **2.1 Sales Projections**

The consumer categories, sub-categories and the consumption slabs have been considered on the basis of the Hon'ble Commission's prevailing Tariff Order, issued on December 1, 2003.

Sales to all the consumers, except a part of the LT agricultural consumer category, is metered, and MSEDCL has projected the category-wise sales for these metered categories on the basis of the past trends in sales, using 5-year or 3-year Compounded Annual Growth Rate (CAGR) as appropriate, and after considering the assessed impact of the severe load shedding being presently undertaken by MSEDCL in the State.

The monthly sales pattern for each consumer category has been projected on the basis of the monthly sales trend in FY 2004-05, and has been given in Form 10 of Annexure 1. The sub-category wise and consumption slab-wise sales for FY 2005-06 and FY 2006-07, have been projected on the basis of the actual share of each sub-category and consumption slab in FY 2004-05.

The sales to un-metered categories (a portion of LT agricultural category) has been projected on the basis of the agricultural consumption norm derived on the basis of the energy audit data and appropriate filters as discussed in subsequent paragraphs on energy audit of agricultural feeders.

#### **2.1.1 HT category**

The past trend in sales to the HT category is given in the Table below (details given in Form 10 of Annexure 1).

(MU)

Sl.	Consumer Category & Consumption Slab	FY00	FY01	FY02	FY03	FY04	FY05	5 Year CAGR
<b>A HT Category</b>								
1	HTP Industrial	13026	12409	12070	12549	13731	15453	3%
1.1	HTP-I (HT Industrial - BMR/PMR)	6455	6556	6197	6482	6183	4237	-8%
1.2	HTP-II (HT Industrial - non BMR/PMR)	6571	5853	5867	6032	7508	11155	11%
1.3	HT Industrial - Seasonal			6.3	34.1	40.6	62	
2	HTP-III (HT Water Works - BMR/PMR)	576	557	573	607	614	610	1%
3	HTP-IV (HT Water Works - non BMR/PMR)	317	324	322	376	423	482	9%
4	HTP-V (Railway Traction)	809	817	863	934	992	1068	6%
5	HTP-VI (Bulk Supply)	218	253	268	292	326	336	9%
	Residential Complex	214	236	251	276	309	318	8%
	Commercial Complex	4	17	17	16	17	19	35%
6	HTP-VII (HT Agriculture)	497	714	643	552	453	418	-3%
7	Tata Power Company		0	0	0	33	54	
8	Mula Pravara Electricity Co-operative Society (MPECS)	557	623	605	631	609	552	0%
9	Inter-State sales	650	176	28	18	9	0	-77%
	<b>TOTAL HT Category</b>	<b>16651</b>	<b>15872</b>	<b>15372</b>	<b>15959</b>	<b>17191</b>	<b>18974</b>	<b>3%</b>

The sales projections for HT category have been done mainly on the basis of the past trends (5-year CAGR) for most categories, and after accounting for the projected energy available in FY 2006-07, as shown in the Table below:

(MU)

Sl.	Consumer Category & Consumption Slab	Previous Year (FY 2004-05)	Growth over previous year	Current Year (FY 2005-06)	Growth over previous year	Ensuing Year (FY 2006-07)
		(Actual)	(%)	(Estimates)	(%)	(Forecast)
<b>A HT Category</b>						
1	HTP-I (HT Industrial - BMR/PMR)	4237.08	3.5%	4384.35	8.6%	4760.74
2	HTP-II (HT Industrial - non BMR/PMR)	11154.52	3.5%	11542.21	8.6%	12533.11
2.1	HT Industrial - Seasonal	61.52	3.5%	63.66	8.6%	69.12
3	HTP-III (HT Water Works - BMR/PMR)	610.29	0.0%	610.29	1.0%	616.40
4	HTP-IV (HT Water Works - non BMR/PMR)	481.88	14.4%	551.18	15.9%	638.73
5	HTP-V (Railway Traction)	1067.75	7.4%	1146.28	8.0%	1238.03
6	HTP-VI (Bulk Supply)	336.25	7.9%	362.76	7.9%	391.41
6.1	Residential Complex	317.69	8.2%	343.65	8.2%	371.73
6.2	Commercial Complex	18.56	3.0%	19.11	3.0%	19.68
7	HTP-VII (HT Agriculture)	418.14	8.0%	451.59	20.0%	541.91
8	Tata Power Company	54.46		0.00		0.00
9	Mula Pravara Electricity Co-operative Society (MPECS)	551.56	8.0%	595.68	8.0%	643.34
10	Inter-State sales	0.39		0.00		0.00
	<b>TOTAL HT Category</b>	<b>18973.84</b>	<b>3.9%</b>	<b>19708.02</b>	<b>8.8%</b>	<b>21432.79</b>

Thus, the sales to the HT category have been projected as 19708 MU and 21432.8 MU in FY 2005-06 and FY 2006-07, respectively. It should be noted that MSEDCL has not considered the impact of the load regulation measures introduced by the Hon'ble Commission for HT industrial consumers, wherein these consumers have to reduce

their consumption to 80%/90% of their average consumption during the past year. This measure is expected to adversely affect the sales to the HT industrial category.

### 2.1.2 LT category

The past trend in sales to the LT category is given in the Table below (details given in Form 10 of Annexure 1).

(MU)

Sl.	Consumer Category & Consumption Slab	FY00	FY01	FY02	FY03	FY04	FY05	5 Year CAGR
<b>B</b>	<b>LT Category</b>							
10	Domestic (LD 1)	6427	6587	6925	7135	7328	7359	3%
11	Non Domestic (LD 2)	1308	1349	1493	1599	1764	1922	8%
12	General Motive Power (LTP-G)	3636	3036	3207	3036	3364	3793	1%
13	Public Water Supply							
	Urban P. W Schemes	63	36	43	34	31	31	
	Rural P. W Schemes	607	534	535	439	363	353	
	Sub Total PWW	670	571	577	473	394	385	
14	Agriculture							
	Flat Rate Tariff (Rs/HP/month)	9553	7282	8611	9014	8554	8636	
	Metered Tariff	208	230	387	604	849	1350	45%
	Sub Total Agriculture	9760	7512	8998	9618	9403	9985	
15	Street Light	257	383	494	520	541	539	16%
16	Temporary Connections	3	7	9	11	19	25	54%
	<b>TOTAL LT CATEGORY</b>	<b>22062</b>	<b>19444</b>	<b>21703</b>	<b>22392</b>	<b>22812</b>	<b>24008</b>	<b>2%</b>

In LT category, the incidence of load shedding is higher, which has had an impact on the sales to the LT categories. Hence, in the projections, MSEDCL has not used 5 yr CAGR for all categories, and has used its best judgement to project the category-wise sales for FY 2005-06 and FY 2006-07. In FY 2006-07, due to the addition of generation capacity in the form of RGPPL, Paras and Parli stations, the quantum of energy available for sale is expected to increase significantly in FY 2006-07 over FY 2005-06 levels. Accordingly, MSEDCL has assumed that the growth in sales to LT categories will be higher than the CAGR of sales exhibited in recent years, as the suppressed demand due to load shedding can be serviced.

Currently, the load shedding in agriculture-dominated areas is around 12 hours. The agriculture load has shifted to a large extent, and the consumption norm is expected to increase significantly in FY 2006-07, as the suppressed demand will be met through the additional energy availability. Accordingly, MSEDCL has assumed that the consumption norm of LT un-metered agricultural category will increase from

1602 hours/HP/annum in FY 2004-05 to 1762 hours/HP/annum and around 2290 hours/HP/annum in FY 2005-06 and FY 2006-07, respectively.

It may be noted that once all the additional power planned for FY 2006-07 comes on line, MSEDCL will still have a shortfall in terms of MW and may have to undertake load shedding during peak hours, though at lower levels. However, in energy (MU) terms, MSEDCL expects to be comfortably placed and hence expects the category-wise sales to increase, as shown in the Table below:

(MU)

Sl.	Consumer Category & Consumption Slab	Previous Year (FY 2004-05)	Growth over previous year	Current Year (FY 2005-06)	Growth over previous year	Ensuing Year (FY 2006-07)
		(Actual)	(%)	(Estimates)	(%)	(Forecast)
<b>B</b>	<b>LT Category</b>					
1	Domestic (LD 1)	7356.36	6.4%	7828.79	14.3%	8947.93
2	Non Domestic (LD 2)	1922.07	6.8%	2053.15	11.0%	2278.90
3	General Motive Power (LTP-G)	3792.39	6.1%	4022.83	12.7%	4534.05
4	Public Water Supply					
	Urban P. W Schemes	31.33	0.0%	31.33	0.0%	31.33
	Rural P. W Schemes	353.45	6.0%	374.66	22.0%	457.09
	Sub Total PWW	384.78	5.5%	405.99	20.3%	488.41
5	Agriculture					
	Flat Rate Tariff (Rs/HP/month)	8609.28		9499.22		12348.99
	Metered Tariff	1345.32		1854.49		2619.41
	Sub Total Agriculture	9954.60		11353.71		14968.40
6	Street Light	539.41	3.5%	558.50	3.6%	578.33
7	Temporary Connections	24.96	0.0%	24.96	0.0%	24.96
	<b>TOTAL LT CATEGORY</b>	<b>23974.56</b>	<b>9.5%</b>	<b>26247.92</b>	<b>21.2%</b>	<b>31820.98</b>
<b>C</b>	<b>Total MSEDCL</b>	<b>42948.41</b>	<b>7.0%</b>	<b>45955.94</b>	<b>15.9%</b>	<b>53253.77</b>

### 2.1.3 Total sales

The total sales projections have been summarised in the Table below:

(MU)

Sl.	Consumer Category & Consumption Slab	Previous Year (FY 2004-05)	Growth over previous year	Current Year (FY 2005-06)	Growth over previous year	Ensuing Year (FY 2006-07)
		(Actual)	(%)	(Estimates)	(%)	(Forecast)
A	TOTAL HT Category	18973.84	3.9%	19708.02	8.8%	21432.79
B	TOTAL LT CATEGORY	23974.56	9.5%	26247.92	21.2%	31820.98
<b>C</b>	<b>Total MSEDCL</b>	<b>42948.41</b>	<b>7.0%</b>	<b>45955.94</b>	<b>15.9%</b>	<b>53253.77</b>

## **2.2 Analysis of Energy Audit**

The erstwhile MSEB has been submitting the analysis of the energy audit conducted by it to the Commission in each ARR Petition.

In this Petition as well, MSEDCL is submitting its analysis of energy audit data for FY 2003-04 and FY 2004-05 for the following four categories depending on the voltage level and the category of consumers –

1. LT - Agricultural Feeders
2. MIDC Feeders
3. Express Feeders
4. Division level feeders

### **2.2.1 Agricultural Feeders**

MSEDCL has around 22.9 lakh agricultural consumers, of which around 17.5 lakh are un-metered. All new connections are released on metered basis only. MSEDCL is submitting Energy Audit data and analysis to assist the Hon'ble Commission in determination of the Agricultural consumption norm for the purpose of ascertaining the consumption in this category.

The objective of the energy audit analysis was –

1. To evaluate the circle wise/zone wise consumption norm (in hours/HP/Annum) and estimate the LT - Agriculture (Unmetered) consumption.
2. To understand the zonal, circle-wise, division wise variation (if any) and explore the possibility of fixation of a zonal norm instead of a single norm for the State as a whole.

#### **2.2.1.1 Sampling Characteristics**

MSEDCL has analysed the Energy Audit data for FY 2003-04 and FY 2004-05. The Hon'ble Commission will appreciate that the data for this exercise is voluminous and MSEDCL requests the Hon'ble Commission to submit revisions/additions/modifications to any of the data/analysis at a later date.

In the previous ARR Petition submitted in April 2003, the erstwhile MSEB had submitted data for a sample size of 4668 LT- Agricultural feeders covering six (6)

zones and twenty-five circles. The Hon'ble Commission would be glad to note that the sample size has increased to 6137 in FY 2003-04 and further to 6608 in FY 2004-05.

The Zones included in the analysis are as follows - Amravati, Aurangabad, Beed/Latur, Kolhapur, Nasik, Nagpur, Nagpur (U) and Pune. The Hon'ble Commission is informed that two additional zones have been included in the analysis for FY 2003-04 and FY 2004-05. The following Zones have not been sampled owing to their relatively low agricultural consumption - Bhandup, Kalyan, and Konkan. However, the Hon'ble Commission may note that these zones represent less than 1-3% of the total Connected Load in the Agricultural segment and hence the impact of their exclusion on the authenticity of the overall sample data is negligible.

The Hon'ble Commission on Pg. 143 of its Tariff Order dated March 10<sup>th</sup> 2004 has mentioned that that sampling coverage across zones/circles is non-random and does not represent a statistical random sample. In this connection, MSEDCL would like to state that it has appointed the services of a Consultant to assist MSEDCL in determining the appropriate sampling criteria. The Report on the proposed methodology would be submitted to the Hon'ble Commission soon. Briefly, the proposed methodology involves using the stratified random sampling technique wherein the population would be divided into non-overlapping groups on the basis of their connected load. The proposed methodology is expected to be implemented shortly. An analysis of the sampling coverage across circles is brought out below.

**Table - Sampling Categorization for FY 2003-04**

Coverage	Total	Circles
<1%	4	Parbhani, Jalna, Beed, Ahmednagar
1%-3%	12	Buldhana, Aurangabad, Solapur, Sangli, Osmanabad, Nanded, Latur, Bhandara, Nasik, Jalgaon, Dhule, Pune (R)
3%-5%	2	Yavatmal, Akola
5%-7%	3	Amravati, Satara, Kolhapur
7%-10%	2	Nagpur (R), Chandrapur
>10%	2	Wardha, Gadchiroli
Grand Total	25	

**Table - Sampling Categorization for FY 2004-05**

<b>2.2.1.2 Coverage</b>	<b>Total</b>	<b>Circles</b>
<1%	4	Jalna, Beed, Solapur, Ahmednagar
1%-3%	11	Aurangabad, Parbhani, Osmanabad, Nanded, Latur, Sangli, Bhandara, Dhule, Jalgaon, Nasik, Pune (R)
3%-5%	3	Akola, Buldhana, Amravati
5%-7%	3	Yavatmal, Kolhapur, Satara
7%-10%	4	Nagpur (R), Wardha, Chandrapur, Gadchiroli
<b>Grand Total</b>	<b>25</b>	

As can be seen from the above tables, there has been an improvement in the sampling coverage with a number of circles shifting from the lower level of coverage to a higher range.

### **2.2.1.3 Filtering Criterion**

As mentioned above, the quantum of data used in the agricultural feeders analysis is voluminous. The total number of readings for the entire data set for one Financial Year is close to 60,000. Hence it is imperative to filter out data points that represent errors in readings, operational problem with the meter, etc. so as to remove any bias in the output. Simultaneously, certain filters need to be applied to ensure consistency of the data.

MSEDCL has continued with the filtering criterion adopted by the Hon'ble Commission in its previous Tariff Order, of at least 300 days per year. The table below gives the qualified readings exceeding 300 days of monitoring. It may be seen that the number of total readings has increased to 4089 readings up from only 1772 in FY 2001-02 and 3770 in FY 2002-03, representing a jump of 8.46%. The table also shows that considering a range of 300-3000 hours of operation as opposed to 300-3600 hours excludes as much as 5% of the readings from the analysis. Hence, MSEDCL firmly believes that there is a strong justification for usage of 3600 hours of operation as the appropriate filter, as opposed to 3000 hours as considered by the Hon'ble Commission.

**Table: Shortlisted Feeder Readings FY 2003-04**

Category (Hours/Year)	Amravati	Aur' bad	Latur	Kolhapur	Nagpur (R)	Nagpur	Nasik	Pune	Total
1:<300	100	16	73	217	69	260	54	45	834
2:300-600	110	35	69	205	83	140	59	17	718
3:600-1200	226	90	103	383	98	125	163	53	1241
4:1200-1800	197	81	108	284	31	59	230	44	1034
5:1800-2400	111	44	62	198	26	23	233	30	727
6:2400-3000	70	42	62	135	16	5	190	15	535
7:3000-3600	31	24	22	95	5	2	145	13	337
8:>3600	70	51	29	183	17	16	296	49	711
Total Readings	915	383	528	1700	345	630	1370	266	6137
300-3600	745	316	426	1300	259	354	1020	172	4592
Percentage	81%	83%	81%	76%	75%	56%	74%	65%	75%

**Table: Shortlisted Feeder Readings FY 2004-05**

Category (Hours/Year)	Amravati	Aur'bad	Latur	Kolhapur	Nagpur(R)	Nagpur	Nasik	Pune	Total
1:<300	136	19	85	197	86	279	63	33	898
2:300-600	95	24	52	242	65	108	58	39	683
3:600-1200	207	75	135	492	69	113	178	59	1328
4:1200-1800	167	92	90	322	52	49	262	47	1081
5:1800-2400	131	58	70	202	33	28	274	29	825
6:2400-3000	86	29	40	117	22	15	269	22	600
7:3000-3600	51	17	17	72	12	9	172	11	361
8:>3600	66	54	20	183	22	29	400	58	832
Total Readings	939	368	509	1827	361	630	1676	298	6608
300-3600	737	295	404	1447	253	322	1213	207	4878
Percentage	78%	80%	79%	79%	70%	51%	72%	69%	74%

#### 2.2.1.4 Results

MSEDCL has analysed the agricultural data for FY 2003-04 and FY 2004-05 with the objective of arriving at the circle wise norm for agricultural consumption. In Page 141 of the Tariff Order dated March 10<sup>th</sup> 2004, the Hon'ble Commission has drawn attention to a certain anomaly in the computation of the State-wide norm on the basis of Connected Load of the Sample.

According to the Hon'ble Commission, since the sampling of the circles is non-uniform, the overall norm of the State would get influenced by those circles having higher representation in the sample. In order to overcome this anomaly, the Hon'ble Commission had used the total connected load of the circle for computing the zonal average norm. MSEDCL has adopted this methodology of the Hon'ble Commission and computed the norm on the basis of the total connected load of the circle for the years FY 2003-04 and FY 2004-05.

The findings are presented as under.

Zone	Commission's Assessment		MSEDCL's Estimate*	
	FY 01-02	FY 02-03	FY 03-04	FY 04-05
Amravati	1160	1184	1382	1483
Aurangabad (Incl. Aurangabad (U))	1385	1536	1489	1552
Beed,Latur	1366	1498	1409	1416
Kolhapur	1267	1355	1413	1397
Nagpur (R)			979	1273
Nagpur	902	1039	928	1141
Nasik	1318	1618	1941	2034
Pune (Includes Pune (R) but not Rastapeth & Ganeshkhind)			1427	1314
Others	737	871	928	1141+
<b>Grand Total</b>	<b>1290</b>	<b>1455</b>	<b>1559</b>	<b>1602</b>

\*: Computed on the basis of Connected Load of the embedded circles. Readings  $\geq$  300 Days have been considered and the norm of 300 hours - 3600 hours has been adopted.

+: Other Zones here include Kalyan, Bhandup and Konkan. For these zones, the minimum zonal norm for the respective year has been considered.

From the above table, it can be seen that the overall norm of the State works out to 1559 hours/HP/Annum for FY 2003-04 and 1602 hours/HP/Annum for FY 2004-05.

## 2.2.2 Express Feeders

### 2.2.2.1 Sampling characteristics

MSEDCL has analysed the Energy Audit data for Express Feeders for FY 2003-04 and FY 2004-05. MSEDCL has submitted Energy Audit data corresponding to 199 and 181 express feeders for FY 2003-04 and FY 2004-05 respectively, covering 11 zones and 35 circles. The zones covered are Amravati, Aurangabad, Beed, Bhandup, Kalyan, Kolhapur, Konkan, Nagpur, Nagpur-Urban, Nashik and Pune. The information provided includes zone name, circle name, Industrial consumer sub-station name, Consumption recorded at substation and billed energy at consumer end for each month. Based on the above information, the loss for the particular feeder for each month has been reported. The feeders covered under the study catered only to HT industrial load.

The Zone/Circle-wise coverage of feeders is shown in table below

**Table : Zone/Circle-wise coverage of Express feeders**

Sl.	Zone	Circle	No of Feeders	
			FY 2003-04	FY 2004-05
1	Konkan	Sindhudurg	2	1
2		Ratnagiri	1	1
	Zone Total		<b>3</b>	<b>2</b>
3	Bhandup	Vashi	6	5
4		RS & T Bhandup	2	2
5		Bhiwandi	4	3
	Zone Total		<b>12</b>	<b>10</b>
6	Kalyan	Kalyan	4	4
7		Pen	18	17
8		Vasai	1	1
	Zone Total		<b>23</b>	<b>22</b>
9	Nashik	Nashik	13	12
10		A'Nagar	9	8
11		Jalgaon	5	3
12		Dhule	11	9
	Zone Total		<b>38</b>	<b>32</b>
13	Kolhapur	Kolhapur	11	8
14		Sangli	6	3
15		Solapur	4	3
16		Satara	3	2
	Zone Total		<b>24</b>	<b>16</b>
17	Pune	Ganeshkhind( U) / (Pune U)	23	16
18		Rasta Peth (U) / Pune (U)		6
19		Pune (R)	7	6
	Zone Total		<b>30</b>	<b>28</b>
20	Nagpur	Chandrapur	15	14
21		Gadchiroli	2	2
22		Wardha	8	9
23		Nagpur(R)	15	
24		Bhandara	5	3
	Zone Total		<b>45</b>	<b>28</b>
25	Beed / Latur	Nanded	3	4

Sl.	Zone	Circle	No of Feeders	
			FY 2003-04	FY 2004-05
	Zone Total		3	4
26	Nagpur (U)	Nagpur (U)	1	1
27		Nagpur (R)		15
	Zone Total		1	16
28	Amravati	Yawatmal	4	4
29		Amarawati	3	3
30		Akola	2	2
31		Buldhana	2	2
	Zone Total		11	11
32	Aurangabad	Aurangabad	7	7
33		Parbhani		2
34		Jalana	2	3
	Zone Total		9	12
<b>Grand Total</b>			<b>199</b>	<b>181</b>

### 2.2.2.2 Filtering Criterion

The Hon'ble Commission vide clause no. 27.2.2.4 of Tariff Order for FY 2001-02 had considered range of -0.5 % to as +2% as acceptable range of losses for express feeders. As the Hon'ble Commission is aware, MSEDCL has already submitted clarifications vide letter dated 19<sup>th</sup> August 2003 for increase of range to -3% to +3%. MSEDCL has reiterated the rationale for correction in range below:

1. The substation end metering equipment is functioning at lower level due to high CT ratio installed, while consumers' CT ratio is selected based on contract demand. Therefore, the correctness of functioning is ensured at consumer end.
2. The bus PT is mounted at centre of the bus whereas substation end metering is installed in control room which is minimum 100 m away, so there is a drop in voltage to metering terminal, leading to negative reading.
3. VA burden on CT due to its long secondary cable affects the functioning.

