

To ,

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Distribution Planning & Development Division,  
Seva Bhavan , R K Puram , New Delhi – 110066

Sub :- Uploading of Best Practices on e-platform of CEA.

Ref :- 1. CEA / Best Practices / DPD / 2012 / 1539 – 1682 Dt. 11-05-2012.

2. CEA / Best Practices / DPD / 2012 Dt. 16-04-2012.

Sir ,

As per the directives received from Ministry of Power , New Delhi , the best practices being followed by various departments under Maharashtra State Electricity Distribution Company Limited ( MSEDCL ) are as follows.

1. Human Resources ( HR )
2. Tariff Regulatory Cell ( TRC )
3. Load Management ( LM )
4. Information Technology ( IT )
5. Internal Reforms and Quality Control ( IR&QC )
6. Infrastructure Development ( Infra )
7. Restructured Accelerated Power Development and Program ( R-APDRP )
8. CE ( Commercial )
9. Corporate Finance ( CF )

The details of the best practices of above departments are attached on a separate sheet.

Sd / -

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## **Human Resources ( H.R. )**

### **Improved Consumer Satisfaction:**

M.S.E.D.C.L. is trying its best to improve consumer care services. During the year 2010-11, following step have been taken:-

### **Consumer Facilitation Centre (CFC)**

16 professional Consumer Facilitation Centres (CFC) have been established at 11 cities. It is staffed with 10 people headed by Dy. EE and comprising of supervisor, front office and back office. All facilities/solutions like, fuse call, new connection, change details, bill queries are provided through CFC. By 30 Sep. 2012. Ten more CFCs will be established at various cities.

29 small CFCs comprising of 3 people headed by Junior Engineer are established during the year in various towns to provide one window solution for all problems of consumers.

### **Central Call Centre**

Presently 15 call centers are working at various cities. In 2010-11, M.S.E.D.C.L. planned 100 seater state level, state of art call centre. Infra structure & hardware & software for 40 seater call centre is ready as on date and 60 seater capacity by 30 Sept. 12 is being added.

### **Bill payment**

In addition to usual Bill Payment facilities, following facilities are provided:-

- I. 24 hours bill collection machines installed at selected cities.
- II. On line payment through credit/debit cards, internet banking and through mobile phone
- III. Help desk for facilitation of bill payment established at various locations.

### **Skill Development measures of employees:-**

To give full justice to our mandate of providing quality electric supply to our consumers, we planned to develop / instill exceptional leadership and mentoring professional skills among our employees.

M.S.E.D.C.L. training focus mainly on development of professional competencies, commercial acumen, team building, enhancing confidence levels, developing work culture and enhancing safety standards.

To develop the skills of the employees company proposed the following plan:-

- a. Identify training needs of executives and employees by Training Need Analysis (TNA).
- b. Based on identified needs, training programmes to be prepared and circulates.
- c. Develop training material and improve facilities for training.

Based on the above proposal, TNA was conducted and focus was placed mainly on development of professional competencies, commercial acumen, team building, changing attitude, work culture and enhancing safety standards. The training calendar was prepared and training material was developed accordingly. Biggest challenge was developing

infrastructure and facilities for training 30000 to 35000 employees during the year. After due deliberations the following was planned and successfully implemented:-

- a. **Small Training Centre:-** 25 small training centers located at our circle HQs planned have been established. For this, building plan duly approved with sanction for funds for construction, furniture and facilities was given and simultaneously work started at 25 locations. A standardized building with furniture, equipment have been constructed at various locations notwithstanding the required construction time, these locations were asked to start small training centers in available community/conference hall or by hiring a hall in the vicinity. The training material including, power point presentations were prepared centrally by training department. One Asst. Engineer was posted as Training coordinator who was made responsible to conduct training programme under suspension of local Superintending Engineer. The following programmes during the year were planned and conducted in 25 STCs:-
  - i. Refresher Training for line staff – Two programme per month of 3 days. In a year 24 programmes conducted.
  - ii. HR & Finance one programme per month. In 2010-11 & 2011-12, 31,000 and 34,000 employees respectively have been trained by the company
- b. **Training at Door Steps:-** 12 Management Consultants were hired and given themes like change management, Stress Management, work culture, team building, leadership etc. They were asked to conduct one to three days capsule at Corporate office, Zone HQ and circle HQs. The following programmes conducted :-
- c. **Mass Scale Training** :- Mass Scale Training on safety and consumer relation was conducted during Trade Union Meetings and other functions where at a time 100 to 200 employees attend each programme
- d. **Training at Existing four Training Centres:-** Induction training, IT training, specialized training and training sponsored by P.F.C. & R.E.C. was conducted at our existing training centres where all training facilities including Hostel are available.
- e. **Sponsoring Employees:-** To give good exposure to present practices in industry, future trends etc. About 1000 employees were sponsored to attend training at various renowned training institute like . YASHADA Pune, REMI Mumbai, CENPEID Delhi, Engineering Staff College Hyderabad, Administrative Staff College Hyderabad, MDI Gurgaon, N.P.T.I. Faridabad and C.P.R.I., Bangalore.

The innovative methods adopted by M.S.E.D.C.L. helped in training over 2011-12 34000 employees.