**Hence, for analysis purpose a range of -3% to + 3% has been considered.** As can be seen, due to the application of this filter, the percentage of readings in acceptable range has increased from 66% in MSEDCL's previous submission in April 2003 to 80% and 86.55% in FY 2003-04 and FY 2004-05, respectively.

**2.2.2.3 Zone wise Analysis**

Total Sample readings for FY 2003-04 and FY 2004-05 were 2380 and 2164, respectively, which have increased from the previous ARR petition submitted in April 2003 (total sample readings were 2139). The total energy input and total consumption for FY 2003-04 was recorded to be 4954.57 MU and 4932.36 MU, respectively, which corresponds to 0.448% loss.

**Table: Zone wise Loss analysis for FY 2003-04**

S.NO	Zone	Total Readings	Readings within Filtering Range	Percentage in Filtering Range	Energy I/P (MU)	Energy Billed (MU)	Loss (MU)	% Loss for FY 2003 -04
1	Konkan	37	15	40.54%	29.02	28.67	0.35	1.20%
2	Bhandup	148	90	60.81%	117.03	116.95	0.07	0.06%
3	Kalyan	270	251	92.96%	1659.69	1651.31	8.38	0.50%
4	Nashik	450	355	78.89%	376.27	376.04	0.24	0.06%
5	Kolhapur	275	225	81.82%	153.94	154.27	-0.33	-0.21%
6	Pune	343	269	78.43%	852.75	852.47	0.28	0.03%
7	Aurangabad	108	96	88.89%	278.89	277.65	1.24	0.44%
8	Nagpur (R)	569	487	85.59%	1386.90	1374.98	11.92	0.86%
9	Beed	36	24	66.67%	4.29	4.26	0.03	0.64%
10	Nagpur (U)	12	12	100.00%	10.33	10.38	-0.05	-0.48%
11	Amravati	132	98	74.24%	85.46	85.38	0.08	0.09%
	<b>Total</b>	<b>2380</b>	<b>1922</b>	<b>80.76%</b>	<b>4954.57</b>	<b>4932.36</b>	<b>22.21</b>	<b>0.448%</b>

Total consumption for FY 2004-05 was recorded to be 5421.87 MU and 5394.37 MU, which corresponds to 0.447% loss.

**Table : Zone wise Loss analysis for FY 2004-05**

Sl.	Zone	Total Readings	Readings within Filtering Range	Percentage in Filtering Range	Energy I/P (MUs)	Energy Billed (MUs)	Loss (MUs)	% Loss for FY 2004 -05
1	Konkan	26	23	88.46%	9.94	8.57	0.16	1.64%
2	Bhandup	128	103	80.47%	134.32	133.55	0.16	0.12%
3	Kalyan	261	246	94.25%	1826.24	1813.21	13.03	0.71%
4	Nashik	390	331	84.87%	403.44	407.25	0.30	0.07%
5	Kolhapur	226	190	84.07%	149.93	149.73	0.19	0.13%
6	Pune	333	278	83.48%	940.81	938.96	1.86	0.20%
7	Aurangabad	113	105	92.92%	332.38	329.64	2.08	0.63%
8	Nagpur(R)	472	422	89.41%	1459.23	1451.25	6.09	0.42%
9	Beed	40	29	72.50%	3.68	3.69	-0.01	-0.19%
10	Nagpur (U)	55	51	92.73%	98.67	95.37	0.29	0.29%
11	Latur	4	3	75.00%	0.3936	0.3912	0.0024	0.61%
12	Amravati	116	92	79.31%	62.85	62.74	0.11	0.17%
	<b>Total</b>	<b>2164</b>	<b>1873</b>	<b>86.55%</b>	<b>5421.87</b>	<b>5394.37</b>	<b>24.25</b>	<b>0.447%</b>

### 2.2.3 MIDC Feeders

As the Hon'ble Commission is aware, the erstwhile MSEB has been submitting data relating to coverage and loss levels in its MIDC Areas on a regular basis. In this Petition, MSEDCL is submitting data relating to 85 MIDC areas spread across 11 Zones and 35 Circles for FY 2003-04 and FY 2004-05.

#### 2.2.3.1 Sampling Characteristics

The Zones, which have been covered, include – Amravati, Aurangabad, Beed-Latur, Bhandup, Kalyan, Konkan, Kolhapur, Nagpur, Nashik and Pune. MSEDCL has analysed the data pertaining to the corresponding feeder substation to arrive at the circle wise energy sent out, billed energy (HT and LT) for each month and loss levels, corresponding to these MIDC Feeders.

For FY 2003-04, the feeders have recorded consumption of 4177 MU and 4084 MU, at

the substation and consumer end, respectively, resulting in a loss of 2.24%. For FY 2004-05, the consumption figures were 3745 MU and 3683 MU respectively, resulting in a loss of 1.66%.

### 2.2.3.2 MIDC Coverage

The following table depicts the coverage of MIDC Feeders across Zones and Circles in FY 2003-04 and FY 2004-05. As can be seen, the coverage of MIDC Feeders has increased from 82 to 85 in FY 2004-05 as compared to FY 2003-04.

**Table - Coverage of MIDC Feeders in FY 2003-04**

Zone	Circle	MIDC Feeders	Zone	Circle	MIDC Feeders
<b>Amravati</b>	Akola	1	<b>Konkan</b>	Ratnagiri	3
	Amravati	1		Sindhudurg	1
	Buldhana	2	<b>Kolhapur</b>	Kolhapur	6
	Yawatmal	1		Sangli	3
<b>Aurangabad (U)</b>	A'bad Rural	1		Satara	4
	Aurangabad (U)	2		Solapur	2
	Jalna	1	<b>Nagpur</b>	Bhandara	2
	Parbhani	1		Chandrapur	1
<b>Beed</b>	Latur	1		Nagpur (R )	2
	Nanded	6		Wardha	1
	Osmanabad	1	<b>Nagpur(U)</b>	Nagpur (U)	2
<b>Bhandup (U)</b>	Bhandup (U)	1	<b>Nashik</b>	Ahmednagar	3
	Bhiwandi	1		Dhule	1
	Vashi	6		Jalgaon	2
<b>Kalyan</b>	Kalyan	5		Nashik	6
	Pen	4	<b>Pune</b>	Pune (U)	3
	Vasai	2		Pune (R )	3
<b>Total MIDC Areas</b>	82				

Table - Coverage of MIDC Feeders in FY 2004-05

Zone	Circle	MIDC Feeders	Zone	Circle	MIDC Feeders
<b>Amravati</b>	Akola	1	<b>Konkan</b>	Ratnagiri	3
	Amravati	1		Sindhudurg	1
	Buldhana	2	<b>Kolhapur</b>	Kolhapur	6
	Yawatmal	1		Sangli	3
<b>Aurangabad (U)</b>	A'bad Rural	1		Satara	4
	Aurangabad (U)	2		Solapur	2
	Jalna	1	<b>Nagpur</b>	Bhandara	2
	Parbhani	1		Chandrapur	1
<b>Beed</b>	Latur	1		Nagpur (R )	2
	Nanded	1		Wardha	1
	Osmanabad	1	<b>Nagpur (U)</b>	Nagpur(U)	2
<b>Bhandup (U)</b>	Bhandup (U)	1	<b>Nashik</b>	Ahmednagar	4
	Bhiwandi	1		Dhule	1
	Washi	12		Jalgaon	2
<b>Kalyan</b>	Kalyan	5		Nashik (R)	4
				Nashik (U)	2
	Pen	5	<b>Pune</b>	Pune (R)	4
	Vasai	1		Pune(U) Ganseshkhind	2
				Pune (U) Rastapeth	1
<b>Total MIDC Areas</b>			85		

### 2.2.3.3 Circle Wise Assessment

The following two Tables detail the circle-wise assessment of energy sent out, energy billed and loss levels for MIDC Feeders in FY 2003-04 and FY 2004-05. As can be seen, the overall loss levels have reduced significantly from 2.24% to 1.66%.

Table - Circle-Wise/Zone Wise Assessment of MIDC Feeders FY 2003-04

Zone	Circle	Units Sent Out (MU)	Units Billed (MU)	Loss (MU)	Loss (%)	Losses in FY 2002-03 (%)	Reduction over Previous Year
Amravati	Akola	28.08	26.76	1.32	4.71%	5.0%	0.29%
	Amravati	17.42	16.84	0.57	3.29%	5.0%	1.71%
	Buldhana	38.35	37.15	1.20	3.13%	3.5%	0.37%
	Yavatmal	2.01	1.99	0.02	1.15%	3.7%	2.55%
<b>Zone Total</b>		85.86	82.75	3.12	3.63%	<b>4.3%</b>	0.67%
Aurangabad	Aurangabad (U)	291.54	286.33	5.22	1.79%	1.7%	-0.09%
	Aurangabad (R)	22.21	21.80	0.41	1.86%	3.5%	1.64%
	Jalana	200.08	199.17	0.91	0.46%	0.5%	0.04%
	Parbhani	3.40	3.27	0.13	3.76%	4.8%	1.04%
<b>Zone Total</b>		517.23	510.56	6.67	1.29%	<b>1.4%</b>	0.11%
Beed	Latur	25.30	24.88	0.42	1.66%	1.3%	-0.36%
	Nanded	37.32	36.59	0.73	1.96%	2.0%	0.04%
	Osmanabad	1.32	1.24	0.08	6.08%	10.4%	4.32%
<b>Zone Total</b>		63.94	62.71	1.23	1.93%	<b>1.9%</b>	-0.03%
Bhandup	Bhandup (U)	11.67	11.37	0.30	2.53%	1.0%	-1.53%
	Vashi	690.30	674.22	16.07	2.33%	2.6%	0.27%
	Bhiwandi	15.32	14.71	0.61	4.00%	4.5%	0.50%
<b>Zone Total</b>		717.28	700.30	16.98	2.37%	<b>2.7%</b>	0.33%
Kalyan	Kalyan	240.60	234.48	6.12	2.54%	2.8%	0.26%
	Vasai	317.13	307.46	9.67	3.05%	2.4%	-0.65%
	Pen	247.95	245.97	1.97	0.80%	0.2%	-0.60%
<b>Zone Total</b>		805.67	787.92	17.75	2.20%	<b>1.7%</b>	-0.50%
Kolhapur	Kolhapur	220.61	215.49	5.12	2.32%	1.7%	-0.62%
	Pune (R)	111.95	110.35	1.60	1.43%	1.8%	0.37%
	Sangli	74.00	72.25	1.75	2.37%	3.5%	1.13%
	Satara	119.03	115.54	3.49	2.93%	3.7%	0.77%
	Solapur	75.38	74.57	0.81	1.07%	1.8%	0.73%

Zone	Circle	Units Sent Out (MU)	Units Billed (MU)	Loss (MU)	Loss (%)	Losses in FY 2002-03 (%)	Reduction over Previous Year
<b>Zone Total</b>		600.98	588.20	12.78	2.13%	<b>2.4%</b>	0.27%
Konkan	Ratnagiri	65.04	65.23	-0.20	-0.30%	-0.1%	0.20%
	Sindhudurg	5.06	4.89	0.17	3.30%	4.2%	0.90%
<b>Zone Total</b>		70.10	70.13	-0.03	-0.04%	<b>0.2%</b>	0.24%
Nagpur	Bhandara	5.26	5.14	0.12	2.37%	3.3%	0.93%
	Chandrapur	11.64	11.42	0.23	1.95%	-0.3%	-2.25%
	Nagpur (R)	79.72	79.56	0.16	0.20%	1.0%	0.80%
	Wardha	10.88	10.34	0.54	4.99%	5.1%	0.11%
<b>Zone Total</b>		107.51	106.45	1.05	0.98%	<b>1.4%</b>	0.42%
Nagpur (U)	Nagpur (U)	195.89	191.80	4.09	2.09%	3.3%	1.21%
<b>Zone Total</b>		195.89	191.80	4.09	2.09%	<b>3.3%</b>	1.21%
Nashik	Dhule	17.09	16.72	0.37	2.15%	3.7%	1.55%
	Jalagaon	113.69	107.13	6.56	5.77%	6.9%	1.13%
	Amhmednagar	104.65	99.43	5.22	4.99%	4.6%	-0.39%
	Nashik	543.02	530.47	12.54	2.31%	3.8%	1.49%
<b>Zone Total</b>		778.45	753.75	24.69	3.17%	<b>4.4%</b>	1.23%
Pune (U)	Pune(U)	234.37	229.00	5.38	2.29%	3.0%	0.71%
<b>Zone Total</b>		234.37	229.00	5.38	2.29%	<b>3.0%</b>	0.71%
<b>GRAND TOTAL</b>		<b>4177.29</b>	<b>4083.57</b>	<b>93.72</b>	<b>2.24%</b>	<b>3.0%</b>	<b>0.76%</b>

Table - Circle Wise/Zone Wise Assessment of MIDC Feeders for FY 2004-05

Zone	Circle	Units Sent Out (MU)	Units Billed (MU)	Loss (MU)	Loss (%)	Losses in FY 2003-04 (%)	Reduction over Previous Year
Amravati	Akola	30.12	28.95	1.16	3.9%	4.71%	0.8%
	Amravati	19.32	18.78	0.54	2.8%	3.29%	0.5%
	Buldhana	37.54	36.21	1.33	3.5%	3.13%	-0.4%
	Yavatmal	2.63	2.53	0.10	4.0%	1.15%	-2.8%

Zone	Circle	Units Sent Out (MU)	Units Billed (MU)	Loss (MU)	Loss (%)	Losses in FY 2003-04 (%)	Reduction over Previous Year
<b>Zone Total</b>		<b>89.61</b>	<b>86.46</b>	<b>3.14</b>	<b>3.5%</b>	3.63%	<b>0.1%</b>
Aurangabad	Aurangabad (U)	342.75	337.74	5.01	1.5%	1.79%	0.3%
	Aurangabad (R)	21.19	20.88	0.31	1.5%	1.86%	0.4%
	Jalana	227.94	226.55	1.39	0.6%	0.46%	-0.2%
	Parbhani	3.36	3.24	0.12	3.6%	3.76%	0.2%
<b>Zone Total</b>		<b>595.24</b>	<b>588.41</b>	<b>6.83</b>	<b>1.1%</b>	1.29%	<b>0.1%</b>
Beed	Latur	25.24	25.17	0.07	0.3%	1.66%	1.4%
	Nanded	41.29	40.36	0.93	2.3%	1.96%	-0.3%
	Osmanabad	1.50	1.39	0.11	7.2%	6.08%	-1.1%
<b>Zone Total</b>		<b>68.03</b>	<b>66.92</b>	<b>1.11</b>	<b>1.6%</b>	1.93%	<b>0.3%</b>
Bhandup	Bhandup (U)	16.72	16.34	0.38	2.3%	2.53%	0.2%
	Vashi	21.19	20.88	0.31	1.5%	2.33%	0.8%
	Bhiwandi	20.88	20.14	0.73	3.5%	4.00%	0.5%
<b>Zone Total</b>		<b>58.79</b>	<b>57.36</b>	<b>1.43</b>	<b>2.4%</b>	2.37%	<b>-0.1%</b>
Kalyan	Kalyan	259.09	253.49	5.60	2.2%	2.54%	0.4%
	Vasai	323.41	317.17	6.25	1.9%	3.05%	1.1%
	Pen	258.59	256.52	2.07	0.8%	0.80%	0.0%
<b>Zone Total</b>		<b>841.09</b>	<b>827.18</b>	<b>13.91</b>	<b>1.7%</b>	2.20%	<b>0.5%</b>
Kolhapur	Kolhapur	252.55	247.69	4.86	1.9%	2.32%	<b>0.4%</b>
	Pune (R)*	152.21	150.51	1.70	1.1%	1.43%	<b>0.3%</b>
	Sangli	84.09	82.30	1.79	2.1%	2.37%	<b>0.2%</b>
	Satara	119.03	116.31	2.72	2.3%	2.93%	<b>0.7%</b>
	Solapur	100.15	99.67	0.48	0.5%	1.07%	<b>0.6%</b>
<b>Zone Total</b>		<b>708.02</b>	<b>696.48</b>	<b>11.54</b>	<b>1.6%</b>	2.13%	<b>0.5%</b>
Konkan	Ratnagiri	59.09	58.76	0.33	0.6%	-0.30%	<b>-0.9%</b>
	Sindhudurg	17.56	17.33	0.23	1.3%	3.30%	<b>2.0%</b>
<b>Zone Total</b>		<b>76.65</b>	<b>76.09</b>	<b>0.56</b>	<b>0.7%</b>	-0.04%	<b>-0.8%</b>
Nagpur	Bhandara	6.71	6.60	0.11	1.6%	2.37%	<b>0.8%</b>
	Chandrapur	12.49	12.26	0.22	1.8%	1.95%	<b>0.1%</b>
	Nagpur (R)	101.32	105.49	-4.17	-4.1%	0.20%	<b>4.3%</b>
	Wardha	11.61	11.08	0.53	4.6%	4.99%	<b>0.4%</b>

Zone	Circle	Units Sent Out (MU)	Units Billed (MU)	Loss (MU)	Loss (%)	Losses in FY 2003-04 (%)	Reduction over Previous Year
<b>Zone Total</b>		<b>132.13</b>	<b>135.43</b>	<b>-3.30</b>	<b>-2.5%</b>	0.98%	<b>3.5%</b>
Nagpur (U)	Nagpur (U)	200.23	198.54	1.68	0.8%	2.09%	<b>1.2%</b>
<b>Zone Total</b>		<b>200.23</b>	<b>198.54</b>	<b>1.68</b>	<b>0.8%</b>	2.09%	<b>1.2%</b>
Nashik	Dhule	12.48	12.14	0.34	2.7%	2.15%	<b>-0.5%</b>
	Jalagaon	118.51	112.85	5.66	4.8%	5.77%	<b>1.0%</b>
	Amhmednagar	111.09	107.97	3.12	2.8%	4.99%	<b>2.2%</b>
	Nashik	518.71	505.43	13.28	2.6%	2.31%	<b>-0.3%</b>
<b>Zone Total</b>		<b>760.79</b>	<b>738.39</b>	<b>22.40</b>	<b>2.9%</b>	3.17%	<b>0.2%</b>
Pune (U)	Pune(U)	214.92	211.89	3.03	1.4%	2.29%	<b>0.9%</b>
<b>Zone Total</b>		<b>214.92</b>	<b>211.89</b>	<b>3.03</b>	<b>1.4%</b>	2.29%	<b>0.9%</b>
<b>GRAND TOTAL</b>		<b>3745.50</b>	<b>3683.16</b>	<b>62.34</b>	<b>1.66%</b>	<b>2.24%</b>	<b>0.58%</b>

\* Now Pune (Rural) is a part of Pune Zone

MSEDCL has been undertaking categorization of loss levels in order to determine the MIDC feeders, which are showing abnormal loss levels. MSEDCL understands the need for identifying and rectifying MIDC feeders which are showing abnormal loss levels and would like to assure the Hon'ble Commission that it is rectifying the malfunctioning feeders on a priority basis.

The categorization of circles according to loss levels for the year FY 2003-04 and FY 2004-05 is given in the Tables below.

**Table - Loss Categorization for FY 2003-04**

Range	MIDC Areas	Circles
-2%-0%	1	Ratnagiri (-0.3%)
0%-5%	79	
5%-10%	2	Osmanabad (6.08%) Jalgaon (5.77%)
<b>Grand Total</b>	<b>82</b>	

**Table - Loss Categorization for FY 2004-05**

Range	MIDC Areas	Circles
<-2%	2	Nagpur (R) (-4.1%)
0%-5%	82	
5%-10%	1	Osmanabad (7.2%)
<b>Grand Total</b>	<b>85</b>	

As can be seen, majority of the feeders are lying in the acceptable loss range of “0-5%” for both the years. MSEDCL is undertaking all efforts to ensure that all the MIDC feeders fall within the acceptable loss level range.

## 2.2.4 Circle-wise Distribution losses

### Sample characteristics

MSEDCL (erstwhile MSEB) has been submitting division-wise energy accounting data to Hon'ble Commission since January 2002. The data formats capture zone name, circle name, division name, energy input, billed energy and unmetered or assessed energy for each month. The analysis covers Amravati, Aurangabad, Beed, Bhandup, Kalyan, Kolhapur, Konkan, Nagpur, Nagpur-Urban, Nashik and Pune Zones.

### Filtering criteria

MSEDCL has continued with the same methodology stipulated by Hon'ble Commission in its Tariff Order for FY 2001-02 and all the division level feeders have been considered for the purpose of analysis.

### Computation of Zonewise/Circlewise T & D loss

MSEDCL has analysed month-wise energy accounting data for FY 2004-05. The distribution loss has been calculated as the difference between the energy input and energy billed for zone/circle. Energy billed is calculated as sum of metered sales and unmetered sales. Unmetered sale is calculated by using zonal consumption norm and actual connected load of circle, as directed by the Hon'ble Commission.

The circle wise agricultural consumption norm has been derived by applying the following filters:

- Minimum readings of 300 days
- Minimum reading of 300 hours and maximum reading of 3600 hours, which has been discussed in Section 1.1 - Agriculture feeder analysis. For circles where sampling has not been done, minimum consumption norm has been considered for calculation.

As the Hon'ble Commission is aware, MSEDCL has been submitting division-wise energy audit data on a quarterly /monthly basis. This data contains metered and unmetered consumption for all divisions, where unmetered consumption is calculated without applying any filters. The filters have not been applied to the division level data, since application of the same will result in selected divisions being excluded from the analysis, as the readings of these divisions are outside the range of the filters. MSEDCL is of the opinion that though the filters ensure that the outlier data is not considered for the representative analysis, the ceiling of 3600 hours or any other filter should not be applied, since it does not take into account the ground realities, where the agricultural consumption norm is higher than that being shown here.

However, in line with the Hon'ble Commission's Tariff Orders, division-wise analysis has been done after applying filters as specified by the Hon'ble Commission. Accordingly, there is bound to be variance between division-wise analysis as per monthly submissions and the analysis using filters, submitted in this Petition.