### **Imparting Consumer Education:-**

Safety is very important aspect of our working life and we need to ensure safe environment for employees, consumers and others. Our track record of accidents indicates non adherence to safe practices. Accidents cause avoidable injuries, loss of life and loss of property. Analysis of statistics of accidents shows that most of the accidents are attributed to unsafe practices or negligence on the part of employees. Therefore, it was decided to conduct Safety month from 15 Nov to 15 Dec 2011 to educate employees, school children and consumers on Electric Safety and propogate importance of safety to one and all. More than 100,000 students & consumers were imparted training on electrical safety during the month

### **Optimization of resources for betterment of power sector:-**

There is need to energize the process of Human Resource Development in professional manner & for this various initiatives were taken and successfully implemented for betterment of company as well as employees.

#### **1. Staffing/Reorganizing/Restructuring:**

- a) **Staffing pattern:** For all offices of Company based on Industrial Engineering Study and keeping in view geographic & environmental conditions and commercial aspects.
- b) **Consumer norms:** Revised for various offices- thereby bringing down employee cost
- c) **Reorganization/Restructuring:** Various departments/wings for improving efficiency and cost saving:
- d) **Safety:**
  - a. Safety manual published
  - b. Regular safety training & seminars
- C. Safety Audits

### **Tariff Regulatory Cell**

The steps taken by MSEDCL for Securing the interest of consumers are as follows :

At present MSEDCL follows 3 tier mechanism for Redressal of grievances of consumer

- 1) Internal Grievances Redressal Cell.
- 2) Consumer Grievances Redressal Forum.
- 3) Electricity Ombudsman.

In compliance of the the MERC (Consumer Grievance Redressal Forum & Electricity Ombudsman) Regulations, Regulation 3.2 :-

- MSEDCL has constituted the Internal Grievance Redressal Cell at all circle offices under all zone offices to redress the grievances of consumers under its jurisdiction.
- A Forum (C.G.R.F.) is established at all Zone offices of MSEDCL from year 2004 under compliance of section 42(5) of Indian Electricity Act 2003 for redressal of grievances of consumers and to work in accordance with the

guidelines as specified by Maharashtra Electricity Regulatory Commission as per section 181 sub clause (r) & (s) of the Act.

- If aggrieved by the order of the Forum, consumer can refer his appeal with the Electrical Ombudsman, MERC .
- Further, MSEDCL is responding to the consumer complaints in time limit as prescribed by Maharashtra Electricity Regulatory Commission (Standards of Performance of Distribution Licensees, Period for Giving Supply and Determination of Compensation) Regulations, 2005 and thus providing satisfactory services to the consumers. Also, in case of default from MSEDCL to maintain time limit in resolving the consumer complaints, consumers has an opportunity to claim compensation from MSEDCL for delay in resolving the complaint.

## Load Management

- **Load & Demand Management measures :**

1. **Demand side management (DSM) schemes:**

To manage with the unfulfilled demand of electricity, MSEDCL has implemented following schemes:

- A) **Single phasing Scheme:**

The 3 phase availability of 8 hrs during daytime & 10 hrs during nighttime, is supplied to Gaothans in rotation. The 18 hrs of single phase supply is available for domestic purpose.

- B) **Gaothan Feeder Separation Scheme:-**

In this Scheme, separate feeders are laid for Gaothan (village) & Agricultural pumps so that the 3 phase availability of 8 hrs during daytime & 10 hrs during nighttime, is supplied to Ag. Pumps in rotation but separated Gaothan feeders have Groupwise load shedding as per Urban area.

The load relief of 1800 to 3500 MW is obtained through these two schemes.

2. **Short term measures :**

- a. Purchase of Day Ahead power from IEX, Medium & long term Power Purchase agreements.
  - b. Utilization of Koyna water at peak load period.
  - c. Overdrawal from Central Sector in cae of good frequency profile.
  - d. Diversity of peak load is achieved through Application of TOD tariff.

## Information Technology

### **Level of IT & IT initiatives in MSEDCL**

#### **Computerized Systems implemented in MSEDCL**

- a) HT Billing System
- b) LT Billing System
- c) Financial Accounting System
- d) Payroll
- e) CPF

- f) Board's Accounts ,H.O.
- g) Store Management System
- h) Loan Accounting System, H.O.
- i) E-Tendering Procurement & Works
- j) Consumer Monitoring System: This system has been developed for the Energy Audit of the Distribution Transformer (DTC).
- k) Financial Energy Management System: This system is developed for the Energy Accounting at the Feeder level, for calculating the losses.

**Mail Service: -**

To improve the communication system, MSEDCL has hosted a mail server at the data center and provided enterprise mail accounts to all of its 10000 engineers and senior officers.

**Intranet (WIKI) Application: -**

MSEDCL has setup an intranet application as a community portal for its employees, where the users can create their projects, manage their documents, create blogs etc.

**Consumer Services: -**

MSEDCL has developed software for its customers called "Consumer Facilitation Center (CFC)". This software has the features of "Single Window" Concept and is presently implemented at 45 CFCs. Out of these, 29 CFCs are at Sub Divisional level. At Divisional / Circle level, 16 Centralized CFCs are operational. This activity is totally out-sourced.