### **Results**

MSEDCL has analysed the energy accounting data for FY 2004-05 with the objective of arriving at Circlewise distribution loss. The Circle-wise distribution loss analysis for FY 2004-05 is shown in the Table below:

**Table 1: Zonewise / circlewise Distribution loss analysis for FY 2004-05**

Circles	Total Input Energy (in Mus)	Total Metered Energy (in Mus)	Total Unmetered Energy (in Mus)	Total Energy Assessed (in Mus)	Loss (in Mus)	Loss (in %)
Akola	1060.34	460.34	176.85	637.19	423.15	39.91%
Amravati	1086.08	511.41	144.89	656.30	429.78	39.57%
Buldhana	892.02	409.93	172.53	582.46	309.56	34.70%
Yavatmal	810.46	302.66	159.60	462.26	348.20	42.96%
Aurangabad(U)	1271.80	817.72	5.12	822.84	448.95	35.30%
Aurangabad	1314.22	341.53	414.57	756.10	558.12	42.47%
Jalna	1147.38	502.79	230.16	732.95	414.43	36.12%
Parbhani	1313.59	208.00	352.70	560.71	752.88	57.31%
Beed	1219.47	163.69	319.04	482.73	736.74	60.41%
Latur	1233.91	232.35	338.55	570.89	663.02	53.73%
Nanded	1311.02	238.89	289.95	528.84	782.18	59.66%
Osmanabad	823.56	147.47	243.91	391.39	432.18	52.48%
Bhiwandi	2301.11	1427.61	1.42	1429.03	872.08	37.90%
Thane(U)	2180.82	1719.35	0.00	1719.35	461.47	21.16%
Washi	2489.54	2181.29	0.04	2181.33	308.22	12.38%
Kalyan (U)	2338.84	988.85	New circle	988.85	766.69	32.78%
Kalyan		580.77	2.53	583.30		
Pen	3042.69	2727.40	6.34	2733.74	308.95	10.15%
Vasai	2207.04	1761.55	20.80	1782.35	424.69	19.24%
Ratnagiri	674.28	565.78	1.19	566.97	107.31	15.91%
Sindudurg	194.95	141.51	0.01	141.52	53.43	27.41%
Kolhapur	2282.47	1633.38	239.88	1873.26	409.21	17.93%
Sangli	1459.77	756.89	386.31	1143.20	316.57	21.69%
Satara	1146.94	659.43	266.68	926.11	220.83	19.25%
Solapur	2642.10	837.56	848.74	1686.30	955.80	36.18%
Nagpur (R)	1712.14	1278.81	84.31	1363.12	349.02	20.39%
Nagpur (U)	1582.86	1047.39	0.05	1047.44	535.42	33.83%
Bhandara	1037.88	567.85	75.95	643.80	394.08	37.97%
Chandrapur	1193.87	1014.15	24.48	1038.64	155.23	13.00%
Gadhiroli	280.34	144.43	26.81	171.24	109.10	38.92%
Wardha	1041.20	859.39	35.72	895.11	146.08	14.03%
A' Nagar	2471.76	619.62	920.18	1539.80	931.96	37.70%
Dhule	1809.94	471.84	536.26	1008.11	801.83	44.30%

Circles	Total Input Energy (in Mus)	Total Metered Energy (in Mus)	Total Unmetered Energy (in Mus)	Total Energy Assessed (in Mus)	Loss (in Mus)	Loss (in %)
Jalgaon	3215.85	979.82	673.89	1653.71	1562.14	48.58%
Nasik (U)	1170.04	854.25	52.21	906.47	263.57	22.53%
Nasik	3225.17	1039.35	915.82	1955.17	1269.99	39.38%
Ganeshkhind	2427.03	2059.25	New circle	2059.25	367.77	15.15%
Pune(R)	3393.92	1698.31	645.43	2343.74	1050.17	30.94%
Rastapeth(U)	1672.16	1361.08	17.04	1378.12	294.05	17.58%
<b>Subtotal</b>	<b>62678.54</b>	<b>34313.72</b>	<b>8629.97</b>	<b>42943.70</b>	<b>19734.84</b>	<b>31.49%</b>
TATA Sale	54.46			54.46		
Mula Pravara	551.56			551.56		
<b>Total</b>	<b>63284.56</b>	<b>34313.72</b>	<b>8629.97</b>	<b>43549.72</b>	<b>19734.84</b>	<b>31.00%</b>

Thus, for FY 2004-05, energy input was 63284.56 MU, while metered and un-metered sales were 34313.72 MU and 8629.97 MU, respectively, and distribution loss was 31.00%.

## 2.2.5 Trajectory of Distribution Loss Reduction

The above distribution loss has been considered as the system loss for FY 2004-05, and an annual reduction of 2% has been considered for FY 2005-06 and FY 2006-07, to project the energy input requirement. The distribution loss reduction has not been projected on a circle-wise basis. The targeted long-term reduction in circle-wise distribution losses has been formulated in view of the investments being planned for each circle, as submitted in the Investment Plan presented to the Commission. The summary of circle-wise target for loss reduction for FY 2006-07 is as follows:

For Circles with above 40% - 3% reduction in every year Distribution losses
For Circles having losses between 30% to 40% - 3% reduction in every year for three years and 1.5% in next two years
For Circles having losses between 25% to 30% - 3% in first two years and 1% in next three years
For Circles having losses between 20% to 25% - 1.5% in first two years and 1% in next three years

However, the Commission will appreciate that as the investments will be made during the year, the benefits of the investment will only be partly visible during the year itself, and hence, it is difficult to co-relate the circle-wise investment plan with the distribution loss reduction projected for FY 2006-07.

### 2.3 Energy Input Requirement

The total energy input requirement is the summation of the projected sales and the distribution loss, as shown in the Table below:

Energy Balance	FY05	FY06	FY07
Power Purchase from Maha GENCO	47131	46459	47798
Power Purchase from Other Sources	20043	23272	30654
<b>Energy Input Available</b>	<b>67174</b>	<b>69731</b>	<b>78453</b>
Metered Sales	34346	36457	40905
Assessed Un-metered Sales	8636	9499	12349
Credit Billing (on a/c of TPS by RE sources)	581	581	581
<b>Total Sales</b>	<b>43562</b>	<b>46537</b>	<b>53834</b>
<b>Distribution loss Reduction</b>		<b>2.0%</b>	<b>2.0%</b>
DISCOM's Distribution Losses	31.00%	29.00%	27.00%
TRANSCO's transmission losses	6.01%	6.00%	6.00%
<b>DISCOM's energy requirement</b>	<b>63136</b>	<b>65547</b>	<b>73749</b>
TRANSCO's energy requirement	67174	69731	78456

### **3 MSEDCL'S AGGREGATE REVENUE REQUIREMENT**

MSEDCL's (Maha Vitaran's) Aggregate Revenue Requirement (ARR) comprises the following heads of expenditure, return on equity, and non-tariff income:

- a) Power Purchase Expenses
- b) Operation & Maintenance Expenses
  - (i) Employee Expenses
  - (ii) Administration & General Expenses
  - (iii) Repair & Maintenance Expenses
- c) Depreciation Expenditure
- d) Interest Expenditure
  - (i) Interest on long-term loans
  - (ii) Other interest & finance charges
  - (iii) Working Capital Interest
- e) Provisioning for bad debts
- f) Other Expenses
- g) Income Tax
- h) Transmission charges paid/payable to MSETCL
- i) Contribution To Contingency Reserves
- j) Return On Equity
- k) Non- tariff income

The details of each of the above heads of expenditure and return on equity have been provided in the Data Formats (draft) prescribed by the Hon'ble Commission, in the Annexure I to the Petition. In this Section, MSEDCL has given the detailed rationale and justification for each of these heads of expenditure and return.

The Hon'ble Commission may also please note that separate accounts of expenditure and revenue have not been maintained for the DISCOM in FY 2004-05, as the DISCOM was a part of the erstwhile MSEB, and was created through the provisional Transfer Scheme with effect from June 5, 2005. However, keeping in mind the Data Formats prescribed by the Hon'ble Commission, and the need to have comparative data for previous years, MSEDCL has provided separate data for MSEDCL on the basis of Trial Balances and appropriate allocation of Head office expenses. The actual un-audited expenses of the erstwhile MSEB for the previous year, i.e., FY 2004-05, have been accordingly allocated to the DISCOM and have been considered for this Petition.

Though the Data Formats prescribed by the Hon'ble Commission require MSEDCL to submit data on the actual expenditure in the first half of the current year, i.e., FY 2005-06, MSEDCL has provided separate data on un-audited expenses for the period from April 1, 2005 to June 5, 2005, and for the period from June 6, 2005 to September 30, 2005, as prior to June 5, 2005, the erstwhile MSEB was the existing Utility, and the expenses of DISCOM have been indicated on the same basis as that applied for FY 2004-05. It should be noted that the actual expenses incurred/booked in the first half of the year are not truly reflective of the annual expenditure, as several provisions are made during the second half of the year. Accordingly, the expenditure for FY 2005-06 has been estimated on the past trends in the overall expenditure, rather than the actual expenditure in the first half of the year. Projections for FY 2006-07 have been made on the basis of past trends and expenditure allocated to DISCOM.

### **3.1 Power Purchase Expenses**

#### **3.1.1 Sources of Power**

The MSEDCL has two sources of firm power, viz.

- Maharashtra State Power Generation Company Limited (MSPGCL)
- Purchase from Central Generating Stations

In addition to the above sources, MSEDCL buys power from The Tata Power Company Limited (TPC), Power Trading Corporation (PTC), other trading companies and other sources such as non-conventional sources including co-generation, wind power and surplus power from captive plants.

The erstwhile MSEB in its earlier ARR and Tariff Petition for FY 2003-04 had estimated the total cost of power purchase in accordance with the principle of "Merit Order Dispatch" and by carrying out Merit Order Simulations on the month wise representative load curves and the Commission has also approved the power purchase costs of erstwhile MSEB based on the Merit Order Dispatch principle. MSEDCL would like to submit that as compared to FY 2002-03, when the previous ARR was submitted by MSEB, the demand supply position in the State has changed drastically. During FY 2002-03, the shortage of power was very low and that too only during the peak hours and for the remaining part of the day, surplus power was available and hence Merit Order Dispatch principle could be adopted while estimating the power purchase costs.

At present, the State of Maharashtra is facing power shortage throughout the day and no surplus power is available during any part of the day. Currently, the demand supply gap during peak hours has increased to around 4500 MW. MSEDCL is trying to purchase power from all the available sources to reduce the demand supply gap. This situation of demand supply gap is expected to continue during the ensuing year, i.e., FY 2006-07 also, and it is estimated that the surplus power will not be available during FY 2006-07 also, even after considering all the possible sources of generation, including Ratnagiri Gas and Power Limited, Paras and Parli expansion projects, etc. In view of huge demand supply gap in the system, the applicability of merit order dispatch principle for estimating the power purchase cost for FY 2006-07 is not relevant and MSEDCL has considered the entire power available from all the possible sources during FY 2006-07 to meet the demand to the extent possible.

### 3.1.2 Power Purchase from MSPGCL

The MSPGCL has submitted a Petition on 10<sup>th</sup> February 2006 to the Hon'ble Commission for approval of Annual Revenue Requirement and Tariff Determination for FY 2006-07. MSEDCL, while estimating its power purchase costs for power purchased from MSPGCL, has considered the total energy availability and the total costs based on the Petition filed by MSPGCL before the Commission. The summary of actual power purchase during FY 2004-05, estimated power purchase during FY 2005-06 and projected power purchase during FY 2006-07 from MSPGCL alongwith total power purchase costs is given in the Table below:

**Table: Summary of Power Purchase from MSPGCL alongwith Power Purchase Costs**

Particulars	Unit	FY 2004-05	FY 2005-06	FY 2006-07
		Actual	Estimated	Projected
<b>Purchase from MSPGCL</b>				
Power Purchase	MU	47131	46459	47798
Total Fuel costs	Rs Crore	4835	4997	5590
Variable Cost per unit	Rs/kWh	<b>1.03</b>	<b>1.08</b>	<b>1.17</b>
Fixed Costs	Rs Crore	1670	2449	2886
Total Cost	Rs Crore	6504	7446	8476
<b>Total Cost per Unit</b>	<b>Rs/kWh</b>	<b>1.38</b>	<b>1.60</b>	<b>1.77</b>

### 3.1.3 Power Purchase from Central Generating Stations

#### 3.1.3.1 MSEDCL's Share in Central Generating Stations

Central Generating Stations (CGS) comprise of stations belonging to the National Thermal Power Corporation (NTPC) and the Nuclear Power Corporation Ltd. (NPC). Maharashtra has got a firm share allocation for drawal of power from five stations of

NTPC and three NPC Stations. In addition to the firm share allocation, most of these stations have 15% unallocated power. The distribution of this unallocated power among the constituents of Western Region is decided from time to time based on power requirement and power shortage in different States. MSEDCL also gets a substantial portion of the unallocated share. MSEDCL's current share in Central Generating Stations is summarized in the following Table:

**Table : Maharashtra's Share in Central Generating Stations**

S.No	Station	Capacity	Maharashtra Share (%)			Maharashtra Share
			MW	Firm Sh.	UA share	Total Share
1	Korba	2100	29.05%	3.31%	32.36%	679.5
2	Vindhyachal-1	1260	32.54%	3.96%	36.50%	459.9
3	Vindhyachal-II	1000	31.90%	4.01%	35.91%	359.1
4	Kawas	656.2	31.09%	4.00%	35.09%	230.3
5	Gandhar	657	30.42%	4.04%	34.47%	226.6
	<b>NTPC Total</b>					<b>1955.3</b>
1	Kakrapar	440	28.41%	4.05%	32.46%	142.8
2	Tarapur-1&2	320	50%	0%	50.00%	160.0
3	Tarapur-4	540	36.39%	4.05%	40.44%	218.4
	<b>NPC total</b>					<b>521.2</b>

The Tarapur 4 Station of Nuclear Power Corporation (NPC) has been commissioned in the current year and firm power from Tarapur 4 is available from 12<sup>th</sup> September 2005. In addition to share from these Central Generating Stations, MSEDCL also buys power from the Eastern Region Stations of NTPC namely, Kahalgaon Thermal Power Station, Farraka Super Thermal Power Station and Talcher Super Thermal Power Station.

### 3.1.3.2 Quantum of Power Purchase from Central Generating Stations

The quantum of power purchase for FY 2005-06 from Central Generating Stations has been estimated based on actual power purchase during the first nine months from April to December 2005 and by estimating the power purchase for the next three months from January 2006 to March 2006.

For projecting the energy availability from NTPC Stations during FY 2006-07, MSEDCL has considered the target PLF of 80% in accordance with the CERC norms. Further, the PLF of NPC stations Tarapur 1&2 and Kakrapar has been considered as 80% based on the past trends and the PLF of Tarapur 4 has been considered as 60%. The auxiliary consumption for each of the NTPC and NPC stations has been considered based on the norms approved in the CERC/Government guidelines. The effective share of MSEDCL is applied on the Energy Sent Out to estimate the energy purchases from the respective Stations. Further for estimating the net energy

availability to MSEDCL, the external transmission losses, i.e., external to Maharashtra State Electricity Transmission Company Limited (MSETCL) has been considered as 4.5% based on the past trends. The Table below provides the values of the key parameters considered by the MSEDCL to project the energy available from the Central Generating Stations during FY 2006-07 and MSEDCL's share of energy in each station.

**Table : Energy Availability from Central Generating Stations during FY 2006-07**

S.No	Station	Capacity	PLF	Gross Generation	Aux. Cons	Energy Sent Out	MSEDCL Share	Ext. Tr. Losses	Net Available to MSEDCL*
		MW	%	MU	%	MU	MU	%	MU
1	Korba	2100	80%	14717	9%	13392	4333	4.50%	4138
2	Vindhyachal-1	1260	80%	8830	9%	8035	2933	4.50%	2801
3	Vindhyachal-II	1000	80%	7008	9%	6377	2290	4.50%	2187
4	Kawas	656	80%	4599	3%	4461	1565	4.50%	1495
5	Gandhar	657	80%	4607	3%	4469	1540	4.50%	1471
	<b>NTPC Total</b>								<b>12092</b>
1	Karkapar	440	80%	3084	10%	2775	901	4.50%	860
2	Tarapur-1&2	320	80%	2243	10%	2018	1009	2.50%	984
3	Tarapur-4	540	60%	2838	10%	2554	1033	4.50%	986
	<b>NPC total</b>								<b>2831</b>

**Note:** \* - this quantum is the power available at the State boundary; the net energy available to MSEDCL would have to be reduced to the extent of the transmission losses of MSETCL

The summary of station-wise actual energy purchased during FY 2004-05, estimated energy purchase during FY 2005-06 and projected energy purchase during FY 2006-07 from Central Generating Stations is given in the following Table (Details given in Form 2 of Annexure 1):

**Table : Summary of Energy Purchase from CGS (MU)**

Source	FY 2004-05	FY 2005-06	FY 2006-07
	Actual	Estimated	Projected
Korba	4738	4655	4138
Vindhyachal-1	3073	2976	2801
Vindhyachal-II	2386	2324	2187
Kawas	1381	1495	1495
Gandhar	1245	1471	1471
<b>NTPC Total</b>	<b>12825</b>	<b>12921</b>	<b>12092</b>
Kakrapar	1004	860	860
Tarapur - 1&2	1152	984	984
Tarapur 4		719	986
<b>NPC total</b>	<b>2156</b>	<b>2564</b>	<b>2831</b>
<b>Eastern Region</b>	<b>672</b>	<b>767</b>	<b>0</b>
<b>Total</b>	<b>15652</b>	<b>16252</b>	<b>14923</b>

### 3.1.3.3 Power Purchase Costs for purchase of power from CGS

The costs of power purchase from Central Generating Stations has been estimated as follows:

- Fixed charges for NTPC stations by considering the Annual Fixed Charges as approved by the Central Electricity Regulatory Commission (CERC) in proportion to Maharashtra's total Share (Firm + Unallocated share)
- Variable Cost for FY 2005-06 based on the actual variable cost per unit including Fuel Cost Adjustment for the period April to December 2005
- Variable Cost per unit for FY 2006-07 by considering 4% escalation over the actual variable cost for the period April to December 2005
- Incentive payable to NTPC stations based on the estimated power purchase above 80% PLF computed in accordance with the formula approved by CERC
- Income Tax payable to Central Generating Stations based on past trends.

The summary of station wise actual power purchase cost during FY 2004-05, estimated power purchase cost during FY 2005-06 and projected power purchase cost during FY 2006-07 from Central Generating Stations is given in the following Table (Details given in Form 2 of Annexure 1):

**Table : Summary of Power Purchase Cost for purchase of Power from CGS**

Source	FY 2004-05		FY 2005-06		FY 2006-07	
	Total Cost	Avg Cost per unit	Total Cost	Avg Cost per unit	Total Cost	Avg Cost per unit
	Rs Crore	Rs/kWh	Rs Crore	Rs/kWh	Rs Crore	Rs/kWh
Korba TPS	411.8	0.87	407	0.87	373	0.90
Vindhyachal 1 TPS	398.3	1.3	422	1.42	412	1.47
Vindhyachal 2 TPS	360.6	1.51	367	1.58	359	1.64
Kawas	733.6	5.31	547	3.66	586	3.92
Gandhar	309.5	2.49	367	2.50	375	2.55
Eastern Region	130.9	2.01	142	1.85	0	0.00
Kakrapar	239.0	2.38	210	2.44	219	2.54
Tarapur - 1&2	119.4	1.04	105	1.06	109	1.11
Tarapur 4			108	1.50	246	2.50
<b>Total</b>	<b>2706</b>		<b>2675</b>		<b>2679</b>	

MSEDCL would like to submit that the power purchase cost have been estimated based on the average actual rate for the period April to December 2005. However, with the increase in power purchase from NTPC Kawas Station with naphtha as fuel and other traders/sources, the power purchase cost will increase and the details of the same will be submitted separately.

In addition to above costs, the income tax payable to NTPC and NPC has been estimated at Rs 163 Crore for each of the FY 2005-06 and FY 2006-07.

### 3.1.4 Power Purchase from Sardar Sarovar Project

For FY 2005-06, the power purchase from Sardar Sarovar Project (SSP) has been estimated based on actual power purchase during the first nine months from April to December 2005 and by estimating the power purchase for the next three months from January 2006 to March 2006. The total power purchase from SSP during FY 2005-06 is estimated at 530 MU and the same has been assumed for FY 2006-07. Based on actual power purchase cost, the average cost of power purchase from SSP works out to Rs 4.18/kWh and the same has been considered for estimating the power purchase costs during FY 2005-06 and FY 2006-07. Accordingly, the total power purchase costs for power purchase from SSP during FY 2006-07 is estimated at Rs 221 Crore.

### 3.1.5 Power Purchase from Ratnagiri Gas and Power Private Limited (RGPPL)

The Ratnagiri Gas and Power Private Ltd. (RGPPL) (erstwhile Dabhol Power Company) project has also been re-commissioned during FY 2006-07. The Phase I of the Project (740 MW) became operational by 1<sup>st</sup> May 2006.

MSEDCL had made certain assumptions regarding power availability and rate of power purchase from RGPPL, while estimating the quantum and cost of power purchase in its ARR Petition. However, subsequent developments have resulted in MSEDCL having to revise the quantum and rate of power purchase from RGPPL, due to non-availability of gas for the plant, which has to now be operated on naphtha, which is significantly costlier. The quantum and cost of power purchase from RGPPL as being considered based on latest information is given below:

**Table: Power Purchase from RGPPL considered based on latest information**

S.No	Unit	Capacity (in MW)	Period	Net Gen (MU)	Rate (Rs/kWh)	Cost (Rs Crore)
1	Phase I	740	May 06- June 06	345	4.25	147
2	Phase I	740	July'06 -Sep'06	0	7.00	0
3	Phase I	740	Oct'06 - Dec'06	1240	7.00	868
4	Phase I	740	Jan 07 - Mar 07	1240	3.50	434
5	Phase 2 - BI 1	740	Nov 06- Dec06	0	7.00	0
6	Phase 2 - BI 1	740	Jan 07 - Mar 07	1240	3.50	434
7	Phase 2-BI 2	740	Likely to come later	0	7.00	0
	<b>TOTAL</b>			<b>4066</b>		<b>1883</b>

MSEDCL has assumed that only Phase I and Stage II Block I will be available during FY 2006-07. MSEDCL has assumed that both the Units will run on naphtha till December 2006, and thereafter gas may be available in the spot market, when the generation cost will reduce to Rs. 3.50 per kWh. The average rate for purchase from RGPPL works out to Rs. 4.63 per kWh. In case gas is not available for any reason, then the additional cost of power purchase due to naphtha based generation, would amount to Rs. 868 crore, and the average rate of power purchase from RGPPL would increase to Rs. 6.77 per kWh. Any variation in the power purchase cost arising out of the variation in the price of gas/naphtha would be passed through under the FAC mechanism.

### **3.1.6 Power Purchase from Trading Companies**

As mentioned in earlier paragraphs, considering the current demand supply gap position, MSEDCL is trying to purchase power from all the available sources to reduce the demand supply gap. The actual quantum of power purchased from trading companies during FY 2004-05 is 2677 MU at a total cost of Rs 718 Crore. The actual average cost of power purchase from trading companies for the power purchased during FY 2004-05 works out to Rs 2.68/kWh.

For FY 2005-06, the power purchase from Trading Companies has been estimated based on actual power purchase during the first nine months from April to December 2005 and by estimating the power purchase for the next three months from January 2006 to March 2006. The actual power purchases from trading companies during the first nine months from April to December 2005 is around 2176 MU at an average power purchase rate of Rs 3.42/kWh.

Due to demand supply gap in several States, the average cost of power purchase from trading companies is increasing substantially and as indicated earlier, the average cost during April to December 2005 has increased to Rs 3.42/kWh as against the average cost of Rs 2.68/kWh during FY 2004-05.

For the next three months, January 2006 to March 2006, the power purchase from trading companies has been estimated based on the short term agreements entered into by MSEDCL with the trading companies. Power purchase of around 800 MW on 'round the clock' basis has been considered for estimating the total power availability during the three months January 2006 to March 2006 and for estimating the power

purchase cost, an average rate of Rs 4.00/kWh has been assumed based on the short term agreements with the trading companies.

The total power purchase from trading companies during FY 2005-06 is estimated at 3904 MU and the total power purchase cost is estimated at Rs 1435 Crore. The average power purchase rate for purchase of power from trading companies during FY 2005-06 works out to Rs 3.68/kWh.

For estimating the power purchase from trading companies during FY 2006-07, 400 MW of power purchase on 'round the clock' basis has been assumed and the estimated power purchase from trading companies works out to 3504 MU. The average power purchase rate for trading companies has been assumed as Rs 4/kWh and the total estimated power purchase cost for purchase of power from trading companies during FY 2006-07 works out to Rs 1402 Crore.

In addition, MSEDCL has assumed that the shortfall in quantum of power purchase due to the shortfall in anticipated RGPPL generation, will be made up by short-term power purchase from traders and other sources at a rate varying between Rs. 3.00 to Rs. 4.50 per kWh. For computation of the ARR, this quantum of 5443 MU has been assumed to be purchased at a rate of Rs. 3 per kWh, at a cost of Rs. 1632 crore.

### **3.1.7 Power Purchase from Other Sources**

#### **3.1.7.1 Power Purchase from Tata Power Company (TPC) Limited**

For FY 2005-06, the power purchase from TPC has been estimated based on actual power purchase during the first nine months from April to December 2005 and by estimating the power purchase for the next three months from January 2006 to March 2006. The actual power purchase from TPC for first nine months from April to December 2005 is 600 MU. For the period January to March 2006, power purchase of around 100 MW for 3 hours per day has been assumed. The total power purchase from TPC during FY 2005-06 is projected at 654 MU. The actual average rate of power purchase from TPC for first nine months works out to Rs 2.75/kWh and the same has been assumed for estimating the total power costs during FY 2005-06. The total estimated cost of power purchase from TPC during FY 2005-06 works out to Rs 180 Crore.

#### **3.1.7.2 Power Purchase from Wind Energy Projects, Co-Generation Projects and Dodson Project**

For FY 2005-06, the power purchase from these sources has been estimated based on actual power purchase during the first nine months from April to December 2005 and by estimating the power purchase for the next three months from January 2006 to March 2006.

The power purchase from Wind Energy Projects and Co-generation Projects during FY 2006-07 has been estimated considering the expected capacity addition during FY 2006-07. The power purchase rate for purchase of power from Wind Energy Projects and Co-generation Projects has been considered based on the rates approved by the Commission.

The power purchase from Dodson during FY 2006-07 has been assumed at same level as that of FY 2005-06. The power purchase cost for Dodson Project for FY 2005-06 has been estimated considering the actual average power purchase rate for the period April to December 2005. For FY 2006-07, an increase of 4% in average power purchase rate has been assumed for estimating the total power purchase costs.

The summary of actual power purchase and the power purchase cost for FY 2004-05, estimated power purchase and power purchase costs for FY 2005-06 and FY 2006-07 from other sources is summarised in Table below:

**Table : Summary of Power Purchase from other Sources**

Source	FY 2004-05 (Actual)			FY 2005-06 (Estimated)			FY 2006-07 (Estimated)		
	Quantum	Total Cost	Avg. Cost	Quantum	Total Cost	Avg. Cost	Quantum	Total Cost	Avg. Cost
	MU	Rs Crore	Rs/kWh	MU	Rs Crore	Rs/kWh	MU	Rs Crore	Rs/kWh
TPC	540	155	2.87	654	180	2.75			
Dodson	36	9	2.66	36	10	2.77	36	10	2.88
Wind				245	85	3.48	518	185	3.57
Cogen and Captive	346	104	3.01	265	84	3.17	735	238	3.23
<b>Total</b>	<b>922</b>	<b>268</b>	<b>2.82</b>	<b>1200</b>	<b>359</b>	<b>2.99</b>	<b>1289</b>	<b>433</b>	<b>3.36</b>

In the context of power purchase from renewable energy sources, MSEDCL would like to highlight that the Hon'ble Commission has passed an Order on the Renewable Purchase Obligation (RPO) and the sharing of the same between the licensees. MSEDCL is purchasing significantly higher quantum of renewable energy than its obligation under RPO.

### 3.1.8 UI Energy

The Commission in its Order on MSEB's ARR and Tariff Petition for FY 2003-04 had directed to restrict the net power drawal from UI energy to 1% of the total energy input. The total net energy purchase from UI during FY 2004-05 is 792 MU, which works out to 1.18% of total energy input. The total cost of UI energy received during FY 2004-05 is 224 Crore and the average rate works out to Rs 2.82/kWh.

For FY 2005-06, the actual UI energy received during the first nine months from April to December 2005 is around 1187 MU. For the period January to March 2006, net receipt of 200 MU of UI energy has been assumed and for FY 2006-07, net receipt of 900 MU UI energy has been assumed.

The total cost of UI Energy for FY 2005-06 has been estimated considering the actual average rate for the period April to December 2005, which works out to around Rs 3.02/kWh. For FY 2006-07, an increase of 4% in average rate has been assumed for estimating the total costs of UI Energy.

The summary of net UI Energy alongwith the costs, is given in Table below:

**Table : Summary of UI Energy**

Particulars	FY 2004-05 (Actual)			FY 2005-06 (Estimated)			FY 2006-07 (Estimated)		
	Quantum	Total Cost	Avg. Cost	Quantum	Total Cost	Avg. Cost	Quantum	Total Cost	Avg. Cost
	MU	Rs Crore	Rs/kWh	MU	Rs Crore	Rs/kWh	MU	Rs Crore	Rs/kWh
UI Energy	792	224	2.82	1387	419	3.02	900	283	3.14

### 3.1.9 External Transmission Charges

The total external transmission charges payable to PGCIL for transmission of Central Sector Power has been estimated at Rs 190 Crore each for FY 2005-06 and FY 2006-07 respectively.

The entire transmission charges payable to PGCIL has been considered as a part of MSEDCL's ARR, and has not been included as a part of MSETCL's ARR.

### 3.1.10 Summary of Total Power Purchase and Power Purchase Cost

The summary of total power purchase and power purchase cost of MSEDCL is given in Table below (Details given in Form 2 of Annexure 1):

**Table : Summary of Total Power Purchase**

Source	FY 2004-05 (Actual)			FY 2005-06 (Estimated)			FY 2006-07 (Estimated)		
	Quantum	Total Cost	Avg. Cost	Quantum	Total Cost	Avg. Cost	Quantum	Total Cost	Avg. Cost
	MU	Rs Crore	Rs/kWh	MU	Rs Crore	Rs/kWh	MU	Rs Crore	Rs/kWh
MSPGCL	47131	6504	1.38	46459	7446	1.60	47798	8476	1.77
CGS	15632	2706	1.73	16252	2675	1.65	14923	2679	1.80
SSP				530	222	4.18	530	221	4.18
RGPPPL							4066	1883	4.63
Trading Cos	2677	718	2.68	3904	1435	3.68	3504	1402	4.00
Other Traders & Sources*							5443	1632	3.00
Other Sources	922	268	2.91	1200	359	2.99	1289	433	3.36
UI Energy	792	224	2.82	1387	419	3.02	900	283	3.14
Transmission Charges		177			190			190	
Income Tax on CGS		153			160			160	
<b>Total</b>	<b>67154</b>	<b>10750</b>	<b>1.60</b>	<b>69731</b>	<b>12994</b>	<b>1.86</b>	<b>78453</b>	<b>17359</b>	<b>2.21</b>

**Note:** \* to make up for shortfall in RGPPPL generation, vis-à-vis anticipated generation

The total quantum of power purchase is projected at 78453 MU in FY 2006-07, which is estimated to cost around Rs. 17359 crore. However, if there is a variation in the power purchase costs on account of variation in the fuel costs, MSEDCL would be entitled to recover the same through the Fuel Adjustment Charge (FAC) Formula, under the provisions of the MERC (Terms and Conditions of Tariff) Regulations, 2005. In this context, MSEDCL has filed a separate Petition before the Hon'ble Commission for relaxation of the cap of 10% on recovery of FAC, as it adversely affects the liquidity position of MSEDCL, and the Commission has relaxed the same, with prior approval to be given by the Commission for recovery of FAC, on a case to case basis.

#### **LOAD SHEDDING VS POWER PURCHASE COST**

The load shedding in MW and MU, total power purchase cost in Rs. Crore and average power purchase cost in Rs/kWh for FY 05 (actual), FY 06 (actual) and FY 07 (proposed) is given in the following Table. The increase in the demand - supply gap is the primary reason for the increase in load shedding, which has necessitated higher incidence of costly power purchase.

Sl.	Particulars	FY05	FY06	FY07
1	Peak Demand (MW)	12749	14061	14600
2	Availability (At the time of Peak Demand ) (MW)	9704	9856	10100
3	Load shedding(At the time of Peak Demand ) (MW)	3045	4205	4500
4	Load shedding(At the time of Peak Demand ) (MU)	38.85	66.5	70.43
5	Total power purchase cost (Rs. Cr)	10706.9	12790.4	17358.9
7	Average power purchase cost (Rs/kWh)	1.60	1.86	2.21

The Commission has stipulated the load shedding protocol, wherein the divisions are categorized as urban and industrial agglomerations, agricultural dominated regions, and other regions, and classified as A, B, C or D group, depending on the distribution and collection loss in the division. The hours of load shedding has been stipulated with defined ceiling levels of load shedding for the demand-supply gap level of 4500 MW. The maximum load shedding is for D category agricultural dominated region, at 12 hours daily, while the least load shedding is for A category urban and industrial agglomerations, at 2.5 hours.

If the Load Shedding Protocol is maintained, and all the power available is purchased (including power available at rates above Rs. 4 per kWh), then the load shedding for D category agricultural dominated region is expected to range between 8 hours (January 2007) to 12 hours (December 2006), while the load shedding for the A category urban and industrial agglomerations is expected to range between 1.5 to 2.5 hours. However, hypothetically, in case costly power (above Rs. 4/kWh) is not purchased, then the load shedding for D category agricultural dominated region is expected to range between 13.5 hours (October 2006) to 16.5 hours (December 2006), while the load shedding for the A category urban and industrial agglomerations is expected to range between 4 to 7 hours.

If the load shedding is done equally for all regions and groupings, irrespective of categorization and classification, and all the power available is purchased (including power available at rates above Rs. 4 per kWh), then the average level of load shedding in the peak demand months of October 2006 to March 2007 is estimated to range from 5 hours (in January 2007) to 8 hours (in December 2006). However, hypothetically, in case costly power (above Rs. 4/kWh) is not purchased, then the average load shedding in the peak demand months of October 2006 to March 2007 is

estimated to increase to around 9.5 hours (in October 2006) to 12.25 hours (in December 2006). As a thumb rule, it has been found that every 300 to 320 MW of additional purchase on 'round the clock' basis, enables reduction in load shedding by 1 hour daily across all categories and groups. The projected hours of load shedding for each month from July 06 to March 07, is given in **Annexure 5**.

Thus, increase in power purchase quantum enables MSEDCL to mitigate against load shedding to some extent. However, the tariff will also increase correspondingly, as the cost of power purchase has to be recovered from the consumers. Consumers may need to consider this aspect.

Recently, an innovative approach to the above problem has been successfully implemented in Pune urban circles, where the industrial units having captive facilities are utilising the surplus captive power available during peak hours, resulting in withdrawal of consumption from the grid. The surplus grid power is utilized to eliminate load shedding in the region. The difference in the tariff payable by the industrial units having captive facilities and the actual cost of captive generation is compensated to the captive units; the amount is collected by payment of additional 'Reliability Charges' of around 42 paise/kWh by all consumers for their consumption during the month (except domestic consumers consuming less than 300 units per month).

### **3.2 Operation & Maintenance Expenses**

The Data Formats prescribed by the Hon'ble Commission have defined Operation & Maintenance expenses to comprise the following heads of expenditure, viz.,

- (i) Employee Expenses
- (ii) Administration & General Expenses
- (iii) Repair & Maintenance Expenses

Traditionally, in the MSEB system of accounting, the Repair and Maintenance expenses had the nomenclature of 'Operation and Maintenance' expenses, and have accordingly been treated as 'Operation and Maintenance' expenses in the Tariff Orders issued by the Hon'ble Commission for the erstwhile MSEB for FY 2000-01, FY 2001-02 and FY 2003-04. However, for the sake of this Petition, MSEDCL has considered 'Operation and Maintenance' as defined in the Data Formats prescribed by the Hon'ble Commission.

### 3.2.1 Employee Expenses

The employee expenses comprise the following broad sub-heads of expenditure, viz.,

- Basic salary
- Dearness Allowance
- Overtime
- Other Allowances
- Earned leave encashment
- Staff welfare & others
- Terminal Benefits
  - Provident Fund Contribution
  - Gratuity payment
  - Leave encashment on retirement

#### Basic Salary

The revision of pay scales of employees of the erstwhile MSEB was due from April 1, 2003, though the actual revision was undertaken after an agreement between the Board and the employee unions on 2<sup>nd</sup> June 2005. As per the agreement, the payment of arrears was to be paid in two instalments, viz.,

*“First instalment: A benchmark of monthly repatriation shall be fixed at Rs. 1080 crores (Rs. One thousand eighty crores) w.e.f. June 2005. 50% of the amount repatriated over and above this bench mark upto 31<sup>st</sup> September 2005 shall be earmarked for payment of 1<sup>st</sup> instalment of arrears of pay fixation and paid to the employees in October, 2005. In the same manner 50% of the amount repatriated over and above the bench mark of Rs. 1080 cr during October, 2005 to March, 2006 shall be paid in April 2006.*

*Second instalment: The second instalment shall be payable only after achievement of target of reduction in T&D losses by 3% and average improvement in collection efficiency by 2% in 2006-07 over the corresponding figures of the year 2005-06 or equal to an increase in annual repatriation through increased recovery efforts by Rs. 800 crores.*

*Incentive Allowance: It is also agreed that, In case the actual repatriation exceeds the target of reduction of line losses by 3% and improvement in collection efficiency by 2% or increase in annual repatriation through increased recovery efforts by Rs. 800 Cr., then 10% of the excess repatriation*

*over and above the target set out above shall be earmarked to be paid as 'Incentive allowance'."*

As the specified targets of monthly repatriation have been achieved, the first tranche of the instalment of arrears has been paid in October 2005. The base salary for FY 2004-05 has been considered after including the above provisions on account of the pay revision, and the salary expenses for FY 2005-06 has been projected on this base salary in FY 2004-05.

Considering the above, the basic salary expenses has been projected to increase at a nominal rate of 4% per annum in FY 2005-06 and FY 2006-07, over FY 2004-05 and FY 2005-06 levels, respectively. The rate of increase considered is lower than the prevailing Consumer Price Index (CPI) for industrial workers in India, which is hovering at around 5.5%.

#### **Dearness Allowance**

The Dearness Allowance (DA) paid to the employees is computed as a percentage of the basic salary. In FY 2004-05, the DA was 60% of the basic salary, after considering the impact of the pay revision. The DA is revised every six months and the effective increase in DA works out to 7% of the basic salary, on an annual basis. Hence, the DA has been projected at 67% of the basic salary for FY 2005-06, and at 74% of the basic salary for FY 2006-07.

#### **Overtime and Other allowances**

As a part of the austerity measures, the MSEDCL has stopped payment of Overtime to office staff, and overtime is payable only for the line staff in the field, the incidence of which is also not very high. Accordingly, the overtime payments have been projected to increase at the nominal rate of 4% per annum, in FY 2005-06 and FY 2006-07, over FY 2004-05 and FY 2005-06 levels, respectively. Similarly, the other allowances and staff welfare expenses have also been projected to increase at the nominal rate of 4% per annum, in FY 2005-06 and FY 2006-07.

#### **Terminal Benefits**

The contribution to provident fund has been considered at 12% of the sum of basic salary and DA, as per the normal industry practice. The gratuity payments have been projected to grow at the rate of 5% on the extent of increase in basic salary and DA, over the levels in the previous year. The leave encashment on retirement has been projected to increase at the nominal rate of 4% per annum, in FY 2005-06 and FY 2006-07.

The total employee expenditure to be booked to the revenue account, has been computed by deducting the amount of expense capitalisation, which has been considered as 5%, based on past trends. The summary of employee expenses in the previous year, current year and ensuing year is given in the Table below: (details given in Form 3.1 of Annexure I)

(Rs. Crore)

S.No.	Particulars	Previous Year (FY 2004-05)	Current Year (FY 2005-06)	Ensuing Year (FY 2006-07)
		(Unaudited)	(Estimated)	(Forecast)
1	Basic Salary	524.27	632.60	657.90
2	Dearness Allowance (DA)	316.97	423.84	486.85
3	Earned Leave Encashment	42.83	44.54	46.32
4	Other Allowances	104.08	124.88	129.88
5	Overtime Payment	13.30	13.83	14.39
6	Staff Welfare Expenses & Others	18.42	19.08	19.76
7	<u>Terminal Benefits</u>			
7.1	Provident Fund Contribution	100.55	126.77	137.37
7.2	Gratuity Payment	109.71	116.46	122.28
7.3	Leave Encashment on Retirement	26.97	28.05	29.17
7.4	Others	2.84	2.94	3.06
8	<b>Gross Employee Expenditure</b>	<b>1259.94</b>	<b>1533.00</b>	<b>1646.99</b>
9	Less: Expenses Capitalised	-67.41	-76.65	-82.35
10	<b>Net Employee Expenditure</b>	<b>1192.53</b>	<b>1456.35</b>	<b>1564.64</b>
	<u>Add: Pay Revision Provisions</u>			
11	Basic Salary Provision	84		
12	Dearness Allowance (DA) Provision	51		
13	Other Allowance Provision	16		
14	Provident Fund Contribution Provision	17		
15	<b>Total Pay Revision Provisions</b>	<b>168</b>		

Thus, the total employee expenditure has been projected to increase from Rs. 1360.5 crore in FY 2004-05, to Rs. 1456.4 crore and Rs. 1564.6 crore in FY 2005-06 and FY 2006-07, respectively.

### 3.2.2 Administration & General (A&G) Expenses

The A&G expenses comprise the following broad sub-heads of expenditure, viz.,

- Rent, rates & taxes
- Telephone & postage
- Conveyance & travel
- Electricity charges
- Security arrangements
- Printing & stationery
- Vehicle hiring expenses

- Other expenses, including water charges, professional and consultancy fees, advertisements, vehicle running expenses, office expenses and other miscellaneous expenses

MSEDCL has considered increase in the A&G expenses at a nominal rate of 5% per annum in FY 2005-06 and FY 2006-07, over FY 2004-05 and FY 2005-06 levels, respectively. The rate of increase considered is lower than the prevailing Consumer Price Index (CPI) for industrial workers in India, which is hovering at around 5.5%. The total A&G expenditure to be booked to the revenue account, has been computed by deducting the amount of expense capitalisation, which has been considered as 6%, based on past trends. The summary of A&G expenses in the previous year, current year and ensuing year is given in the Table below: (details given in Form 3.2 of Annexure I)

(Rs. Crore)

S.No.	Particulars	Previous Year (FY 2004-05)	Current Year (FY 2005-06)	Ensuing Year (FY 2006-07)
		(Unaudited)	(Estimated)	(Forecast)
1	Rent, Rates & Taxes	13.67	14.35	15.07
2	Telephone & Postage, etc.	9.94	10.44	10.96
3	Conveyance & Travel	9.22	9.68	10.17
4	Electricity charges	10.90	11.45	12.02
5	Security arrangements	6.25	6.56	6.89
6	Printing & Stationery	6.65	6.98	7.33
7	Vehicle Hiring Expenses	9.89	10.38	10.90
8	Others	62.16	65.27	68.53
<b>9</b>	<b>Gross A&amp;G Expenses</b>	<b>128.68</b>	<b>135.11</b>	<b>141.86</b>
10	Less: Expenses Capitalised	-7.65	-8.11	-8.51
<b>11</b>	<b>Net A&amp;G Expenses</b>	<b>121.03</b>	<b>127.00</b>	<b>133.35</b>

Thus, the total A&G expenditure has been projected to increase from Rs. 121 crore in FY 2004-05, to Rs. 127 crore and Rs. 133.4 crore in FY 2005-06 and FY 2006-07, respectively.

### 3.2.3 Repair & Maintenance (R&M) Expenses

The Hon'ble Commission has been approving R&M expenses equivalent to 3% of opening Gross Fixed Assets (GFA) for the erstwhile MSEB, which was undertaking the activities of generation, transmission, distribution and supply of electricity in the State of Maharashtra. The mix of R&M requirements between the GENCO, TRANSCO and DISCOM, has however, been undertaken in a certain proportion in the past. Thus, the R&M expenses for MSEDCL has been around 3.15% of opening

GFA in FY 2004-05, though the overall level of R&M for the MSEB as a whole has been lower than the level allowed by the Hon'ble Commission, at around 2.7% of opening GFA. The MSEDCL is of the view that the current level of R&M expenditure is on the lower side. Unless MSEDCL increases its expenditure on R&M, its ability to maintain its distribution system at the desired levels is likely to be adversely affected, which will in turn increase the break-downs and transformer failures at the distribution level. Hence, MSEDCL has projected R&M expenses, such that the R&M expenses are 3.15% and 3.5% of opening GFA in FY 2005-06 and FY 2006-07, respectively.

The net R&M expenses are projected to increase from Rs. 266.1 crore in FY 2004-05, to Rs. 282.1 crore in FY 2005-06 and Rs. 347.7 crore in FY 2006-07. The details of R&M expenses in the previous year, current year and ensuing year are given in Form 3.3 of Annexure I.

### **Total Operation & Maintenance (O&M) Expenses**

Thus, the total O&M expenses are projected to increase from Rs. 1747.6 crore in FY 2004-05, to Rs. 1865.5 crore in FY 2005-06 and Rs. 2045.7 crore in FY 2006-07, as shown in the Table below:

(Rs. Crore)

S.No.	Particulars	Previous Year (FY 2004-05) (Unaudited)	Current Year (FY 2005-06) April - March	Ensuing Year (FY 2006-07) (Forecast)
1	Employee Expenses (net of capitalisation)	1360.53	1456.35	1564.64
2	Administration & General Expenses (net of capitalisation)	121.03	127.00	133.35
3	Repair and maintenance (net of capitalisation)	266.08	282.12	347.66
	<b>Total Operation &amp; Maintenance Expenses (net of capitalis</b>	<b>1747.64</b>	<b>1865.48</b>	<b>2045.66</b>

### **3.3 Depreciation Expenditure**

The depreciation is chargeable on straight-line basis on the Gross Fixed Assets (GFA) at the beginning of the year. The Gross Fixed Assets of MSEDCL at the beginning of the year have been taken from the provisional Transfer Scheme notified by the GoM, and made effective from June 5, 2005. The provisional Transfer Scheme gives the details of opening GFA as on April 1, 2005. For the previous year, i.e., FY 2004-05, the accounts of the integrated MSEB have been segregated on the basis of the Trial Balances and allocation of Head Office assets and liabilities, to compute the GFA. For FY 2005-06 and FY 2006-07, the addition to the asset base has been projected after

considering the capital expenditure programme for these years (discussed in a subsequent section), and the proportionate addition to the asset base based on past trends.