The key features of the CFC are-

- Attending Consumer complaints, Power Supply / Bills
- Assistance in new connections
- Change of Name etc.

**Centralized Customer Care Centre:**

A Centralized Customer Care Centre (CCC) has been established under RAPDRP Part 'A' at Bhandup has began operations since 01st Dec 2011.

The purpose of setting up the CENTRALISED CUSTOMER CARE CENTER is to improve the supply related/billing complaint handling processes of MSEDCL and enhance the customer servicing capabilities of MSEDCL.

The CCC established by MSEDCL is equipped with latest technology & multi skilled customer service representatives. CCC takes the complaints and feedback through Telephone calls. It takes the specified follow-ups with the customer and if required, with concerned office to the extent of completely satisfying the aggrieved consumers. This one point contact service has been made available to relieve the customer from the inconvenience of identifying the concerned offices, visiting or contacting offices to solve their grievances. CCC has been manned by trained and polite personnel, who are sensitive to customer needs.

**All Time Payment Facility: -**

For facilitating the consumers, 76 All Time Payment machines have been installed at different locations where the consumer can pay the bill round the clock.

**e-Bill & Online Bill Payment System: -**

Now consumers can register at MSEDCL's website [www.mahadiscom.in](http://www.mahadiscom.in) for e-Bill and get bills through email. Payment gateway service extended to all consumers of the state, including Agriculture consumers for on-line payment of bills.

Following are the various kinds of electronic payment options made available to the customers-

- 1) Through online Bill aggregator companies viz. Bill Desk, Bill Junction
- 2) ECS through HDFC Bank, Cosmos Bank, ICICI Bank
- 3) Payment through MSEDCL's website by Credit Cards/ Debit Cards and Net Banking from 45 banks
- 4) Through Mobile phone / IVRS / SMS

**Photo Readings: -**

In order to issue accurate bills to the consumer and to avoid reading-related disputes, if any, about the veracity of the reading, meters are read with the help of camera. The photograph of the meter, showing the recorded reading is printed on the bill. This also ensures that the consumer's premise is duly visited by the meter reader.

**Integrated ERP Solution:**

The integrated ERP Solution (Oracle Apps) is implemented in MSEDCL since June 2008. This system has got following modules-

- Scheme Planning
- Stores
- CPA
- HRMS
- Payroll
- Contributory Provident Fund System
- Asset Management System
- Vigilance
- Legal
- Estate Management
- Pole Factory
- Materials Management
- Labour & Industrial Relations

**New Connection Tracking system: -**

MSEDCL has developed software for tracking new electricity connections. This application will take care of the new connection process starting from application to the release of connection. This application will also take care of the meter inventory. The system is implemented since February 2010.

**Data Center & Communication Backbone: -**

MSEDCL has established Data Center in 2007-08 at Prakashganga, BKC, Mumbai and under R-APDRP Project it is upgraded to Level 3. Various applications like ERP, MIS, e-Tendering, Mail, Website, Data Warehouse, Intranet, security products, patch management system etc are deployed at the Data center.

**IT Centers: -**

At present 35 Circles IT centers are functioning. The de-centralized Billing System is implemented at these Centers. All the IT Centers are connected to the Data Center at BKC.

**HT/LT-V Meter Readings through MRI:**

Developed Software for generating meter readings soft file required for billing from the downloaded data through MRI.

**E-Tendering: -**

To increase the transparency in tendering process and reduce the time required in the process, a computerized E-Tendering system for works, contracts and projects is introduced at all Circles for their O&M works. E-Tendering for supply of material has already been implemented for Central Purchase Agency.

**IT Initiatives Under Implementation During 2011-12****R-APDRP:-**

Ministry of Power, Govt. of India, has launched the Restructured Accelerated Power Development and Reforms Program (R-APDRP) in the XI Five year Plan. Power Finance Corporation Limited (PFCL) has been designated by Govt. Of India as the Nodal Agency for the program.

The program spans from data acquisition at distribution level till monitoring of results of steps taken to provide an IT backbone and strengthening of the Electricity Distribution system across the Country under the program.

The objective of the program is reduction of AT&C losses to 15% in project areas. The program is divided into 2 parts Part-A and Part-B. Part- A will include projects for establishment of baseline data. Under the program, following modules are implemented, to get verified baseline AT&C losses –

- i. New Connection
- ii. Disconnection and Dismantling
- iii. Meter Data Acquisition System (AMR)
- iv. Energy Accounting
- v. GIS based Consumer Indexing, Asset Mapping
- vi. GIS Based Network Analysis
- vii. Customer Care
- viii. Customer Relationship Management
- ix. Web Self Service
- x. Portal & Document Management System
- xi. MIS - Business Intelligence - Dashboards
- xii. Integration Middleware for integrating the existing s/w systems viz. billing system, ERP HRMS, Payroll, Fix Assets, Materials Management, e-Tendering etc.
- xiii. Identity Access Management & System Security.

This program is being implemented for 130 towns in Maharashtra.

**Automatic Meter Reading (AMR)**

For taking automated meter readings of HT consumers, high value LT consumers, Distribution Transformers (DTCs) and Feeders in non-R-APDRP areas.