Depreciation has been projected accordingly, on the opening GFA in the respective years. MSEDCL has considered the depreciation rate on the basis of the actual depreciation rates for each group of assets as recorded in the books of MSEDCL, which is based on the depreciation rates notified by the Ministry of Power (MoP) vide its circular in 1994. The effective depreciation rate for MSEDCL, which works out to 6.05%, is lower than the overall rate of depreciation of 6.36% approved by the Hon'ble Commission for the erstwhile MSEB in earlier Tariff Orders. Thus, the depreciation expenditure is projected to increase from Rs. 511.4 crore in FY 2004-05, to Rs. 540.7 crore and Rs. 599.2 crore, in FY 2005-06 and FY 2006-07, respectively. The details of depreciation computed in accordance with the Commission's Tariff Regulations have been submitted separately to the Commission, in response to the queries raised by the Commission. The details of Gross Fixed Assets, Accumulated Depreciation, depreciation during the year, and Net Fixed Assets in the previous year, current year and ensuing year is given in Form 4 of Annexure I.

### **3.4 Interest Expenditure**

The interest expenditure has three main components, viz.

- a) Interest on long-term loans
- b) Other interest & finance charges
- c) Working Capital Interest

#### **3.4.1 Interest on long-term loans**

The interest expenditure on account of long-term loans depends on the outstanding loan, repayments, and prevailing interest rates on the outstanding loans. Further, the projected capital expenditure and the funding of the same also has a large bearing on the long-term interest expenditure.

For FY 2004-05, the actual interest expenditure incurred by the erstwhile MSEB has been allocated to the MSEDCL, based on Trial Balances and allocation of assets and liabilities considered for the provisional Transfer Scheme. The outstanding loans in FY 2004-05, include certain Government of Maharashtra (GoM) loans, which has been serviced by the erstwhile MSEB. However, as per the provisional Transfer Scheme, these GoM loans have not been allocated to the Successor Companies including MSEDCL, and have been retained with the residual MSEB Holding Company. Accordingly, the interest expenditure against these GoM loans has not

been considered under MSEDCL, while projecting the interest expenditure for FY 2005-06 and FY 2006-07. However, it should be noted that the existing Transfer Scheme is provisional. If, under any circumstances, the liability of servicing these GoM loans is allocated to the MSEDCL under the provisions of the Final Transfer Scheme, then the MSEDCL reserves the right to approach the Hon'ble Commission for recovering the cost of the same through appropriate tariff measures, at that point in time.

Apart from the reduction in interest expenditure due to removal of GoM loans from the outstanding loans as explained above, the overall interest expenditure and the average interest rate for loans have reduced in the past two to three years, due to strenuous efforts undertaken by the erstwhile MSEB in this regard. MSEB took advantage of the prevailing lower interest rates on loans and replaced its costlier loan liabilities with cheaper funds to the maximum extent possible, thus reducing the average interest rate by around 2% per annum, which has resulted in significant savings in interest costs and which will benefit the consumer through reducing the cost of delivery. The average interest has been reduced from around 13.4% in FY 2001-02, to around 11% in FY 2004-05, and is expected to reduce further to around 8.3% in FY 2005-06 and FY 2006-07.

#### **Projected Capital Expenditure**

The projected capital expenditure is based on the three-year circle-wise Infrastructure Work Plan comprising of capital expenditure and O&M works to improve efficiencies in its distribution system. The details are given in the Chapter on Capital Investment Programme. In addition, there are other projects being taken up under the Special Projects Cell as well as under APDRP schemes. The summary of the Capital Expenditure projected for FY 2006-07 is given in the Table below:

(Rs. Crore)

Sl.	Project Title	Ensuing Year 2006-07
1	DPDC	70.53
2	Agriculture Feeder Separation	225.00
3	Reactive Power Management	235.00
4	High Voltage Distribution System	25.00
5	Demand Side Management	5.00
6	APDRP	238.00

Sl.	Project Title	Ensuing Year 2006-07
7	SPA	92.66
8	PSI	85.95
9	IE	27.56
10	Renovation & Modernization (PFC)	24.00
11	R&M and Maintenance	1027.00
12	New Substations	774.00
	<b>TOTAL</b>	<b>2829.70</b>

Thus, the capital expenditure projected for FY 2006-07 is Rs. 2829.7 crore. The capital expenditure has been assumed to be undertaken at a normative debt:equity ratio of 70:30 in accordance with the MERC (Terms and Conditions of Tariff) Regulations, 2005, notified in August 2005. For the capital expenditure in FY 2006-07, the major portion of the loan is to be sourced from the Rural Electrification Corporation (REC) at an effective interest rate of 9%.

The capitalisation of interest has been projected on the basis of the past trends, which works out to 6.3% of the long-term interest in that year. Accordingly, the net long-term interest has been projected to reduce from Rs. 349 crore in FY 2004-05 to Rs. 180.9 crore in FY 2005-06 and again increase to Rs. 278.7 crore in FY 2006-07. The summary of long-term interest expenses in the previous year, current year and ensuing year is given in the Table below: (details given in Form 5.1 of Annexure I)

(Rs. Crore)

S.no.	Source of Loan	Previous Year (FY 2004-05)	Current Year (FY 2005-06)	Ensuing Year (FY 2006-07)
		(Unaudited)	(Estimated)	(Forecast)
1	GOM	150.34	11.00	22.00
2	CPSU dues	38.37	38.37	35.49
3	Rural Electrification Corporation	154.69	128.96	223.00
4	Power Finance Corporation	13.95	13.75	16.62
5	Nationalised Banks	14.39	0.97	0.28
6	District Co-op Banks	0.63	0.00	0.00
7	MIDC	0.07	0.00	0.00
8	<b>Gross Interest Expenses</b>	<b>372.43</b>	<b>193.04</b>	<b>297.39</b>
9	Less: Expenses Capitalised	-23.46	-12.16	-18.74
10	<b>Net Interest Expenses</b>	<b>348.97</b>	<b>180.88</b>	<b>278.65</b>

### 3.4.2 Other Interest & Finance Charges

The other interest and finance charges comprise the following heads:

- Guarantee fee payable to GoM for long-term loans taken from lenders
- Other Finance Charges (bank charges and commission for remittances)

The guarantee fee has been projected to remain constant at FY 2004-05 levels of Rs. 42 crore, in FY 2005-06 and FY 2006-07 also, while other finance charges have been projected on the basis of 2.5% of the fresh loans being taken in FY 2005-06 and FY 2006-07, at Rs. 20 crore and Rs. 46 crore, respectively. Break-up of these interest and finance charges is given in Form 5 of Annexure I.

### **3.4.3 Working Capital Interest**

Working capital funds are arranged through a combination of sources such as bill discounting, short-term loans from REC and other sources, buyers' line of credit, and cash credit. The quantum of working capital for FY 2005-06 and FY 2006-07 has been projected in accordance with the MERC (Terms and Conditions of Tariff) Regulations, 2005, notified in August 2005. The rate of interest on working capital loans has been considered as 10.25%, which is the Prime Lending Rate (PLR) of State Bank of India. The working capital interest is accordingly projected to increase from Rs. 0.05 crore in FY 2004-05 to Rs. 105.5 crore and Rs. 157.8 crore in FY 2005-06 and FY 2006-07, respectively.

It should be noted that the working capital interest in previous years has been very low as the erstwhile MSEB was managing its receivables and payables in a very tight manner, by delaying payment of bills payable resulting in loss of prompt payment incentives and strained relationships. However, as the Hon'ble Commission's Regulations specifically provides for working capital interest on normative basis, MSEDCL will incur the cost and pay its bills on time, and avail of all prompt payment incentives. Hence, MSEDCL requests the Hon'ble Commission to approve the working capital interest on normative basis as computed by MSEDCL.

### **3.4.4 Interest on Consumers' Security Deposit**

The MSEDCL pays interest on the consumers' security deposit. The consumers' security deposit has been projected to increase by 10% annually in FY 2005-06 and FY 2006-07 over previous year's levels, based on past trends. Accordingly, the interest on the security deposit has been projected on the increased amount of security deposit and is projected to increase from Rs. 54.5 crore in FY 2004-05, to Rs. 88.9 crore and Rs. 97.8 crore in FY 2005-06 and FY 2006-07, respectively.

### Total Interest Expenditure

The total interest expenditure is thus, projected to reduce from Rs. 472.7 crore in FY 2004-05 to Rs. 441.60 crore in FY 2005-06, and increase to Rs. 627.04 crore in FY 2006-07, as given in the Table below:

(Rs. Crore)

S.No.	Particulars	Previous Year (FY 2004-05) (Unaudited)	Current Year (FY 2005-06) (Estimated)	Ensuing Year (FY 2006-07) (Forecast)
1	Long-term Interest	348.97	180.88	278.65
2	Other interest and finance charge	69.11	62.09	88.11
3	Interest on working capital loans	0.05	105.47	157.77
4	Interest on security deposit	54.53	93.16	102.51
	<b>Total</b>	<b>472.66</b>	<b>441.60</b>	<b>627.04</b>

### 3.5 Provisioning for Bad Debts

In every business, and more so, in the electricity supply business, there is a concern about collection of the amounts billed to the consumers. In the recent past, MSEDCL has improved its collection efficiency, and has managed to even collect some of its past arrears, as a result of which the overall collection efficiency has improved significantly. However, MSEDCL has to provision for a certain amount of bad debts, as per prudent accounting practice. This principle has been well accepted by the Hon'ble Commission in the earlier Tariff Orders for the erstwhile MSEB. Accordingly, MSEDCL has made provisions for bad debts at rate of 1.5% of billings for FY 2005-06 and FY 2006-07, which works out to Rs. 220 crore and Rs. 238 crore in FY 2005-06 and FY 2006-07, respectively.

### 3.6 Other Expenses

The other expenses for MSEDCL comprise the expenditure on account of tax on sale of electricity, which is payable at the rate of 4 paise/kWh for every unit sold to industrial and commercial category, interest payable to suppliers, service fee and miscellaneous expenses. Other expenses are estimated to reduce from Rs. 130.2 crore in FY 2004-05 to Rs. 122.3 crore in FY 2005-06, and increase to Rs. 137.4 crore in FY 2006-07, as shown in the Table below:

(Rs. Crore)

S.No.	Particulars	Previous Year (FY 2004-05)	Current Year (FY 2005-06)	Ensuing Year (FY 2006-07)
		(Unaudited)	(Estimates)	(Forecast)
1	Tax on sale of electricity	84.01	87.82	96.67
2	Interest to Suppliers	2.46	2.71	2.98
3	Stamp Duty	0.79	0.87	0.96
4	Service Fee	0.36	1.63	1.69
5	Miscellaneous	42.58	29.23	35.08
6	<b>TOTAL</b>	<b>130.20</b>	<b>122.25</b>	<b>137.37</b>

### 3.7 Income Tax

The erstwhile MSEB was not liable to pay income tax, and was hence neither paying income tax nor recovering the same through tariffs, till FY 2004-05. However, after the formation of separate Companies under the Companies Act, 1956, the successor Companies are liable to pay income tax in FY 2005-06 (from June 6, 2005) and FY 2006-07. The MERC (Terms and Conditions of Tariff) Regulations, 2005, has also considered income tax as a legitimate element of fixed costs to be recovered through the tariffs. The taxable income in case of MSEDCL is the Return on Equity component, which has been discussed in subsequent paragraphs. The income tax liability of MSEDCL in FY 2005-06 and FY 2006-07 has been projected by applying the current effective income tax rate of 33.66% (30% tax, 10% surcharge, and 2% cess thereon) on the projected RoE, which works out to Rs. 108.5 crore and Rs. 160.9 crore in FY 2005-06 and FY 2006-07, respectively.

### 3.8 Transmission Charges paid/payable to MSETCL

For the purposes of this ARR Petition, MSEDCL has assumed that the entire ARR of the MSETCL, which is the notified STU, would be recovered through MSEDCL's ARR. In case the Hon'ble Commission decides that part of MSETCL's ARR should be recovered from other distribution licensees, then MSEDCL's ARR would have to be reduced by a corresponding amount. In this Petition, MSEDCL has assumed that the transmission charges payable to MSETCL would be Rs. 1668.4 crore and Rs. 1854.4 crore in FY 2005-06 and FY 2006-07, respectively.

### 3.9 Contribution To Contingency Reserves

The MERC (Terms and Conditions of Tariff) Regulations, 2005, has provided for contribution to contingency reserves, as a revenue expense, to be computed as 0.25% to 0.5% of opening GFA, as follows:

*“Where the Distribution Licensee has made an appropriation to Contingencies Reserove, a sum not less than 0.25 per cent and not more than 0.5 per cent of the original cost of fixed assets shall be allowed towards such appropriation in the calculation of wheeling charges”*

Accordingly, MSEDCL has projected the contribution to contingency reserves at 0.5% of opening GFA, which works out to Rs. 44.8 Crore and Rs. 49.7 Crore in FY 2005-06 and FY 2006-07, respectively.

### 3.10 Total revenue expenditure

The total revenue expenditure is the summation of the above heads of expenditure, as given in the Table below:

(Rs. Crore)

Sl.	Particulars	Previous Year (FY 2004-05)	Current Year (FY 2005-06)	Ensuing Year (FY 2006-07)
		(Unaudited)	(Estimated)	(Forecast)
1	Power Purchase Expenses	10706.9	12790.4	17358.9
2	Operation & Maintenance Expenses	1747.6	1865.5	2045.7
2.1	Employee Expenses	1360.5	1456.4	1564.6
2.2	Administration & General Expenses	121.0	127.0	133.4
2.3	Repair & Maintenance Expenses	266.1	282.1	347.7
3	Depreciation, including advance against depreciation	511.4	540.7	599.2
4	Interest on Long-term Loan Capital	349.0	180.9	278.7
5	Other Interest & Finance Charges incl. Interest on working capital & consumer security deposits	123.7	260.7	348.4
6	Bad Debts Written off	209.9	219.9	238.1
7	Other Expenses	130.2	122.7	137.4
8	Income Tax	0.0	108.5	160.9
9	Transmission Charges paid to Transmission Licensee	1589.6	1668.4	1854.4
10	Contribution to contingency reserves		44.8	49.7
11	<b>Total Revenue Expenditure</b>	<b>15368.3</b>	<b>17802.5</b>	<b>23071.3</b>

The total revenue expenditure is thus projected to increase from Rs. 15368.3 crore in FY 2004-05, to Rs. 17802.5 crore and Rs. 23071.3 crore in FY 2005-06 and FY 2006-07, respectively.

### 3.11 Return On Equity

The erstwhile MSEB was entitled to earn a surplus of 4.5% of its Net Fixed Assets, after meeting all its expenses, in accordance with the provisions of S.59 of the erstwhile Electricity (Supply) Act, 1948. The MSEDCL was created under the provisions of the provisional Transfer Scheme as discussed earlier, which was made effective from June 5, 2005. Accordingly, for FY 2004-05 and FY 2005-06, MSEDCL has projected return on the basis of 4.5% of its Net Fixed Assets.

For FY 2006-07, MSEDCL has projected proportionate return on equity (RoE) at the rate of 16% on the opening equity at the beginning of the year and 50% of the equity portion (30%) of the projected capital investment, in accordance with the MERC (Terms and Conditions of Tariff) Regulations, which states,

*"The Distribution Licensee shall be allowed a return at the rate of 16 per cent per annum, in Indian Rupee terms, on the amount of approved equity capital:*

...

*Explanation II – for the purpose of this Regulation, the amount of equity capital as at April 1, 2005 shall be computed as follows:*

...

*Provided that in case of a Distribution Licensee formed as a result of a transfer scheme under Section 131 of the Act, the date of the said transfer scheme shall be the effective date instead of April 1, 2004 for determination of equity capital above."*

...

*The amount of equity capital at the commencement of each financial year thereafter shall be computed as follows:*

*Equity capital as at the commencement of the previous financial year, calculated in accordance with these Regulations, plus*

*Equity capital portion of the allowable capital cost, for the investments put to use in distribution business, calculated in accordance with Regulation 72 and Regulation 73 above, for the previous financial year.*

...

*The return on equity capital shall be computed in the following manner:*

*(a) Return at the allowable rate as per Regulation 76.1.1 above, applied on the amount of equity capital at the commencement of the financial year; plus (b) Return at the allowable rate*

as per Regulation 76.1.1 above, applied on 50 per cent of the equity capital portion of the annual allowable capital cost, for the investments put to use in distribution business, calculated in accordance with Regulation 72 and Regulation 73 above, for such financial year."

The summary of Return on Equity in the previous year, current year and ensuing year is given in the Table below: (details given in Form 8 of Annexure I)

(Rs. Crore)

Sl.	Particulars	Previous Year (FY 2004-05) (Unaudited)	Current Year (FY 2005-06) (Estimated)	Ensuing Year (FY 2006-07) (Forecast)
1	Surplus @ 4.5% of NFA	122.5	129.0	
2	Return on Equity @16%			478.0

### 3.12 Non-tariff Income

MSEDCL has certain sources of non-tariff income, mainly interest on delayed payment, delayed payment charges, and other miscellaneous receipts, which have been projected based on past trends. The summary of Non-tariff income in the previous year, current year and ensuing year is given in the Table below: (details given in Form 9 of Annexure I)

(Rs. Crore)

S.No.	Particulars	Previous Year (FY 2004-05)	Current Year (FY 2005-06)	Ensuing Year (FY 2006-07)
		(Unaudited)	(Estimates)	(Forecast)
1	Other/Miscellaneous receipts	241.95	241.95	241.95
2	Interest on Other Investments	26.46	26.46	26.46
3	Delayed Payment Charges	90.20	94.71	99.45
4	Interest on Delayed Payment	611.89	642.48	674.61
5	Recovery from theft of power	13.99	14.69	15.42
6	Interest on staff loans & Advances	1.45	1.45	1.45
7	Interest on advances to suppliers	0.00	0.02	0.02
	<b>Total</b>	<b>985.94</b>	<b>1021.76</b>	<b>1059.36</b>

Here, MSEDCL submits that the delayed payment charges and the interest on delayed payment appear to be high, as they are accounted for on accrual basis. However, these amounts are rarely recovered, and hence these amounts only serve to reduce the ARR of MSEDCL and are not sources of income in the real sense. MSEDCL requests the Hon'ble Commission to take a realistic view in this matter and project the income from these sources accordingly.

### 3.13 Aggregate Revenue Requirement

The Aggregate Revenue Requirement (ARR), which is the summation of the total revenue expenditure and the RoE, is thus projected to increase from Rs. 14505 crore in FY 2004-05, to Rs. 16910 crore and Rs. 22490 crore in FY 2005-06 and FY 2006-07, respectively, as given in the Table below: (details given in Form 1 of Annexure I).

(Rs. Crore)

Sl.	Particulars	Previous Year (FY 2004-05)	Current Year (FY 2005-06)	Ensuing Year (FY 2006-07)
		(Unaudited)	(Estimated)	(Forecast)
1	Total Revenue Expenditure	15368.3	17802.5	23071.3
2	Return on Equity Capital	122.5	129.0	478.0
3	Aggregate Revenue Requirement	15490.8	17931.5	23549.3
4	Less: Non Tariff Income	985.9	1021.8	1059.4
5	Aggregate Revenue Requirement from Retail Tariff	14504.9	16909.8	22489.9

#### **4 MSEDCL'S REVENUE GAP WITH EXISTING TARIFF**

The Revenue Gap is the difference between the Aggregate Revenue Requirement (ARR) as discussed in the earlier Section, and the revenue with the existing tariff.

The category-wise and consumption slab-wise consumption and connected load/contract demand particulars have been multiplied with the prevailing fixed and energy charges to determine the projected revenue in FY 2005-06 and FY 2006-07 at the prevailing tariffs. The prevailing rebates and penalties have been included in the revenue calculations. The State Government subsidy has not been considered in FY 2005-06 and FY 2006-07, as there is no assurance that the State Government will provide the subsidy.

The revenue from existing tariffs in FY 2006-07 has now been revised to consider the impact of the prevailing FAC of 96 paise/kWh. Also, the revenue in FY 2005-06 has increased due to the Commission's approval of levy of FAC over and above the FAC cap for the period October 2005 to March 2006. The FAC has been merged with the energy charges in the proposed tariffs, in line with the principles adopted by the Commission in previous Tariff Orders.

The details of the projected category-wise revenue in FY 2004-05, FY 2005-06 and FY 2006-07, have been shown in Form 12 in Annexure 1, which also gives the calculation of the revenue. The projected revenue and corresponding revenue gap with the existing tariff have been summarised in the Table below:

(Rs. Crore)

Sl.	Particulars	Previous Year	Current Year	Ensuing Year
		(FY 2004-05) (Unaudited)	(FY 2005-06) (Estimated)	(FY 2006-07) (Forecast)
1	Aggregate Revenue Requirement from Retail Tariff	14504.9	16909.8	22489.9
2	Revenue with existing tariff	13991.8	15508.6	18942.2
3	Revenue Gap	513.1	1401.2	3547.8

Thus, the revenue gap has been projected as Rs. 1401.2 crore and Rs. 3547.8 crore, in FY 2005-06 and FY 2006-07, respectively.

## **5 MSEDCL'S CAPITAL EXPENDITURE PLAN**

### **5.1 Background**

As mentioned earlier, MSEDCL has prepared a circle wise Infrastructure Work Plan (IWP) to improve efficiencies in its distribution system. The Infrastructure Work Plan has been prepared by proactive distribution planning of load and infrastructure at the SDO (O&M Subdivision) level. Each SDO has prepared a five-year load profile and infrastructure requirement to match that load profile. It is proposed to review the Plan every 2 years to factor in changes in the load profile/requirements. MSEDCL believes that this "bottom-up" approach will ensure that the load growth is anticipated and adequate infrastructure is created to match this load growth in a holistic manner.

The broad objectives of the Infrastructure Work Plan are to bring about efficiencies by reducing AT&C losses, upgradation of the distribution system and providing reliable quality of supply. The main objective of the infrastructure plan is to provide reliable and Quality supply of power to comply with the guidelines specified in the National Electricity Plan & Standard of Performance Regulations. Further plan is aimed at meeting the Load Growth demand of next 5 years. In the first phase, plan has been prepared for 06-07 and 07-08 and is planned to be implemented in three years.

For effective implementation, Main PMC at Corporate office and PMC's at Zonal offices have been appointed. This will result in the control of the Distribution Losses that will result in the efficient utilization of the distribution system and decrease in the energy inputs and increase in the revenue. The healthy reactive compensation in the distribution network would essentially aid the utility efforts to reduce the high Distribution losses. The reduction in Distribution Loss is targeted through re-conductoring of lines, introduction of HVDS and LTLMS that will reduce the I<sup>2</sup>R Technical Loss. The Reactive Power Management Plan will be undertaken by MSEDCL for improvement in the power factor and also decrease the loading of equipment that will ultimately result in reduction of energy Input. After the

implementation of the Infrastructure plan Work, the power factor is targeted to reach 0.90, 0.95 and 0.99 in Rural areas, Urban Areas and Industrial Areas, respectively by installing the capacitors.