## ERP Solution

MSEDCL is implementing an integrated ERP SOLUTION for its core functions for improvement in operation efficiencies with respect to the finance, project functions and integrating with existing systems viz. Legacy Systems, Pre-ERP Systems, and Auxiliary Systems etc. The increase in efficiency will have a direct impact on the operations of MSEDCL with respect to the above mentioned functions.

The scope of work of this project primarily consists of:

- a. Providing and installing ERP package and related software licenses
- b. Implementation of ERP, Financial Accounting, Project Management and control
- c. Integration with existing MIS, R-APDRP Applications, SCADA and DMS [both of which are in the process of implementation under R-APDRP Part-A & other ancillary systems
- d. Revamping/Upgrading of existing Billing System to n-tier architecture and integrating with proposed ERP
- e. Enhancement and maintenance of MIS modules & other ancillary systems
- f. Development of custom application and its maintenance.

The modules covered under the scope of EPR project are-

- Financial Management (FI/CO)
- Stores, Inventory, Purchase (MM)
- Project Management Process (PS)
- Plant Maintenance (PM)
- Upgrading of Billing Solution to n-tier architecture
- Load Management including Load Analysis
- Contributory Provident Fund(CPF)
- Portfolio Management
- Quotation Management
- Distribution Franchisee
- Tariff Regulatory Cell

## SCADA / DMS (Supervisory Control and Data Acquisition / Distribution Management System)

The objective of reducing Aggregate Technical and Commercial (AT&C) losses in the project area can be achieved by plugging pilferage points, supply of quality power, faster identification of faults & early restoration of power, proper metering, strategic placement of capacitor banks & switches, proper planning and design of distribution network. The real time monitoring & control of the distribution system through state-of-the art SCADA/DMS system encompassing all distribution Sub-stations & 11 KV network would help in achieving this objective of R-APDRP. For deriving maximum benefits it is essential that necessary up-gradation of distribution S/S & 11KV network shall be carried out to meet the SCADA/DMS requirements. The augmentation /up-gradation of the distribution network for real time supervision & control mainly requires suitable compatibility of circuit breaker & switches, placement of RMUs and FPIs etc for effective monitoring & control. This augmentation / upgradation shall be considered under Part B of R-APDRP scheme. However, considering the growth & related network up-gradation, the full fledged SCADA/DMS shall be capable to meet the present as well as future requirements of the eligible towns for SCADA/DMS system under Part A of R-APDRP. The SCADA/DMS System will provide Real time monitoring & control, loss minimization/load balancing and considerable improvement in voltage/VAR profiles. It would also facilitate proper handling of loads while load shedding & restoration, efficient planning of network for future growth by using proven power system planning tools. All software applications & RTUs/FRTUs including

system sizing requirements for the same shall be considered in the SCADA/DMS system being procured under Part – A of R-APDRP.

### **Introduction of RF, IR & Prepaid Meters**

To minimized manual intervention in meter reading MSEDCL has introduced Infra-red (IR) meter in less populated area and Radio frequency (RF) meters in densely populated urban areas. To achieve interoperability among various meter manufacturers MSEDCL developed it's own IR meter protocol and used ZigBee 2007 pro simple metering cluster with MSEDCL specific cluster for RF meters. Also MSEDCL started using prepaid meters for second home, gated colony areas.

## **Internal Reforms & Quality Control**

### ***The best practices adopted by I.R. & Q.C. section***

Various initiatives under Internal Reforms programme are being implemented in MSEDCL from April 2003. The details of which are elaborated below:-

#### **Energy Accounting -**

- a) **Energy Accounting** :- Energy Accounting at Zone, Circle & Division level is being done & losses are monitored monthly.
- b) **Feeder Energy Accounting : (Metering and consumer metering)**
  - Feeder wise energy accounting in MIDC areas and Express feeders is being done monthly.
- c) **DTCs Metering & Energy Accounting.**

#### **Loss Level**

- All the above efforts are on regular basis resulting in reduction of Distribution losses as given below :

<b>Year</b>	<b>% Dist. Loss</b>	<b>AT &amp; C Loss</b>
2005-06	31.72 %	35%
2006-07	29.50 %	33.9%
2007-08	24.09 %	26.1%
2008-09	21.98 %	24.6%
2009-10	20.60 %	21.4%
2010-11	17.28 %	18.5%
2011-12	16.03 %	18.41%

## Infrastructure

### Introduction:

The Mahavitaran has been entrusted the work of distribution of electricity in the State of Maharashtra. After restructuring, a comprehensive review of the existing infrastructure was taken and found that there is an immediate need to upgrade the existing System, to make Capacity addition, to replace the deteriorated Structures and to adopt the latest technology in the good governance of the Company. Up till now our response has remained as reactive due to monopoly in the business. But due to the open access policy, we are subjected to competition. Thus major shift from the present mind set in the form of reactive to proactive is the need of the hour if we want to stay in the foray. This is really in line with our mission statement i.e. proactive Distribution network planning has become imperative.

### Objectives of Infrastructure Plan: --

The objectives of the Infrastructure Plan are:

- 1) Reducing AT&C losses,
- 2) Providing reliable and Quality Supply to the consumers,
- 3) Meeting the load growth,
- 4) Releasing the new connections Residential, Commercial, Industrial as well as Agriculture during the project years
- 5) Upgrading the existing deteriorated System and
- 6) Providing Administrative Support with latest Technology.