The proposed Infrastructure plan is divided into 2 parts, i.e., Capital Work Plan and Renovation & Modernisation Works Plan.

**Capital Work Plan** is related to upgradation and addition to the existing infrastructure to meet the load growth and to install the latest technology to improve the efficiency. The major activities planned in the Capital Work Plan are related to establishment of 33/11kV S/s, 22/11kV S/s, switching S/s, distribution transformers of various capacities, i.e., 630, 500, 315, 300, 200, 100, 25, 16 kVA, etc., erection of 33kV, 22kV, 11kV lines, LT single phase 2 wires, single phase 3 wires, three phase 4 wires, installation of capacitor, augmentation of substation & capacity addition by new power transformers, SCADA, call centres, HVDS, DTC Metering, etc. The details of each scheme under Capital Work Plan and the related expenditure are given in **Annexure 3**.

**R&M Work Plan** includes re-conductoring of lines, conversion of overhead wire to underground wire, revamping of sub-stations (Indoor to Outdoor Sub-Stations), replacement of old CT's, PT's, battery sets, battery charger, deteriorated structures such as poles, stays, crimping of jumpers, etc. which will reduce interruptions and thus help in achieving the Standard of Performance. The details of each scheme under R&M Work Plan and the related expenditure are given in **Annexure 4**.

The total cost of the specified Infrastructure plan for achieving the objective of the plan is Rs. 14,524 Crore, over the three-year period from FY 2006-07 to FY 2008-09, as given below: (Rs. Crore)

Year	Capital Works Plan	R&M Works Plan	Total
FY 06-07	774	1027	1801
FY 07-08	4343	2000	6343
FY 08-09	4343	2037	6380
<b>Total</b>	<b>9460</b>	<b>5064</b>	<b>14524</b>

In addition, there are other projects being taken up under the Special Projects Cell as well as under APDRP schemes, as shown below:

Sl.	PROJECTS UNDER SPECIAL PROJECTS CELL	CAPITAL EXPENDITURE FY 2006-07
1	Gaothan Feeder Separation Scheme	225
2	Low Tension Load Management Scheme	100
3	Fixed Capacitors.	10
	<b>Total</b>	<b>335</b>

MSEDCL would like the Hon'ble Commission to note that it has not included the Single Phasing Scheme in the proposed capital expenditure, as the Hon'ble Commission has not approved the same. However, MSEDCL is going ahead with the implementation of the scheme and has been submitting the status reports of the progress of implementation to the Hon'ble Commission. The Hon'ble Commission has also been considering the benefit in terms of load relief, while formulating the principles and protocol for load shedding. Hence, MSEDCL requests the Hon'ble Commission to kindly reconsider its decision and allow this expenditure to be recovered through the ARR.

MSEDCL has thus, considered total capital expenditure of Rs 2829.70 Crore in FY 2006-07, as given below:

**Table - Proposed Capital Expenditure of MSEDCL**

Sl.	Project Title	Ensuing Year 2006-07
1	DPDC	70.53
2	Agriculture Feeder Separation	225.00
3	Reactive Power Management	235.00
4	High Voltage Distribution System	25.00
5	Demand Side Management	5.00
6	APDRP	238.00
7	SPA	92.66
8	PSI	85.95

Sl.	Project Title	Ensuing Year 2006-07
9	IE	27.56
10	Renovation & Modernization (PFC)	24.00
11	R&M and Maintenance	1027.00
12	New Substations	774.00
		<b>2829.70</b>

In the past, under the erstwhile MSEB, the level of capital investment on an annual basis was much lower. The actual capitalisation during FY 2004-05 and FY 2005-06, as given in Form 4 of Annexure 1, which gives the details of assets and depreciation. The actual addition to fixed assets during FY 2004-05 and FY 2005-06 is Rs. 509.73 crore and Rs. 965.31 crore, respectively. However, during FY 2006-07, MSEDCL proposes to complete the entire investment during FY 2006-07, and all the assets will be completed, hence the entire capital expenditure would be capitalised at the end of the year. MSEDCL is quite confident of achieving the higher level of capital expenditure, due to the following reasons:

- Orders for material have already been placed for a significant portion of the material requirement.
- The entire Work Plan is being undertaken under the turnkey Project Management Consultant (PMC) route, appointed through tendering process
- LoIs have been issued on July 10, 2006 to the PMCs
- The process of selection of Contractors is proceeding as per schedule
- The Contracts of PMC have proviso for penalty/incentive clause of Rs. 25000 per day of delay/early completion, upto a ceiling of Rs. 5 lakh
- The finance for the entire capital expenditure during FY 2006-07 has already been fully tied up

MSEDCL has been submitting Detailed Project Reports for all the schemes in excess of Rs 10 Crore as per the requirements of the MERC (Terms and Conditions of Tariff) Regulations, 2005, giving detailed cost benefit analysis of each scheme.

## **6 TARIFF PHILOSOPHY AND PROPOSED TARIFF**

### **6.1 Average Cost of Supply**

The average cost of supply in FY 2006-07 works out to Rs. 4.22 per kWh, considering the ARR of Rs. 22490 crore, and total sales of 53254 MU.

### **6.2 Truing up of Revenue Gap in FY 2004-05 and FY 2005-06**

As discussed above, the total revenue gap over the three years, is Rs. 5462 crore, including the truing up requirement of FY 2004-05 and FY 2005-06. This is in accordance with the principle of 'truing up' instituted by the Commission in its Tariff Orders for TPC and REL in FY 2004-05. As tariff has not been revised for over two and a half years, the revenue gap in FY 2004-05 and FY 2005-06 has to also be recovered from the tariff revision to be undertaken in FY 2006-07.

### **6.3 Need for tariff increase**

The revenue gap shown above has to be recovered through increase in the retail tariffs for MSEDCL's consumers. In subsequent sections, MSEDCL has proposed category-wise tariffs, in accordance with the tariff philosophy outlined in this Petition.

The tariffs have not been revised since December 2003, when the Commission issued the previous Tariff Order for the erstwhile MSEB for FY 2003-04. Thus, the existing tariffs have been in existence since December 2003, which is around 2.5 years.

The Fuel and Other Cost Adjustment (FOCA)/Fuel Cost Adjustment (FCA) formula helped MSEB/MSEDCL to recover most of the increase in fuel costs over this period. However, fixed costs have also gone up significantly over this period, as detailed in the ARR Petition submitted to the Commission in February 2006. This is clearly brought out by the fact that the average cost of supply (ACOS) has increased from Rs. 3.07 per kWh (computed based on ARR, less the non-tariff income, and the total sales approved by the Commission in the Tariff Order for FY 2003-04) to Rs. 4.22 per kWh.

The above discussion clearly shows that unless, tariff is increased, the viability of MSEDCL will be adversely affected. The Commission and MSEDCL's consumers will appreciate that MSEDCL has to be financially viable, in order to procure more electricity, to reduce the load shedding in the State.

The average increase in tariff required over existing levels to recover the entire revenue gap works out to 27%, if only the impact of RGPPL is considered. However, if all the elements contributing to the increase in ARR and the revenue gap are considered, as discussed above, then the average increase in tariff works out to 28.8%. It should be noted the increase in tariff on an annualised basis works out to around 10%, as the tariffs have not been revised for around 2.5 years.

#### **6.4 Treatment of revenue from RLC Charges**

The Commission, in its Tariff Order for FY 2003-04, had introduced Regulatory Liability Charges for selected consumer categories, and had stated as under:

*“As regards the Regulatory Liability, the Commission is of the opinion that only subsidizing consumers should contribute to the Regulatory Liability, which would have to be returned by the MSEB in future. Hence, the Regulatory Liability Charge (RLC) has been designed such that all the subsidizing categories contribute the same amount of RLC to keep the MSEB afloat. Subsidized categories cannot be expected to contribute to the Regulatory Liability as they have yet to move towards the average cost of supply. Thus, for subsidizing categories, a separate component of tariff has been shown as ‘Regulatory Liability Charge’ which will be used by the MSEB for funding the cost of the excess T&D losses, which will be returned to these consumer categories in future through tariffs.*

...

*.The average rate of contribution works out to 50 paise per unit for the subsidizing categories, viz. LT commercial, LTPG, HTP I, HTP II and Railways.*

*In future, when the T&D losses are reduced, then the RLC will be returned to these consumer categories through reduction in tariffs. The Commission clarifies that the contribution through RLC will not be recorded and maintained separately for each individual consumer and the category as a whole is expected to get the contribution back.”*

MSEDCL accepts that the revenue earned from RLC has to be refunded to the consumers, at some point in time in the future. However, MSEDCL has faced a revenue gap in FY 2004-05 and FY 2005-06, despite earning revenue from RLC. If the revenue from RLC is refunded, the revenue gap will increase correspondingly, which will have to be recovered from all consumers.

Further, though distribution losses have been reduced in FY 2005-06 as compared to the loss levels in FY 2004-05, revenue from RLC can be returned only out of savings

due to higher loss reduction as compared to target loss reduction. Since, the loss levels are still above the target loss levels stipulated by the Commission, it is not possible to refund the revenue earned from RLC at this stage. In the context, MSEDCL would like to bring to the notice of the Commission, the stipulation of the National Tariff Policy (NTP), in the context of targets for Multi-year tariff (MYT) which states,

*"In cases where operations have been much below the norms for many previous years the initial starting point in determining the revenue requirement and the improvement trajectories should be recognized at "relaxed" levels and not the "desired" levels. Suitable benchmarking studies may be conducted to establish the "desired" performance standards."*

Hence, MSEDCL does not propose to refund the revenue earned from RLC in FY 2004-05 and FY 2005-06, at this point in time. For FY 2006-07, RLC has been merged with the energy charges, in the proposed tariffs.

## **6.5 Tariff Philosophy**

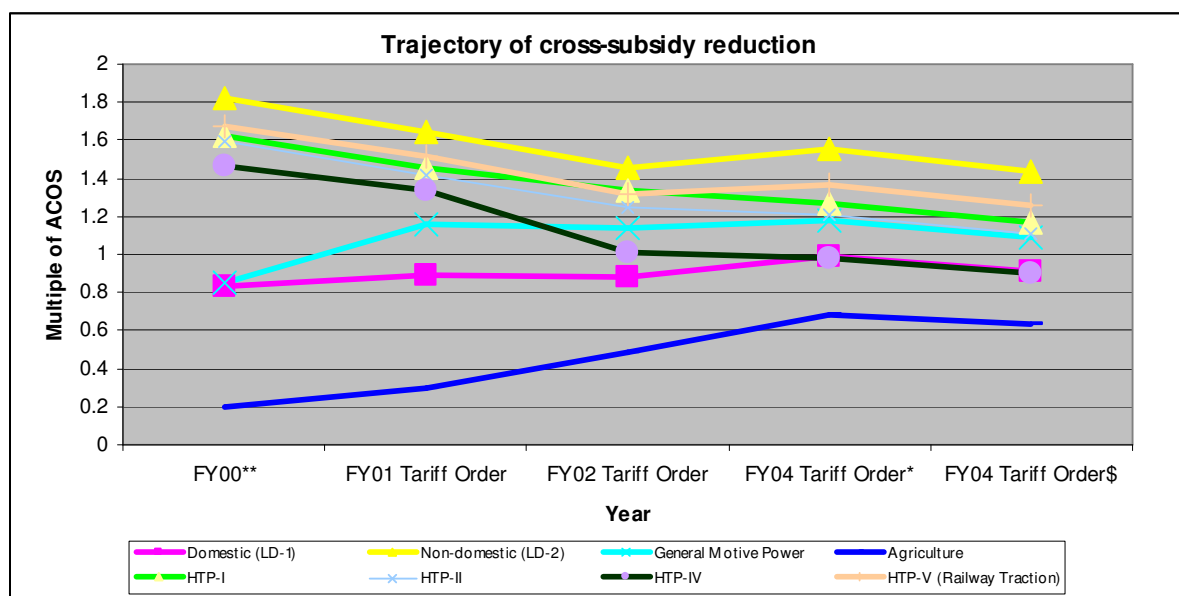
### **6.5.1 Cross-subsidy reduction**

Since the first Tariff Order for the erstwhile MSEDCL in May 2000, the Commission has been reducing the cross-subsidy between the subsidising and subsidised consumer categories. Till date, the Commission has issued three Tariff Orders for the erstwhile MSEDCL, and the cross-subsidy has been reduced further in each Tariff Order. MSEDCL is of the view that as compared to other States, the trajectory of cross-subsidy reduction in Maharashtra has been too steep, i.e., the differential between tariff of subsidising categories and tariff for subsidised categories has been reduced at a pace that is more rapid than desirable. The following Table and graph presents the trajectory of cross-subsidy reduction in the State, which clearly shows that the cross-subsidy reduction in the State has been very aggressive.

Category	Ratio of Average Realisation to Average Cost of Supply (%)				
	FY00**	FY01 Tariff Order	FY02 Tariff Order	FY04 Tariff Order*	FY04 Tariff Order\$
<b>LT Category</b>					
Domestic (LD-1)	83%	89%	88%	99%	91%
Non-domestic (LD-2)	182%	164%	146%	156%	144%
General Motive Power	85%	116%	114%	118%	108%
Public Water Works					
<i>Urban PWW</i>	81%	81%	90%	100%	92%
<i>Rural PWW</i>	15%	27%	32%	55%	50%
Agriculture	20%	30%	48%	69%	63%
Street Lighting	63%	77%	94%	85%	78%
<b>Sub Total LT</b>	<b>59%</b>	<b>71%</b>	<b>80%</b>	<b>95%</b>	<b>88%</b>
<b>HT Category</b>					
HTP-I	162%	146%	134%	127%	117%
HTP-II	159%	142%	125%	120%	111%
HTP-III	157%	144%	101%	98%	91%
HTP-IV	147%	134%	101%	98%	91%
HTP-V (Railway Traction)	167%	151%	132%	136%	126%
HTP-VI	123%	118%	90%	94%	86%
HTP-VII (Agriculture)	18%	22%	31%	50%	46%
Mula Pravara	19%	43%	64%	73%	68%
<b>Sub Total HT</b>	<b>154%</b>	<b>140%</b>	<b>128%</b>	<b>128%</b>	<b>118%</b>

**Notes:**

- a) For FY 1999-00, the ACOS has been considered equal to the average realisation, as the Tariff Order does not give details of the ACOS for this year
- b) \*\* - Prior to first Tariff Order of the Commission
- c) \* - Including RLC charges, and considering ACOS as Rs. 2.83 per kWh
- d) \$ - Including RLC charges, and considering ACOS as Rs. 3.07 per kWh



**Figure:** Trajectory of reduction of cross-subsidy for selected categories

In this context, the NTP states,

*“For achieving the objective that the tariff progressively reflects the cost of supply of electricity, the SERC would notify roadmap within six months with a target that latest by the end of year 2010-2011 tariffs are within  $\pm 20$  % of the **average cost of supply**. The road map would also have intermediate milestones, based on the approach of a gradual reduction in cross subsidy.” (emphasis added)*

The above stipulation in the NTP clearly allows more time for the States to reduce the cross-subsidy in the State, and MSEDCL believes that the trajectory of cross-subsidy reduction needs to be revisited and stipulated afresh by the Commission, keeping in mind the basic objective that no consumer category is subjected to a tariff shock, to the extent possible.

MSEDCL has prepared a comparison of retail tariffs across selected comparable States, in order to give an idea of the position of the State, in the context of cross-subsidy reduction and difference in category-wise tariffs. The comparison shows that the cross-subsidy in the State is one of the lowest, as given below:

**Table: Comparison of LT tariffs (Average rate of electricity in December 2005)**  
(paise/kWh)

Sl. No.	Name of Utility	Tariff effective from	Domestic 1 KW (100 KWh/ Month)	Domestic 4 KW (400 KWh/ Month)	Commercial 2 KW (300 KWh/Month)	Commercial 10 KW (1500 KWh/ Month)	Agriculture 5 HP (1000 kWh/ month)
1	Andhra Pradesh	1/4/2005	238.5	396.63	599.33	624.67	52
2	Gujarat	25-06-2004	391.84U ,276.29R	516.46U, 382.44R	589.61	626.47	57.75
3	Haryana	15-08-3004	333	379.25	429	429	
4	Karnataka (Bangalore Metro Area)	10/10/2005	292.43	418.3	637.88	651.18	
	(Other Areas)		281.93	402.55	630.87	644.18	
5	Madhya Pradesh	15-07-2005	337.3	424.64	538.3	539.59	132.5
	Maharashtra(Existing )-Tariff Order	1/11/2003	329.16	367.95	476.65	530.13	75
6	Maharashtra(Existing )- Actual FAC		376.5	411.1	501	545	180
	Maharashtra(Proposed)		476	519	640	704	180
7	Punjab	1/10/2004	210.00U ,189.00R	320.51U ,288.47R	403.2	403.2	Free
8	Tamil Nadu	16-06-2004	120	216.25	610.75	609.35	Free

Source: Infraline Database

**Table: Comparison of HT tariffs (Average rate of electricity in December 2005)**  
(paise/kWh)

Sl. No.	Name of Utility	Tariff effective from	Small Industry 10KW (1500 KWh/ Month)	Medium Industry 50KW (7500 KWh/ Month)	Large Industry 1000KW 60% L.F. (438000 KWh/Month)	Heavy Industry 10000KW 60% L.F. (4380000 KWh/ Month)	Railway Traction
1	Andhra Pradesh	1/4/2005	415.4	414.33	391.75	431.2	440.03
2	Gujarat	25-06-2004	450.02	465.81	518.63	557.35	549.12 at 132KV
3	Haryana	15-08-2004	438	438	419	419	444.29 at 11KV
4	Karnataka Bangalore Metro (Area)	10/10/2005	418.4	521.47	490.28	501.07	485.88
	(Other Areas)		413.71	512.08	487.46	498.25	485.88
5	Madhya Pradesh	15-07-2005	396.13	483.61	474.48	469	473.33 at 132/220KV
6	Maharashtra -Existing tariff (Infraline Source)	1/12/2003	254.9	254.9	399.55 B	399.55 B	385
					388.57 O	388.57 O	
	Maharashtra(Existing )-with FAC of 96 paise/kWh		408	408	428 B	428 B	481
					425 O	425 O	
	Maharashtra -Proposed Tariff		539	539	559 B	559 B	610
					551 O	551 O	
7	Punjab	1/10/2004	321.3	353.85	353.85	353.85	402 at 132KV
8	Tamil Nada	16-06-2004	458.85	486.57	452.11	462.61	526.47

Source: Infraline Database

The above comparison highlights the difference in tariff between consumer categories as well as the difference in absolute effective tariff in different States. As the above Tables show, the differential in tariff between subsidising and subsidised categories is amongst the lowest in Maharashtra, and the industrial tariffs is amongst the lowest in the country, across comparable States.

Hence, MSEDCL has not proposed any significant reduction in cross-subsidy, and in some cases, the cross-subsidy may increase. The movement of the cross-subsidy has been shown in the Table below:

Category	Ratio of Average Realisation to Average Cost of Supply (%)		
	FY04 Tariff Order	Existing levels	Proposed Tariff
Domestic (LD-1)	91%	59%	113%
Non-domestic (LD-2)	144%	129%	163%
General Motive Power	108%	100%	131%
Agriculture	63%	54%	40%
Street Lighting	78%	106%	105%
HTP-I & HTP-II	117%	105%	146%
HTP-III & IV	91%	88%	117%

It should be noted that the FY04 Tariff Order cross-subsidy levels have been recomputed on the basis of the average cost of supply based on ARR approved by the Commission in the Tariff Order for FY 2003-04. Also, the cross-subsidy levels under proposed tariffs are higher, as it includes the impact of recovery of the trueing up requirement for FY 2004-05 and FY 2005-06.

### 6.5.2 Average Cost of Supply vs. Cost to Serve

Though, the Commission has in the past indicated that category-wise cost to serve needs to be considered for the purpose of tariff determination, the computation of category-wise cost to serve necessitates the use of several assumptions, which could lead to unreliable results. The NTP also clearly gives the direction that the tariffs are to be determined in relation to the average cost of supply, as highlighted above. Hence, MSEDCL has proposed the tariffs in relation to the average cost of supply, in line with the practice followed in the past.

### 6.5.3 Time of Day (ToD) tariffs

The Commission had introduced ToD tariffs for the HT categories, and further increased the differential between peak and off-peak tariffs, in order to maximise the shift in consumption from peak hours to off-peak hours. This strategy had succeeded to a large extent, and the load curve had flattened significantly over the years.

Peak hour power is costlier than off-peak power, and availability of power during peak hours is also scarce. The Commission will appreciate that the load curve has flattened and is also shifting to the hours where power is made available, due to the load shedding being undertaken.

In order to maintain the load curve at current levels, it is essential to increase the differential between the off-peak and peak hour tariffs for HT categories. Accordingly, it is proposed that the differential between off-peak and peak hour tariffs be increased, and kept at same levels for HT industrial categories (HTP-I and HTP-II) as well as HT Water Works (HTP-III and HTP-IV), as shown in the Table below:

Sl.	Consumer Category & time slot	Existing ToD tariff (w.r.t. base tariff)	Proposed ToD tariff (w.r.t. base tariff)
1	<b>HTP-I and HTP-II</b>		
	2200 hrs - 0600 hrs	-85	-50
	0600 hrs - 0900 hrs & 1200 - 1800 hrs	0	0
	0900 hrs - 1200 hrs	60	110
	1800 hrs - 2200 hrs	100	180

Sl.	Consumer Category & time slot	Existing ToD tariff (w.r.t. base tariff)	Proposed ToD tariff (w.r.t. base tariff)
<b>2</b>	<b>HTP-III and HTP-IV</b>		
	2200 hrs - 0600 hrs	-85	-50
	0600 hrs - 0900 hrs & 1200 - 1800 hrs	0	0
	0900 hrs - 1200 hrs	60	110
	1800 hrs - 2200 hrs	100	180

MSEDCL also proposes to install ToD meters for all consumers with connected load above 10 kW (except domestic consumers), in order to facilitate further flattening of the load curve. MSEDCL proposes to introduce ToD tariffs for these consumers, with lesser differential between peak and off-peak hours, in line with the Commission's philosophy of introducing ToD tariffs with lesser differential and then increasing the differential. The ToD tariffs proposed for such consumers are:

Sl.	Consumer Category & time slot	Proposed ToD tariff (w.r.t. base tariff)
<b>1</b>	<b>Consumers with connected load above 10 kW</b>	
	2200 hrs - 0600 hrs	-50
	0600 hrs - 0900 hrs & 1200 - 1800 hrs	0
	0900 hrs - 1200 hrs	50
	1800 hrs - 2200 hrs	100

#### 6.5.4 Optional LTMD tariff for LT Industrial Category

The Commission had introduced optional MD based tariff for LT industrial category in its second Tariff Order. It is now over 4 years since the optional LTMD tariff was introduced. MSEDCL is of the view that the optional element should be removed, and all LT industrial consumers should be shifted to a MD based tariff regime, as contract demand is a better parameter as compared to connected load and is measured accurately also. Hence, MSEDCL proposes that MD based tariff should be made mandatory for LT industrial category.

### **6.5.5 Increase in recovery from fixed charges**

Of the total Annual Revenue Requirement (ARR) of MSEDCL, around 42% of the expenses, including fixed costs of power purchase, are fixed in nature. The recovery of fixed costs from fixed charges through the existing tariffs is around 46%. The Commission, in its earlier Tariff Orders, had indicated that the recovery of fixed costs from fixed charges would be gradually increased. Also, in case of The Tata Power Company (TPC), the Commission has determined the recovery of fixed costs from fixed charges at much higher levels, at around 88%. Hence, there is a need to increase the recovery of fixed costs from fixed charges, and MSEDCL proposes to increase the recovery of fixed costs from fixed charges to around 60%.

### **6.5.6 Rationalisation of categories and consumption slabs**

The Commission has rationalised the tariff categories and consumption slabs to a great extent in previous Tariff Orders, hence, MSEDCL has not proposed any further rationalisation of the tariff categories and consumption slabs.

### **6.5.7 Levy of Voltage Surcharge**

MSEDCL has filed a separate Petition for levy of a voltage surcharge on consumers who are supplied at lower voltage than the prescribed voltage as per MERC (Standards of Performance) Regulations. The Petition filed by MSEDCL has the following prayers, inter-alia:

- a) *"It is proposed to levy surcharge of additional 15% on the energy charges on all such consumers (existing as well as prospective) availing supply at a lower voltage level than stipulated.*
- b) *Permit MSEDCL to enhancement the load for the existing consumers upto 10 MVA at a lower voltage level.*
- c) *Permit MSEDCL to release load of prospective consumers above 10 MVA at voltage level lower than specified with prior approval of Hon'ble Commission."*

The Commission may kindly consider incorporation of this provision in the revised tariff.

### 6.5.8 Overall philosophy

Based on the above philosophy, MSEDCL proposes to increase the tariff for most categories (except agricultural category) by the average tariff increase required, equivalent to 28.8%, with some modifications. The industrial tariff is proposed to be increased further, to make up for the gap in revenue due to non-increase of agricultural tariff. The tariffs have been proposed, assuming that the existing FAC of 96 paise/kWh will continue to be levied to the consumers.

## 7 PROPOSED CATEGORY-WISE TARIFFS

Based on the tariff philosophy and approach outlined above, MSEDCL has proposed the following tariffs for each of its consumer categories. The existing and proposed tariffs for each consumer category have been detailed, with elaboration as and when necessary.

### 7.1.1 LT Categories

#### 7.1.2 LD 1 - Domestic

Sub-category & Consumption Slab	Existing				Proposed	
	Fixed Charges (Rs/mth)	Energy Charge (paise/ kWh)	Regulatory Liability Charge (paise/ kWh)	FAC (paise/ kWh)	Fixed Charges (Rs/mth)	Energy Charge (paise/kWh)
0 - 30 units	20	125		96	25	265
31 - 300 units	40	290		96	60	480
Above 300 units	40	400		96	60	640
Fixed charge for 3-phase consumers	100				200	
Addl. Fixed Charge for connected load above 10 kW	Rs. 100 per 10 kW or part thereof above 10 kW				200 per 10 kW or part thereof above 10 kW	

The effective increase in tariff has been proposed at 27%, such that the impact on the lower consumption slabs is lower than that for the higher consumption slabs, in accordance with the principle of encouraging load regulation by the consumers.

### 7.1.3 LD-2 Non Domestic

Sub-category & Consumption Slab	Existing				Proposed	
	Fixed Charges (Rs/mth)	Energy Charge (paise/ kWh)	Regulatory Liability Charge (paise/ kWh)	FAC (paise/ kWh)	Fixed Charges (Rs/mth)	Energy Charge (paise/kWh)
0 - 100 units	100	240	50	96	100	500
101 - 200 units	100	315	50	96	100	600
Above 200 units	100	410	50	96	100	720
Fixed charge for 3-phase consumers	150				250	
Addl. Fixed Charge for connected load above 10 kW	Rs. 150 per 10 kW or part thereof above 10 kW				400 per 10 kW or part thereof above 10 kW	
Optional MD tariff	Rs. 220/ kVA/ mth				Rs. 220/ kVA/mth	

### 7.1.4 LTPG - General Motive Power and Power loom

Sub-category & Consumption Slab	Existing				Proposed	
	Fixed Charges (Rs/HP/ mth)	Energy Charge (paise/ kWh)	Regulatory Liability Charge (paise/ kWh)	FAC (paise/ kWh)	Fixed Charges (Rs/HP/ mth)	Energy Charge (paise/kWh)
0 - 1000 units	60	230	50	96	100	480
Above 1000 units	60	250	50	96	100	510
Optional MD tariff	Rs. 220/ kVA/ mth				Rs. 220/ kVA/mth	
<i>Optional ToD tariff</i>					<i>Compulsory ToD tariff</i>	
22.00-06.00 hrs	0	-75			0	-50

Sub-category & Consumption Slab	Existing				Proposed	
	Fixed Charges (Rs/HP/mth)	Energy Charge (paise/kWh)	Regulatory Liability Charge (paise/kWh)	FAC (paise/kWh)	Fixed Charges (Rs/HP/mth)	Energy Charge (paise/kWh)
06.00-09.00 hrs	0	0			0	0
09.00-12.00 hrs	0	50			0	100
12.00-18.00 hrs	0	0			0	0
1800-2200 hrs	0	90			0	150

### 7.1.5 Public Water Works (PWW)

Sub-category & Consumption Slab	Existing				Proposed	
	Fixed Charges (Rs/HP/mth)	Energy Charge (paise/kWh)	Regulatory Liability Charge (paise/kWh)	FAC (paise/kWh)	Fixed Charges (Rs/HP/mth)	Energy Charge (paise/kWh)
Urban Public Water Works	60	240		96	90	400
Rural Public Water Works				96		
- Grampanchayat	25	100		96	50	250
- Metered tariff (incl. C Class Municipal Councils)	35	150		96	60	305

### 7.1.6 Agriculture

Sub-category & Consumption Slab	Existing				Proposed	
	Fixed Charges (Rs/HP/mth)	Energy Charge (paise/kWh)	Regulatory Liability Charge (paise/kWh)	FAC (Rs/HP/mth) or (paise/kWh)	Fixed Charges (Rs/HP/mth)	Energy Charge (paise/kWh)
Flat rate tariff						
- Category 1 circles	150			63	213	

Sub-category & Consumption Slab	Existing				Proposed	
	Fixed Charges (Rs/HP/mth)	Energy Charge (paise/kWh)	Regulatory Liability Charge (paise/kWh)	FAC (Rs/HP/mth) or (paise/kWh)	Fixed Charges (Rs/HP/mth)	Energy Charge (paise/kWh)
(<1300 hrs/HP/yr)						
- Category 2 circles (>1300 hrs/HP/yr)	180			74	255	
Metered tariff (incl. Poultry Farms)	15	110		96	15	206

The agricultural tariffs in the State are already very high as compared to other States, as shown in the comparison of tariffs in previous paragraphs. It may not be practical to increase the agricultural tariffs any further, because of 'capacity to pay' concerns, as well as 'quality of supply' issues. It is an accepted fact that the quality of supply to agricultural consumers is inferior as compared to the quality of supply to other urban consumers, due to the higher incidence of load shedding, voltage drops, poorer service infrastructure in rural areas, and non-supply during peak hours.

The issue of cross-subsidy and agricultural tariffs was also discussed in the State Advisory Committee (SAC) meeting in the Commission's office in February 2005, wherein it was discussed that it might not be practical to increase the agricultural tariffs further, considering the requirement of State Government subsidy support and given the quality of supply to agricultural consumers.

Hence, MSEDCL proposes that there should be no increase in tariff for agricultural consumers, and the existing tariff (after adding prevailing FAC) should continue till such time as it is revised further.

The NTP also stipulates that agricultural tariff may be set at different levels in different parts of the State, depending on the condition of the ground water table, as follows:

*"While fixing tariff for agricultural use, the imperatives of the need of using ground water resources in a sustainable manner would also need to be kept in mind in addition to the average cost of supply. Tariff for agricultural use may be set at different levels for different parts of a state depending of the condition of the ground water table to prevent excessive depletion of ground water. Section 62 (3) of the Act provides that geographical position of any area could be one of the criteria for tariff*

*differentiation. A higher level of subsidy could be considered to support poorer farmers of the region where adverse ground water table condition requires larger quantity of electricity for irrigation purposes subject to suitable restrictions to ensure maintenance of ground water levels and sustainable ground water usage."*

In this context, the existing tariff structure of differential tariff for circles having a consumption norm of less than 1300 hours/HP/month and circles having a consumption norm higher than 1300 hours/HP/month, is in consonance with the above NTP provision as the consumption norm reflects the water levels in the area, as well as the cropping pattern.

### 7.1.7 Street Light

Sub-category & Consumption Slab	Existing				Proposed	
	Fixed Charges (Rs/kW/mth)	Energy Charge (paise/kWh)	Regulatory Liability Charge (paise/kWh)	FAC (paise/kWh)	Fixed Charges (Rs/kW/mth)	Energy Charge (paise/kWh)
Grampanchayat & C Class Municipals	30	210		96	50	380
Municipal Corporations	30	250		96	50	430

### 7.1.8 HT Categories

#### 7.1.9 HTP - I & II - High Tension Industrial

Sub-category & Consumption Slab	Existing				Proposed	
	Demand Charges (Rs/kVA/mth)	Energy Charge (paise/kWh)	Regulatory Liability Charge (paise/kWh)	FAC (paise/kWh)	Fixed Charges (Rs/kVA/mth)	Energy Charge (paise/kWh)
HTP - I (BMR/PMR)	350	215	50	96	400	495
HTP - II (Others)	330	210	50	96	380	490
Seasonal category	350	300		96	400	545

Sub-category & Consumption Slab	Existing				Proposed	
	Demand Charges (Rs/kVA/ mth)	Energy Charge (paise/ kWh)	Regulatory Liability Charge (paise/ kWh)	FAC (paise/ kWh)	Fixed Charges (Rs/ kVA / mth)	Energy Charge (paise/kWh)
<i>ToD tariff</i>						
22.00-06.00 hrs	0	-85			0	-50
06.00-09.00 hrs	0	0			0	0
09.00-12.00 hrs	0	60			0	110
12.00-18.00 hrs	0	0			0	0
18.00-22.00 hrs	0	100			0	180

The inter-State comparison of HT and LT industrial tariffs clearly shows that the industrial tariffs in Maharashtra are lower than the tariffs prevailing in other comparable States. In Maharashtra, if all rebates and discounts are considered, then the effective tariff (excluding FAC) works out to Rs. 3 to 3.5 per kWh, depending on the consumer's contract demand, load factor and time of day consumption. This is quite low, in comparison to the average cost of supply of MSEDCL.

The Commission, in the recently issued Tariff Order for BEST, has clearly outlined its strategy of giving economic signals for load regulation, as stated below:

*"The State of Maharashtra is passing through a phase of acute power shortage, and even Mumbai city, which so far has been spared of load shedding, is likely to face power shortages in the coming summer months. In the absence of additional capacity in the region, there is an urgent need for energy conservation and load management by all power intensive consumers. In order to achieve this, the Commission has adopted the principle of economic signals for high consumption consumers, i.e., residential (households, which would typically have energy intensive equipment such as air conditioners) and commercial consumers having consumption > 300 units per month and all LT/HT industrial and HT commercial consumers."*

In its Order issued on January 10, 2006, in Case 35 of 2005, the Commission has stipulated load regulation targets for HT industrial consumers as follows:

*"HT non-continuous industries have to restrict their monthly consumption to less than or equal to 80% of their average monthly consumption over the past three*

*months, in MU terms. Similarly, HT continuous industries have to restrict their monthly consumption to less than or equal to 90% of their average monthly consumption over the past three months, in MU terms. In case the stipulated target is not achieved by the end of February 2006, the entire MIDC area or the dedicated feeder will be subjected to an additional day of no-supply during the week, from the beginning of March 2006."*

Subsequently, the Commission issued a Corrigendum and Clarificatory Order on February 21, 2006, stating, inter alia,

*"The period for reference for comparison of consumption has been modified from the three-month billing period from October to December 2005, to the twelve-month billing period from January to December 2005.*

...

*If HT continuous process industries connected through express/dedicated feeder, fail to achieve the 90% load regulation target, then additional staggering day of load shedding will not be introduced in these cases, and this aspect will be addressed through appropriate tariff measures."*

In line with the same principles, industrial tariffs have been increased by around 33%, to account for the shortfall in revenue, due to non-increase in agricultural tariffs. This will also facilitate the load regulation targets specified by the Commission in its Order in Case 35 of 2005 to be effective.

Also, MSEDCL proposes that all the rebates and incentives to HT industrial category (bulk discount, load factor incentive, prompt payment incentive, and power factor incentive) be withdrawn. This is consistent with the philosophy of dis-incentivising higher consumption.

#### 7.1.10 HTP -III & IV - High Tension Public Water Works

Sub-category & Consumption Slab	Existing				Proposed	
	Demand Charges (Rs/kVA/ mth)	Energy Charge (paise/ kWh)	Regulatory Liability Charge (paise/ kWh)	FAC (paise/ kWh)	Fixed Charges (Rs/ kVA / mth)	Energy Charge (paise/kWh)
HTP - III (BMR/PMR)	350	215		96	380	400

Sub-category & Consumption Slab	Existing				Proposed	
	Demand Charges (Rs/kVA/ mth)	Energy Charge (paise/ kWh)	Regulatory Liability Charge (paise/ kWh)	FAC (paise/ kWh)	Fixed Charges (Rs/ kVA / mth)	Energy Charge (paise/kWh)
HTP - IV (Others)	330	210		96	380	390
<i>ToD tariff</i>						
22.00-06.00 hrs	0	-85			0	-50
06.00-09.00 hrs	0	0			0	0
09.00-12.00 hrs	0	60			0	110
12.00-18.00 hrs	0	0			0	0
18.00-22.00 hrs	0	100			0	180

### 7.1.11 HTP - V - Railway Traction

Sub-category & Consumption Slab	Existing				Proposed	
	Demand Charges (Rs/kVA/ mth)	Energy Charge (paise/ kWh)	Regulatory Liability Charge (paise/ kWh)	FAC (paise/ kWh)	Fixed Charges (Rs/ kVA / mth)	Energy Charge (paise/kWh)
HTP - V		335	50	96		610

### 7.1.12 HTP - VI - High tension Residential & Commercial Complexes

Sub-category & Consumption Slab	Existing				Proposed	
	Demand Charges (Rs/kVA/ mth)	Energy Charge (paise/ kWh)	Regulatory Liability Charge (paise/ kWh)	FAC (paise/ kWh)	Fixed Charges (Rs/ kVA / mth)	Energy Charge (paise/kWh)
Residential Complex	125	220		96	200	405
Commercial Complex	125	350		96	200	575

### 7.1.13 HTP VII (Agriculture)

Sub-category	Existing	Proposed
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	Demand Charges (Rs/HP/mth)	Energy Charge (paise/kWh)	Regulatory Liability Charge (paise/kWh)	FAC (paise/kWh)	Fixed Charges (Rs/HP/mth)	Energy Charge (paise/kWh)
HTP - VII (incl Poultry, Agri high tech)	25	130		96	75	265

#### 7.1.14 Mula Pravara Electric Co-operative Society (MPECS)

Sub-category & Consumption Slab	Existing				Proposed	
	Demand Charges (Rs/kVA/mth)	Energy Charge (paise/kWh)	Regulatory Liability Charge (paise/kWh)	FAC (paise/kWh)	Fixed Charges (Rs/kVA/mth)	Energy Charge (paise/kWh)
MPECS	200	140		96	200	300

#### 7.1.15 The Tata Power Company (TPC)

Sub-category & Consumption Slab	Existing				Proposed	
	Demand Charges (Rs/kVA/mth)	Energy Charge (paise/kWh)	Regulatory Liability Charge (paise/kWh)	FAC (paise/kWh)	Fixed Charges (Rs/kVA/mth)	Energy Charge (paise/kWh)
TPC	600	299		96	600	500

The net energy interchange between MSEDCL and TPC (after aggregating readings at various interface points) could also be priced at the monthly weighted average marginal variable cost for MSEDCL, rather than specifying a rate, as the rate could keep varying.

## 8 REVENUE FROM PROPOSED TARIFFS

The revenue from proposed tariffs in FY 2006-07 has been estimated by applying the proposed rates to the projected sales and consumer related data, such as number of consumers, connected load, contract demand, ratio of billing demand to contract demand, etc. The revenue from proposed tariffs in FY 2006-07 (assuming applicability for the entire year) has been estimated as Rs. 24405 crore. The detailed

revenue computation has been given in Form 13 (refer **Annexure 1**) of the Formats specified by the Commission.

## **9 PRAYER**

- a) The delay in filing this ARR & Tariff Petition may please be condoned and the Hon'ble Commission is requested to accept this Petition and process the Petition expeditiously.
- b) The category-wise tariffs proposed by MSEDCL may please be approved in accordance with the submissions and rationale given in this Petition.
- c) Any errors/omissions may please be condoned, and opportunity be given to rectify the same.

## **10 MSEDCL'S COMPLIANCE WITH DIRECTIVES**

The status of the compliance with Directives issued by the Hon'ble Commission from time to time alongwith supporting documents is enclosed at **Annexure-2**

**ANNEXURE 3 – Proposed Infrastructure Plan (Capital Works Plan – Amount in Rs. Lakh)**

INFRASTRUCTURE PLAN FOR 3 YEARS (2006-09)										
SR. NO.	PARTICULARS	UNIT	2006-07		2007-08		2008-09		Total	
			Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount
<b>A</b>	<b>CAPITAL WORKS</b>									
1	<b>33/11 KV S/Stn</b>									
	(a) Nos.	Nos.	57	10444	250	45411	248	45058	555	100913
	(b) MVA	MVA	336		1460		1448		3244	
2	<b>Augmentation ( Total )</b>	Nos.	47	2415	206	10501	204	10419	457	23335
	(a) 3.15 MVA to 5 MVA	Nos.	38	1774	167	7713	165	7653	370	17140
	(b) 5 MVA to 10 MVA	Nos.	9	650	40	2826	39	2804	88	6280
	MVA added through augmentation	MVA	116		506		502		1125	
3	<b>Additional Power Transformer (Total )</b>	Nos.	34	2631	149	11438	147	11349	330	25417
	(a) 3.15 MVA	Nos.	1	34	5	146	5	145	11	325
	(b) 5 MVA	Nos.	30	2321	132	10090	131	10011	293	22421
	(c) 10 MVA	Nos.	3	297	12	1293	12	1283	27	2873
	<b>MVA added through additional power T/F</b>	MVA	183		796		790		1770	
4	<b>22/11 KV S/Stn</b>									
	(a) Nos.	Nos.	4	1055	16	4586	16	4550	35	10191
	(b) MVA	MVA	44		191		190		425	
	<b>Total Capacity addition(1+2+3+4)</b>	MVA	679		2953		2930		6563	
5	<b>Switching Stations (Total )</b>	Nos.	3	665	16	2891	16	2868	35	6424
	(a) 22 KV	Nos.	3	601	14	2613	14	2593	31	5807
	(b) 11 KV	Nos.	0	64	2	277	2	275	4	616
6	<b>Bay (Total )</b>	Nos.	146	1275	635	5544	630	5501	1412	12321

INFRASTRUCTURE PLAN FOR 3 YEARS (2006-09)										
SR. NO.	PARTICULARS	UNIT	2006-07		2007-08		2008-09		Total	
			Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount
	(a) 33 KV	Nos.	51	638	224	2772	222	2751	497	6160
	(b) 22 KV	Nos.	13	149	55	649	55	644	123	1443
	(c) 11 KV	Nos.	82	488	356	2123	354	2107	792	4718
7	<b>33 KV Line ( Total )</b>	km	844	7042	3670	30618	3641	30379	8156	68039
	(a) Overhead	km	813	6124	3534	26626	3507	26419	7854	59168
	(b) Underground	km	31	918	136	3992	135	3961	302	8871
8	<b>22 KV Line ( Total )</b>	km	455	3439	1979	14951	1964	14835	4399	33224
	(a) Overhead	km	388	1762	1686	7662	1673	7602	3746	17026
	(b) Underground	km	68	1677	294	7289	291	7233	653	16199
9	<b>11 KV Line ( Total )</b>	km	5688	15256	24731	66332	24539	65816	54958	147404
	(a) Overhead	km	5556	12497	24157	54334	23969	53911	53682	120742
	(b) Underground	km	132	2759	574	11998	570	11904	1277	26662
	<b>H.T.Line added (8+9+17c+17d)</b>	km	8749	909	38039	3951	37743	3920	84531	8780
10	<b>22/0.4 KV DTC</b>	Nos.	553		2406		2387		5346	
	25 KVA	Nos.	6	12	26	51	26	50	58	113
	50 KVA	Nos.	0	0	0	0	0	0	0	0
	63 KVA	Nos.	194	690	842	3000	835	2976	1871	6666
	100 KVA	Nos.	211	830	918	3611	911	3582	2041	8023
	150 KVA	Nos.	0	0	0	0	0	0	0	0
	200 KVA	Nos.	65	375	284	1631	282	1618	631	3624
	315 KVA	Nos.	61	366	267	1592	265	1580	593	3539
	630 KVA	Nos.	16	170	68	739	68	733	152	1642
	<b>Capacity Added</b>	MVA	76		329		327		732	

INFRASTRUCTURE PLAN FOR 3 YEARS (2006-09)										
SR. NO.	PARTICULARS	UNIT	2006-07		2007-08		2008-09		Total	
			Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount
11	<b>22/0.4 KV DTC Augmentation</b>									
	(a) Nos.	Nos.	204	819	886	3560	879	3533	1968	7912
	(b) MVA Added	MVA	33		143		142		317	
12	<b>11/0.4 KV DTC</b>	Nos.	6562		28532		28310		63405	
	25 KVA	Nos.	1309	2988	5691	12993	5646	12892	12646	28873
	50 KVA	Nos.	0	1	2	3	2	3	4	7
	63 KVA	Nos.	3198	8503	13902	36969	13794	36681	30894	82152
	100 KVA	Nos.	1862	5718	8095	24860	8032	24667	17989	55245
	150 KVA	Nos.	2	7	10	29	10	28	22	64
	200 KVA	Nos.	132	653	573	2840	569	2818	1274	6311
	315 KVA	Nos.	30	191	130	829	129	823	288	1842
	630 KVA	Nos.	30	271	130	1176	129	1167	288	2614
	<b>Capacity Added</b>	MVA	475		2066		2050		4592	
13	<b>11/0.4 KV DTC Augmentation</b>									
	(a) Nos.	Nos.	356	645	1547	2803	1535	2781	3437	6229
	(b) MVA Added	MVA	25		110		109		244	
	<b>Total DTC capacity addition (10+11+12+13+17a+17b)</b>	MVA	761		3307		3281		7349	
14	<b>L.T. Line 3 Ph. ( Total )</b>	km	2098	5154	9120	22410	9049	22236	20266	49800
	(a) Overhead	km	2004	4507	8714	19595	8646	19443	19364	43545
	(b) Underground	km	93	669	406	2910	403	2888	902	6467
15	<b>L.T. Line 1 Ph. ( Total )</b>	km	307	543	1333	2361	1323	2343	2962	5248
	(a) Overhead	km	275	421	1194	1830	1185	1816	2653	4067
	(b) Underground	km	32	122	139	531	138	527	309	1180