### Implementation Strategy:

Under Infrastructure development Plan the turnkey contracts has been awarded to the various contractors by the process of e-tendering. The works are under executions in 120 divisions of MSEDCL in phase wise manner.

### Salient features of the Implementing strategy:

#### 1 Preparation of detail Projects reports:

The division wise project reports have been prepared keeping in view the above stated objectives. The up gradation of existing System, Capacity addition including Substations and distribution networks are proposed by taking into consideration the load growth of particular area.

2 **MERC in-principle approval:** In principle approval are being sought to the proposal before execution of works.

3 **Financial tie-up with Funding agency and 20% Equity from GoM:** The financial tie has been approved through the financial institution with Equity from Govt. of Maharashtra.

4 **Tender Invitations and award of Contracts on turkey basis:** Tenders are being invited through the process of e-tendering and contracts are awarded to the eligible lowest bidder by verifying technical and financial capabilities.

5 **Monitoring the execution of projects through Projects authorities:** The project has been executed through independent authorities comprising of following hierarchy.

6

<b>Director (Projects)</b>	
<b>Executive Director (Projects)</b>	
<b>Chief Engineer (Infra)</b>	
(At Corporate office)	(On field)
<b>Superintending Engineer (Infra)</b>	<b>Superintending Engineer (Infra)</b>
<b>Executive Engineer --- 4 Nos</b>	<b>Assistant Engineer (Infra)</b>
<b>Junior Engineer ---- 4 Nos.</b>	<b>Junior Engineer (Infra)</b> ( At division level)

**7 Monitoring the Progress of works:** The progress of works and workmanship has been monitored by the various authorities of MSEDCL.

**8 Manner of Execution:**

7.1. All Plant and Materials supplied shall be manufactured, and all work to be done shall be executed, by the contractor in the manner set out in the Contract. Where the manner of manufacture and execution is not set out in the Contract, the work shall be executed in a proper, workmanlike and careful manner, with properly equipped facilities and non-hazardous Materials, and in accordance with recognized good practice.

All Plant and Materials provided by the successful bidder shall conform in all respects to the specifications of the tender documents, or better, and shall be subject to the approval of the Employer's Representative. The Contractor shall guarantee that all Plant, Equipment and Materials will be new and free from defects in materials and workmanship and suited for its normal operating conditions. It is expected that the Bidder shall quote for supply of equipment of best makes which conform to the highest national and international standards. In its offer, the Bidder should only consider makes from reputed manufacturers of equipment corresponding to the state-of-the-art technology and to the latest international / Indian standards. All Plant and Equipment supplied for sub-stations shall be designed so that the completed facilities will be compatible with future SCADA operating systems, irrespective of whether such requirement is specifically included in the Employer's Specifications or not.

7.2. **Approved Vendors:** Plant and Materials supplied by the appointed contractor from within India shall be procured only from Vendors, fulfilling the criteria for approval of vendors as provided by MSEDCL.

7.3. **Codes and Standards:** Wherever references are made in the Contract (including the Specifications and Drawings) to codes and standards in accordance with which the Contract shall be executed, the edition of the revised version of such codes and standards shall apply unless otherwise specified. During execution of the Contract, any changes in such codes and standards shall be applied after approval by the Employer.

7.4. **Design:**

The Contractor shall carry out, and be responsible for, final design of the Works, including any site surveys, subsoil investigations, materials testing, and all other things necessary for proper planning and design. Design shall be prepared by qualified designers who are engineers or other professionals who are knowledgeable about the requirements of the IE Rules 1956 and Electricity Rules 2005 and experienced in design of transmission and distribution systems. For each part of the Works, the prior consent of the Employer's Representative shall be obtained to the designer and design Subcontractor, if they are not named as such in the Contract. Nothing contained in the Contract shall create any contractual relationship or professional obligations between any designer, or a design Subcontractor, and the Employer.

The Contractor's responsibility for design will normally be limited to those activities which are necessary to comply with the requirements of Construction Documents. Final designs and construction documents will be based on preliminary designs provided by the Employer, and will usually include conducting the necessary surveys, site investigations, subsoil investigations and detailed designs for the following works:

- (i) finalization of alignments for new and/ or relocated sub-transmission lines;
- (ii) finalization of locations and layouts for DTCs;
- (iii) finalization of foundation designs and drawings for all structures;
- (iv) finalization of construction drawings for road crossings, railway crossings, river crossings, utility crossings, etc., as applicable;
- (v) any other designs that may be reasonably required for satisfactory completion of the Works;
- (vi) finalization of layout plans for new and/ or rehabilitated substation
- (vii) for re-conductoring works, assessment of the structural stability of existing supporting structures against wind, seismic forces and additional loads, and detailed design and construction drawings for any necessary strengthening and rehabilitation works; and

- (viii) finalization of site grading, architectural, structural, electrical and sanitary designs and drawings, etc., for new facilities, as applicable.