INFRASTRUCTURE PLAN FOR 3 YEARS (2006-09)										
SR. NO.	PARTICULARS	UNIT	2006-07		2007-08		2008-09		Total	
			Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount
	<b>L.T.Line added</b>	km	2404	5697	10453	24771	10372	24579	23229	55048
16	<b>Service Connections</b>									
	(a) Domestic & Commercial	Nos.	98010	2705	426130	11760	422815	11669	946955	26134
	(b) L.T.Agricultural	Nos.	18975	1474	82499	6408	81857	6358	183330	14240
	(c) L.T.Industrial	Nos.	3047	257	13248	1117	13145	1108	29439	2482
	(d) Others	Nos.	853	74	3709	323	3680	320	8241	717
	<b>Total</b>	Nos.	120884	4510	525585	19608	521497	19455	1167966	43573
17	<b>HVDS</b>									
	(a) 25 KVA DTC	Nos.	4313	6885	18753	29937	18607	29704	41674	66526
	(b) 16 KVA DTC	Nos.	2728	3171	11862	13788	11769	13681	26359	30641
	(c) 22 KV Line	km	114	285	495	1241	491	1231	1099	2757
	(d) 11 KV Line	km	2492	6813	10834	29621	10750	29390	24075	65824
18	<b>Capacitors</b>									
	(a) Station type	Nos.	88	668	383	2904	380	2881	850	6453
	(b) Online (0.6 MVAR)	Nos.	213	497	926	2159	919	2142	2058	4798
	(c) LTLMS	Nos.	3859	745	16779	3238	16649	3213	37287	7195
19	<b>SCADA</b>		4	43	18	187	17	185	39	415
20	<b>Call Center</b>		7	29	31	124	30	123	68	276
21	<b>Other Than Above*</b>			2567		11160		11073		24801
	<b>TOTAL CAPITAL WORKS (A)</b>			<b>97910</b>		<b>425695</b>		<b>422384</b>		<b>945988</b>

**ANNEXURE 4 – Proposed Infrastructure Plan (R&M Works Plan- Amount in Rs. lakh)**

INFRASTRUCTURE PLAN FOR 3 YEARS (2006-09)										
SR. NO.	PARTICULARS	UNIT	2006-07		2007-08		2008-09		Total	
			Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount
<b>B</b>	<b>RENOVATION &amp; MODERNISATION WORKS</b>									
1	Reconductoring of 33 KV Line	Km	424	969	1844	4215	1830	4182	4099	9366
2	Reconductoring of 22 KV Line	Km	261	736	1135	3200	1126	3175	2522	7111
3	Reconductoring of 11 KV Line	Km	1298	2142	5643	9314	5599	9242	12540	20698
4	Reconductoring of L.T. Line	Km	2374	1915	10320	8326	10239	8261	22932	18503
5	Conversion of Overhead to Underground									
	(a) 33 KV line	Km	3	13	14	55	14	55	31	123
	(b) 22 KV line	Km	27	575	119	2501	118	2481	265	5557
	(c) 11 KV line	Km	45	541	195	2351	194	2333	434	5225
	(d) L.T. line	Km	129	871	562	3788	557	3758	1248	8417
6	Replacement of Cables									
	(a) 70 sqmm	Km	88	163	381	707	378	701	847	1571
	(b) 95 sqmm	Km	62	135	271	585	269	581	602	1301
	(c) 120 sqmm	Km	83	253	363	1099	360	1090	806	2442
	(d) 150 sqmm	Km	4	13	20	55	19	54	43	122
	(e) 185 sqmm	Km	79	202	343	878	341	872	763	1952
	(f) 240 sqmm	Km	26	176	114	764	113	758	253	1697
	(g) 300 sqmm	Km	38	360	165	1567	164	1555	366	3482
	(h) 400 sqmm	Km	3	28	14	121	14	120	31	268

<b>7</b>	<b>33/11 KV S/Stn Revamping</b>									
	(a) R&M ( Indoor to Outdoor)	Nos.	34	1368	146	5947	145	5901	324	13215
	(b) Transformers	Nos.	13	24	57	104	57	103	127	231
	(c) CTs									
	(i) 33 KV	Nos.	220	49	954	214	947	213	2121	476
	(ii) 22 KV	Nos.	47	11	205	49	203	49	455	110
	(iii) 11 KV	Nos.	394	44	1715	190	1701	188	3810	422
	(d) PTs									
	(i) 33 KV	Nos.	173	32	754	138	748	137	1676	306
	(ii) 22 KV	Nos.	21	4	93	19	92	19	207	42
	(iii) 11 KV	Nos.	214	20	932	89	924	88	2070	197
	(e) Circuit Breakers									
	(i) 33 KV	Nos.	86	330	374	1436	371	1425	831	3190
	(ii) 22 KV	Nos.	25	79	107	345	106	342	237	767
	(iii) 11 KV	Nos.	188	682	817	2966	811	2943	1816	6591
	(f) Isolators	Nos.	269	116	1170	503	1161	499	2601	1118
	(g) Lightning Arrester	Nos.	363	44	1578	190	1566	188	3507	422
	(h) Control Panels	Nos.	76	212	329	923	327	916	732	2051
	(i) Battery	Nos.	71	16	307	68	305	68	682	152
	(j) Battery Charger Set	Nos.	55	18	240	79	238	78	534	175
	(k) Capacitors	Nos.	47	31	204	134	202	133	453	297
	(l) Reearthing	Nos.	80	70	347	302	344	300	770	672
<b>8</b>	<b>DTC Metering</b>	Nos.	11691	2486	50830	10807	50435	10723	112956	24016
<b>9</b>	<b>DTC Maintenance</b>									
	(a) Re-earthing	Nos.	7960	544	34610	2365	34340	2347	76910	5257
	(b) Replacement of Distribution Boxes	Nos.	7294	2216	31713	9635	31466	9560	70473	21411

	(c) Replacement of LT Cables	Km	849	865	3690	3761	3661	3732	8199	8359
10	<b>Replacement of poles</b>									
	(a) H.T. poles	Nos.	6284	840	27320	3651	27107	3622	60711	8112
	(b) L.T. poles	Nos.	13627	543	59249	2360	58788	2342	131665	5244
11	<b>Replacement of Meters</b>									
	(a) 1 Phase	Nos.	321235	3025	1396673	13152	1385810	13050	3103718	29228
	(b) 3 phase	Nos.	79470	2471	345523	10744	342836	10660	767829	23874
	(c) CT operated meter	Nos.	4080	747	17739	3249	17601	3224	39421	7221
12	<b>Feeder Pillar</b>									
	(a) 22 KV Feeder Pillar	Nos.	15	5	67	22	66	22	148	49
	(b) 11 KV Feeder Pillar	Nos.	81	50	350	218	347	217	778	485
	(c) LT Feeder Pillar 4 Way	Nos.	536	180	2332	784	2314	778	5182	1742
	(d) LT Feeder Pillar 6 Way	Nos.	328	120	1427	521	1416	517	3172	1157
	(e) Mini Feeder Pillar	Nos.	1369	94	5951	410	5905	407	13225	912
13	<b>Ring Main Unit</b>	Nos.	85	230	372	1000	369	992	826	2223
14	<b>Providing Guardings</b>	Nos.	12629	402	54907	1747	54480	1733	122016	3882
15	<b>Crimping of jumpers at cut points</b>	Nos.	15104	309	65670	1345	65160	1334	145934	2988
16	<b>T&amp;P</b>	Ls	10937	208	47551	904	47181	897	105669	2010
17	<b>Civil Works</b>	Ls	32	802	139	3486	138	3459	310	7746
18	<b>Other than above *</b>			2904		12627		12529		28060
	Total Material cost for R & M WORKS (SubTotal A)			31286		136024		134966		302276
	I) Direct Charges									
	a) Labour charges on material	10%	1	3128	5	13602	4	13496	10	30226
	b) Transport on material	5%	1	1564	2	6801	2	6749	5	15114
	c) Insurance on material	1%	0	313	0	1361	0	1350	1	3023

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d) Service Tax (on a, b, c)	12.24%	1	613	6	2664	5	2643	12	5920
e) Contingencies on material	3%	0	939	1	4081	1	4050	3	9070
f) Tools & Plants on material	1.50%	0	469	1	2040	1	2024	2	4533
g) Contractor supervision on material	10%	1	3128	5	13602	4	13496	10	30226
h) Contractor financing on material	3%	0	939	1	4081	1	4050	3	9070
SubTotal B	0	0	42379	0	184257	0	182824	0	409459
i) Contractor profit on SubTotal B	5%	1	2119	2	9212	2	9141	5	20472
SubTotal C	0	0	44498	0	193469	0	191964	0	429931
j) Escalation on material	5%	1	1569	2	6823	2	6770	5	15162
SubTotal D	0	0	46067	0	200291	0	198734	0	445092
k) H.O. supervision on SubTotal D	10%	1	4607	5	20030	4	19874	10	44511
SubTotal E	0	0	50674	0	220320	0	218607	0	489601
l) Interest during construction period on total	2.50%	0	1267	1	5507	1	5465	3	12239
<b>Total R&amp;M works (B)</b>			<b>52413</b>		<b>227882</b>		<b>226110</b>		<b>506405</b>

**Annexure X - List of Assets Transferred to MSEDCL as per Transfer Scheme**

Sl.	Name of the Establishment	Functions
1	Amravati Zone Akola (With all I.T. Centers, DCBC Centers, Field inspection Unit of GAD and Accounts, Vigilance Units, Flying Squads).	Operation and Maintenance of distribution network system under Amravati Zone, Akola.
i	Amravati Circle and Divisions, sub-dns and sections thereunder.	Operation and Maintenance of Distribution network system.
ii	Akola Circle and Divisions, sub-dns and sections thereunder.	– Do –
iii	Buldhana Circle and Divisions, sub-dns and sections thereunder.	– Do –
iv	Yeotmal Circle and Divisions, sub-dns and sections thereunder.	– Do –
2	Aurangabad. Zone (With all I.T. Centers, DCBC Centers, Field inspection Unit of GAD and Accounts, Office of Asst. Director (V & S), Vigilance Units, flying squads).	Operation and Maintenance of Distribution network system under Aurangabad Zone.
i	Aurangabad Rural O and M Circle and Divisions, sub-dns and sections there under.	Operation and Maintenance of Distribution network system.
ii	Aurangabad O and M Urban Circle and Divisions, sub-dns and sections there under.	– Do –
iii	Jalna O and M Circle and Divisions, sub-dns and sections there under.	– Do –
iv	Parbhani O and M Circle and Divisions, sub-dns and sections there under.	– Do –
3 .	Beed Zone, Latur (With all I.T. Centers, DCBC Centers, Field inspection Unit of GAD and Accounts, Vigilance Units, flying squads).	Operation and Maintenance of Distribution network system under Beed Zone.
i	Latur Rural O and M Circle and Divisions, sub-dns and sections there under.	Operation and Maintenance of Distribution network system.
ii	Beed O and M Circle and Divisions, sub-dns and sections there under.	– Do –

Sl.	Name of the Establishment	Functions
iii	Osmanabad Circle and Divisions, sub-dns and sections there under.	Operation and Maintenance . of Distribution network system.
iv	Nanded Circle and Divisions, sub-dns and sections there under.	– Do –
4	Bhandup Urban Zone (With all IT. Centers, DCBC Centers, Field inspection Unit of GAD and Accounts, Vigilance Units, flying squads).	Operation and Maintenance of Distribution network system under Bhandup Zone.
i	Thane Urban Circle	Operation and Maintenance of Distribution network system.
	• Bhandup O and M Divisions, and sub-dns sections there under.	– Do –
	• Kalwa O and M Divisions and sub-dns sections there under.	– Do –
	• Mulund O and M Divisions, and sub-dns sections there under.	– Do –
	• Wagale Estate O and M Divisions, and sub-dns sections there under.	– Do –
	• Thane O and M Urban Divisions, and sub-dns sections there under.	– Do –
ii	Bhivandi O and M Circle and Divisions, and sub-dns and sections there under.	Operation and Maintenance of Distribution network system.
iii	Vashi O and M Circle and Divisions, sub-dns and sections there under.	Operation and Maintenance of Distribution network system.
5.	Nashik Zone, Nashik (With all I.T. Centers, DCBC Centers, Field inspection Unit of GAD and Accounts, Vigilance Units, flying squads):	Operation and Maintenance of Distribution network system under Nashik Zone,
i	Ahmednagar O and M Circle and Divisions, sub-dns and sections there under.	Operation and Maintenance of Distribution network system.
ii	Dhule O and M Circle and Divisions, sub-dns and section there under.	Operation and Maintenance of Distribution network system.
iii	Jalgaon O and M Circle and Divisions, sub-dns and sections	– Do –
iv	Nashik O and M Circle and Divisions, sub-dns and sections there under.	– Do –

Sl.	Name of the Establishment	Functions
v	Nashik Urban Circle and Divisions, and sub-dns and sections there under.	– Do –
6	Pune Zone, Pune (With all I.T. Centers, DCBC Centers, Field inspection Unit of GAD and Accounts, Offices of Dy. Director (V and S), Asst. Director (V and S). Vigilance Units, flying squads).	Operation and Maintenance of Distribution network system under Pune Zone,
i	Pune Ganeshkhind Urban Circle and Divisions, sub-dns and sections there under.	Operation and Maintenance of Distribution network system.
ii	Pune Rasta Peth Urban Circle and Divisions, sub-dns and sections there under.	– Do –
iii	Pune Rural Circle and Division, sub-dns and sections there under.	– Do –
7	Kokan Zone, Ratnagiri (With all I.T. Centers, DCBC Centers, Field inspection Unit of GAD and Accounts Vigilance Units, flying squads).	Operation and Maintenance of Distribution network system under Kokan Zone, Ratnagiri.
i	Sindhudurg O and M Circle and Divisions, sub-dns and sections there under.	Operation and Maintenance of Distribution network system.
ii	Ratnagiri O and M Circle and Divisions, sub-dns and sections there under, (except Ratnagiri EHV O and M Cum-Testing Dn.)	– Do –
8	Kalyan Zone, Kalyan (With all I.T. Centers, DCBC Centers, Field inspection Unit of GAD and Accounts, Offices of Dy. Director (V and S), Asst. Director (V and S), Vigilance Units, flying squads).	Operation and Maintenance of Distribution network system under Kalyan Zone Kalyan.
i	Kalyan O and M Circle and Divisions, sub-dns and sections there under.	Operation and Maintenance of Distribution network system.
ii	Pen O and M Circle and Divisions, sub-dns and sections there under.	– Do –
iii	Vasai O and M Circle and Divisions, sub-dns and sections . there under.	– Do –
iv	Kalyan Urban Circle and Divisions, sub-dns and sections there under.	– Do –

Sl.	Name of the Establishment	Functions
9	Kolhapur Zone, Kolhapur (With all I.T. Centers, DCBC Centers, Field inspection Unit of GAD and Accounts, Vigilance Units, flying squads).	Operation and Maintenance of Distribution network system under Kolhapur Zone.
i	Kolhapur O and M Circle and Divisions, sub-dns and sections there under.	Operation and Maintenance of Distribution network system.
ii	Sangli O and M Circle and Divisions, sub-dns and sections there under.	– Do –
iii	Solapur O and M Circle and Divisions, sub-dns and sections there under.	– Do –
iv	Satara O and M Circle and Divisions, sub-dns and sections there under.	– Do –
10	Nagpur Zone (Rural) (With all I.T. Centers, DCBC Centers, Field inspection Unit of GAD and Accounts, Offices of Dy. Director (V and S), Asst. Director (V and S), Vigilance Units, flying squads).	Operation and Maintenance of Distribution network system under Nagpur Zone (Rural).
i	Bhandara O and M Circle and Divisions, sub-dns and sections there under.	Operation and Maintenance of Distribution network system.
ii	Chandrapur O and M Circle and Divisions, sub-dns and sections there under.	– Do –
iii	Gadchiroli O and M Circle and Divisions, sub-dns and sections there under.	Operation and Maintenance of Distribution network system.
iv	Wardha O and M Circle and Divisions, sub-dns and sections there under.	– Do –
11	Nagpur Urban Zone (With all I.T. Centers, DCBC Centers, Field inspection Unit of GAD and Accounts, Vigilance Units, flying squads).	Operation and Maintenance of Distribution network system under Nagpur Urban Zone.
i	Nagpur Urban Circle and all Divisions and sub-dns sections there under, (except Nagpur Receiving Station Testing Division, Nagpur, Testing Division.)	Operation and Maintenance of Distribution network system.

Sl.	Name of the Establishment	Functions
ii	Nagpur Rural Circle and Divisions, sub-dns and sections there under.	– Do –
12	Stores Offices <ul style="list-style-type: none"> <li>• Stores Management Circle, Pune</li> <li>• Stores Management Circle, Aurangabad.</li> <li>• Major Stores Fursungi Kolhapur, Ratnagiri, Kalyan, Kamptee, Amravati, A'bad, Nashik, Nanded.</li> <li>• Stores Centre Satara, Solapur, Sangli, Kudal, Palghar, Bhadndup, Ahmednagar, Panvel, Akola, Khamgaon, Yeotmal, Chandrapur, Tumsar, Beed, Latur, Parbhani, Jalgaon.</li> </ul>	Procurement of material and store management.
13	Civil Offices <ul style="list-style-type: none"> <li>• Civil constn. cum Maintenance, Division Pune.</li> <li>• C.C.M. Division, Baramati.</li> <li>• C.C.C.M. Division, Satara Civil.</li> <li>• Constn. cum Maintenance Circle Nagpur.</li> <li>• C.C.M Division, Nagpur</li> <li>• C.C.C.M. Division, Ballarsha</li> <li>• C.C.C.M. Division, Aurangabad</li> <li>• Civil Constn. Cum-Maintenance. Circle, Bandra.</li> <li>• Estate Management Division, Pune and Nagpur.</li> <li>• C.C.C.M. Division, Baramati.</li> <li>• C.C.C.M. Division, Kalyan</li> <li>• C.C.C.M. Division, Vasai</li> <li>• C.C.C.M Division, Osmanabad</li> <li>• Civil Unit under P.C. Pf Cell,- Mumbai</li> <li>• All P.C. Poll Factories.</li> </ul>	Civil Constn. and Maintenance work.

**Annexure 5: Load Shedding and Power Purchase**

MONTH	PART-I							PART-II						
	Considering availability from all sources							Considering availability without costly power (Kawas liquid, RGPPL, Captive, Bi-lateral)						
	Group	I LS Protocol			Equal L.S. hours to all Categories			Considering existing LS Protocol & increasing equal LS hrs. to all categories			Equal L.S. hours to all Categories			
Ag. Dominated		Urban & Ind. Conglomeration	Other region	Ag. Dominated	Urban & Ind. Conglomeration	Other region	Ag. Dominated	Urban & Ind. Conglomeration	Other region	Ag. Dominated	Urban & Ind. Conglomeration	Other region		
July-06 Aug,06 Sept 06	A	11.00	2.50	4.50	8.00	8.00	8.00	The quantum of costly power is less being rainy season hence impact is negligible						
	B	11.50	3.00	5.00	8.00	8.00	8.00							
	C	12.00	3.50	5.50	8.00	8.00	8.00							
	D	12.00	4.00	6.00	8.00	8.00	8.00							
OCTOBER	A	7.50	1.50	3.00	6.00	6.00	6.00	12.50	4.00	6.00	9.50	9.50	9.50	
	B	8.00	2.00	3.50	6.00	6.00	6.00	13.00	4.50	6.50	9.50	9.50	9.50	
	C	8.50	2.50	4.00	6.00	6.00	6.00	13.50	5.00	7.00	9.50	9.50	9.50	
	D	9.00	3.00	4.50	6.00	6.00	6.00	13.50	5.50	7.50	9.50	9.50	9.50	
NOVEMBER	A	10.00	2.50	4.50	7.50	7.50	7.50	14.00	5.50	7.50	11.00	11.00	11.00	
	B	10.50	3.00	5.00	7.50	7.50	7.50	14.50	6.00	8.00	11.00	11.00	11.00	
	C	11.00	3.50	5.50	7.50	7.50	7.50	15.00	6.50	8.50	11.00	11.00	11.00	
	D	11.50	4.00	6.00	7.50	7.50	7.50	15.00	7.00	9.00	11.00	11.00	11.00	
DECEMBER	A	11.00	2.50	4.50	8.00	8.00	8.00	15.50	7.00	9.00	12.25	12.25	12.25	
	B	11.50	3.00	5.00	8.00	8.00	8.00	16.00	7.50	9.50	12.25	12.25	12.25	
	C	12.00	3.50	5.50	8.00	8.00	8.00	16.50	8.00	10.00	12.25	12.25	12.25	
	D	12.00	4.00	6.00	8.00	8.00	8.00	16.50	8.50	10.50	12.25	12.25	12.25	
JANUARY	A	6.50	1.50	2.50	5.00	5.00	5.00	13.00	4.50	6.50	10.00	10.00	10.00	
	B	7.00	1.75	3.00	5.00	5.00	5.00	13.50	5.00	7.00	10.00	10.00	10.00	
	C	7.50	2.00	3.50	5.00	5.00	5.00	14.00	5.50	7.50	10.00	10.00	10.00	
	D	8.00	2.25	4.00	5.00	5.00	5.00	14.00	6.00	8.00	10.00	10.00	10.00	
FEBRUARY	A	8.50	2.25	4.00	6.50	6.50	6.50	14.50	6.50	8.50	11.75	11.75	11.75	
	B	9.00	2.75	4.50	6.50	6.50	6.50	15.00	7.00	9.00	11.75	11.75	11.75	
	C	9.50	3.25	5.00	6.50	6.50	6.50	15.50	7.50	9.50	11.75	11.75	11.75	
	D	10.00	3.75	5.50	6.50	6.50	6.50	15.50	8.00	10.00	11.75	11.75	11.75	
MARCH	A	9.00	2.50	4.25	7.00	7.00	7.00	15.00	6.50	8.50	12.00	12.00	12.00	
	B	9.50	3.00	4.75	7.00	7.00	7.00	15.50	7.00	9.00	12.00	12.00	12.00	
	C	10.00	3.50	5.25	7.00	7.00	7.00	16.00	7.50	9.50	12.00	12.00	12.00	
	D	10.00	4.00	5.75	7.00	7.00	7.00	16.00	8.00	10.00	12.00	12.00	12.00	

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