The Contractor will not be required to re-design or submit drawings for works that are already adequately covered by the Employer's Standard Drawings, nor will he be required to prepare new designs for Plant and Equipment that is adequately covered by the Manufacturer's Drawings. In case the Employer's Drawings contained in tender documents do not cover all of the Works that are required under the Contract, then the Contractor shall use the appropriate standard drawings issued by REC..

- 7.5. **Manufacturer's Test Certificates** The Contractor has to submit manufacturer's test certificates for all Plant and Equipment supplied under the Contract to the Employer's Representative prior to, or at the time of, delivery of such Plant and Equipment to the Site. Approval of the manufacturer's test certificates by the Employer's Representative will be a pre-condition to acceptance of such Plant and Equipment.

**7.6. Delivery to Site**

The Contractor has been responsible for procurement, insurance, transport, receiving, unloading and safekeeping of all Plant, Equipment, Materials, Contractor's Equipment and all other things required for the completion of the Works

**7.7. Inspection**

The Employer, shall be entitled, during manufacture, fabrication and preparation at any places where work is being carried out, to inspect, examine and test the materials and workmanship, and to check the progress of manufacture, of all Plant and Materials to be supplied under the Contract. The Contractor shall give them full opportunity to inspect, examine, measure and test any work at the factory, on Site, or wherever else carried out.

The Contractor shall give due notice to the Employer whenever such work is ready, before packaging, covering up or putting out of view. The Employer shall then either carry out the inspection, examination, measurement or testing without unreasonable delay, or notify the Contractor that it is considered unnecessary. If the Contractor fails to give such notice, he shall, when required by the Employer, uncover such work and thereafter reinstate and make good at his own cost.

The Contractor shall submit, within 14 days of signing the Agreement, the proposed Procurement Program of all necessary Plant and Materials to be incorporated in the Permanent Works, as well as the Contractor's Equipment necessary for construction, erection and installation, for approval by the Employer. Such Procurement Program shall be developed on a normally available commercial project management software showing detailed planning for placing of orders, inspection by the representatives of the Contractor, Employer as applicable, transportation plans and delivery schedules for all Plant and Materials to be incorporated in the Permanent Works essential for systematic and professional management of all construction works. The Employer shall scrutinize, modify if required and approve such proposed Procurement Program, in consultation with the Contractor, within 14 days of submission by the Contractor. If the Employer does not give its approval or objection within the stated period, the Procurement Program shall be deemed to be accepted. Nevertheless, any approval by the Employer, or failure to object to the proposed Procurement Program, will not relieve the Contractor of any of its obligations or responsibility under the contract.

The team constituted for carrying out material inspections at the manufactures site as per material specifications and Guaranteed Technical specifications specified in the tender documents

**7.8. Guarantee services**

The Contractor will be responsible for providing the Guarantee Services for the period of time as specified in the Tender (the Guarantee Period). During this period, the Contractor will be responsible to guarantee the completed Works against any defects in design, materials, workmanship and manufacturer's defects of the Plant and facilities under normal operating conditions, and to remedy any defects therein at his own cost so as to ensure that the facilities are kept in good and proper operating condition.

Also each of the following major equipments shall be guaranteed by the Contractor against design, manufacturing & workmanship for an additional period of time as specified in the tender (the guarantee period) from the date of commissioning of individual equipment:

1. Power Transformer
2. Distribution Transformer
3. Switchgear
4. Metering equipments i.e. C.T., P.T., Meter & Control cables
5. HT / LT Cables

During the Guarantee Period, the Employer, Employer's Representative and Contractor will conduct Quarterly joint inspections of the completed Works to determine if: (i) any defects in the design, materials, workmanship or manufacturer's defects have occurred; (ii) the facilities are being operated within their design and/or rated capacities; and (iii) the Employer is properly maintaining the completed facilities in accordance with the Manufacturer's recommendations and prescribed maintenance procedures. In the event that any defects in the design, materials, workmanship or manufacturer's defects are noted, then the Contractor shall be responsible to correct such defects in accordance with the applicable provisions.

In the event that it is found that the installed Plant and Equipment are being subjected to operating conditions that are outside their rated capacities (i.e., being subjected to sustained overloading or power surges that are outside normal tolerances), or that the Employer is not maintaining the Plant, Equipment and related facilities in accordance with the Manufacturers recommendations and/ or prescribed maintenance procedures, then the Employer will be responsible to take remedial actions to correct the problems. If the Employer fails to take necessary corrective measures within 3 months of the joint inspection, and the same problems are observed during the subsequent Quarterly inspection, then the Contractor will not be held responsible for any subsequent failure of any item of the Plant and Equipment which is attributable to abnormal operating conditions or inadequate maintenance.

#### **7.9. Liquidated Damages for Delay**

If the Contractor fails to comply with condition specified in the contract, the Contractor shall pay to the Employer the relevant sum stated in the Tender as Liquidated damages for such default (which sum shall be the only monies due from the Contractor for such default) for every week or part of a week which shall elapse between the relevant Time for Completion", or any extension to the Time for Completion made in accordance with the provisions of contract, and the date stated in the Taking-Over Certificate for the Works or the date stated in the last Taking-Over Certificate in cases where the works are taken over in parts or Sections; except that the total payment shall not exceed the limit of liquidated damages (if any) stated in the Tender.

The Employer has provided an Indicative Milestone Chart in Tender which broadly describes the monthly progress targets that the Contractor is expected to achieve in order to maintain the pro-rata progress that will be necessary to ensure successful completion of the whole of the Works within the scheduled Time for Completion. The Contractor will be responsible to develop his detailed Construction Program in accordance with the requirements and clearly describe the Milestones that will be achieved each month within the stipulated Time for Completion. The Milestones, as agreed and approved by the Employer's Representative, will form the basis for assessing the Contractor's progress during the Construction Period. The Employer's Representative will undertake comprehensive reviews of the Contractor's progress every month, measured from the Commencement Date, to determine if the Contractor has carried out the work in conformity with the approved Construction Program and agreed Milestones.

If, at any time during implementation of the Contract, before the Intended Completion Date has been reached, the Contractor's progress has fallen behind the scheduled progress and it becomes apparent that the forecast completion date is likely to be later than the Intended Completion Date, then the Contractor shall become liable to pay interim penalties for such default to the Employer at the rates stated in the Tender for each week or part of week of delay in achieving the agreed Milestone, and the Employer will be entitled to deduct such interim

penalties from the interim payments due to the Contractor. If the values of the interim payments are not sufficient to recover such interim penalties, then the Employer may, at his sole discretion, recover the outstanding amount of such penalties by invoking the Contractor's bank guarantee provided as a security deposit.

If the intended completion date is extended after the interim penalties have been paid, or if the Contractor makes good the delay in progress, the Employer shall correct any overpayment of the interim penalties by adjustment in the next interim payment certificate.

The Employer may, without prejudice to any other method of recovery, deduct the amount of such penalties from any monies due, or to become due, to the Contractor. In the event of an extension of time being granted, the amount due shall be recalculated accordingly, and any over-payment refunded. The payment or deduction of such penalties shall not relieve the Contractor from his obligation to complete the Works, or from any other of his duties, obligations or responsibilities under the Contract.

At any time after the Employer has become entitled to liquidate damages, the Employer's Representative may give notice to the Contractor, requiring the Contractor to complete the Works within a specified reasonable time for completion. Such action shall not prejudice the Employer's entitlements to payment and to terminate

**7.10. Suspension of Work**

The Employer's Representative may at any time instruct the Contractor to suspend progress of part or all of the Works. During suspension, the Contractor shall protect, store and secure such part or the Works against any deterioration, loss or damage.

**7.11. DEFAULT OF CONTRACTOR**

a. Notice to Correct

If the Contractor fails to carry out any of his obligations, or if the Contractor is not executing the Works in accordance with the Contract, the Employer's Representative may give notice to the Contractor requiring him to make good such failure and remedy the same within a specified reasonable time.

b. Termination

The Employer may, after having given 14 days' notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site. The Contractor shall then deliver all Construction Documents, and other design documents made by or for him, to the Employer's Representative. The Contractor shall also remove from the Site, without delay and at his own cost, all materials, plant and equipment which have not been incorporated into the Permanent Works and commissioned and accepted by the Employer. The Contractor shall not be released from any of his obligations or liabilities under the Contract. The rights and authorities conferred on the Employer and the Employer's Representative by the Contract shall not be affected.

The Employer may upon such termination complete the Works himself and/or by any other contractor. The Employer or such other contractor may use for such completion so much of the Construction documents, other design documents made by or on behalf of the Contractor, Contractor's Equipment, Temporary Works, Plant and Materials as he or they may think proper. Upon completion of the Works, or at such earlier date as the Employer's Representative thinks appropriate, the Employer's Representative shall give notice that the Contractor's Equipment and Temporary Works will be released to the Contractor at or near the Site. The Contractor shall remove or arrange removal of the same from such place without delay and at his cost.

c. **Appointment and Award of contract at the risk and cost of existing contractor:** If the contract of the existing contractor has been terminated, the contract may be awarded to other contractor at the risk and cost of the existing contractor.

**7.12. Payment procedure :**

- a) 70% Progressive payments against cost of material and civil work commensurate with the progress achieved for supply and civil works, erection/ installation and successful completion of the complete works and submission of the completion certificate for that Works duly signed by the Contractor's representative, and the concerned Assistant Engineer or a person authorized by the Zonal SE (Infra).

- b) 20 % payment shall be made after rectification of all the defects, submission of compliance report, completion of guarantee tests & commissioning, submission of handing over & taking over certificate issued by the concerned Assistant Engineer, submission of all the as built drawings and equipment test reports. However in actual practice, 10% or 5% amount shall be hold up, out of 20% claim till the finalization of Price variations/ Quantity variation/ Liquidated Damages for delay if applicable.
- c) Balance payment i.e. 10% retention amount shall be released upon successful completion of the entire works and completion of all the Contractor's obligations under the Contract, as duly certified by the Employer's Representative and after issue of the last completion certificate and submission of a "No Claim Certificate" by the Contractor

## **9 Appointment of third party for Inspection of quality of works and workmanship:**

The third party inspection agency has been appointed to carry out the inspection of quality of materials, works, workmanship and standards as per MSEDCL specifications, relevant electricity rules, any other duty assigned by the MSEDCL authorities not limited to the activities mentioned if so assigned, verification of final quantity of materials utilized at the specified random site.

The main objective of appointing Third Party Inspecting agency is

- A. To ensure quality of works and workmanship executed by contractors engaged by the Maharashtra State Electricity Distribution Co. Ltd. under Infrastructure development plan during execution or after completion.
- B. To inspect quality of materials, works and workmanship of the various works under project,
- C. Standard being followed by the turnkey contractors as per specifications and relevant electricity rules.
- D. BOQ verifications
- E. VIP reference/complaints received relating to quality of works.

The project covering the work for supply, test, transport, construction, erection, testing and commissioning of sub transmission lines, power transformers new substations, augmentation of existing substations, distribution transformers of various capacities, renovation and modernization works in various divisions of MSEDCL in Maharashtra state.

**Remarks:** Keeping in view the objectives and the following the above stated implementation strategies; the Infrastructure plan has made the milestone achievement of projects in Maharashtra State Electricity Distribution Co. Ltd.

### **R-APDRP**

Restructured Accelerated Power Development And Reform Programme (R-APDRP) is a prestigious programme of Gol. This programme covers Town having population of 30000 as per census 2001. The Focus of this scheme is on establishment of baseline data and Fixation of Accountability and reduction of AT&C losses through strengthening and upgradation of sub-transmission and distribution network and adoption of information technology. However in Maharashtra 130 Towns are selected for this scheme. This scheme is executed in two parts i.e, Part-A and Part-B.

Under Part-A, the work of establishment of baseline data and IT applications for Energy Accounting/Auditing and IT Based consumer service Centres are under progress i.e. Asset Survey Mapping is completed in 114 Towns, Consumer



Indexing is completed in 111 Towns, IT infra work is completed in 126 Towns and the work of Modem installation for AMR (Automatic Meter Reading of DTC, HT consumer, Feeder meters and Town boundary meters) is completed by 38 %.

However under Part-A, SCADA (Supervisory Control And Data Acquisition) scheme is under implementation. For this SCADA scheme, Towns having population of Four Lacks and Annual consumption of 350 MUs are selected. Accordingly 8 Towns are selected namely Amravati, Nashik, Malegaon, Pune, Sangli, Solapur, Kolhapur and Gr. Mumbai. Purpose of SCADA implementation is to monitor, Control and alarm plant or regional operating systems from a central location.

However in Part-B, the work of Infrastructure development is under progress which includes work of New Sub-stations, Renovation, Modernization and Strengthening of 11 kv level sub-stations, reconductoring of lines at 11 kv and below etc.

Through this R-APDRP scheme, MSEDCL's aim is

1. To bring the distribution network under normal loading ,
2. To provide better services to the customer,
3. and to bring down the AT&C losses below 15 % .

## Commercial

### I) Reduction in Losses :-

The MSEDCL has taken several initiatives for reduction of losses and the summary of AT & C Loss is as mentioned below :

#### AT & C Loss Reduction:-

Year	2009-10	2010-11	2011-12
% Distribution Loss	20.60	17.28	16.03
% AT&C Loss	21.40	18.45	18.41

#### Financial Turnaround:-

<u>REVENUE FROM FINANCIAL YEAR 2008-09 to 2010-11</u>			
<u>Rs in Crores</u>			
PARTICULARS	2008-09	2009-10	2010-11
<b>INCOME</b>			
Revenue from Sale of Power	23483	27642	33238
Other Income	1315	1146	1252
Revenue Subsidies and Grants	0	400	28
<b>TOTAL INCOME</b>	<b>24798</b>	<b>29189</b>	<b>34517</b>

#### 100% Metering of Consumers other than AG:-

Metered Consumers	Unmetered Consumers	Total
1,78,61,937	15,98,433	1,94,60,370

Note: Unmetered consumers pertains to Agricultural category only.

#### Reliability of Supply:-

Format for "Quality of Service (Standards of Performance) of Distribution Licensees"			
Licensee: MSEDCL			
1.0 Reliability Indices : As per Regulations no 10 of SOP			
1.1 Overall Performance Indices for the Company:			
Financial Year	SAIDI (Minutes)	SAIFI (No.)	CAIDI (Minutes)
2008-09	243.2	10.84	22.43
2009-10	307.19	12.28	25.01
2010-11	90.26	17.59	5.13

#### Steps Taken for Reduction of System Losses :-

#### Infrastructure Plan:

	Major Works	Physical Progress					
		Commisioned					
		07-08	08-09	09-10	10-11	11 - 12	Total
2.1	New Substations	13	20	30	165	261	489
2.2	Augmentation of Power T/F	33	50	53	146	97	379
2.3	Additional Power T/F	18	28	60	172	134	412
2.4	H T Lines	836.80	1255.20	2873.15	13908	16111	34984
2.5	L T Lines	804.09	1206.14	639.95	3734	4658	11042
2.6	DTCs	288	432	5578	29346	24258	59902
2.7	HVDS	0	0	823	5420	3948	10191
2.8	Pole Mounted Capacitors	0	0	195	1254	787	2236
	Major Works	Financial Progress					
		Expenditure					
		07-08	08-09	09-10	10-11	11-12	Total
2.1	New Substations	80.14	114.50	706.35	4352.45	3415.22	8668.66
2.2	Augmentation of Power T/F						
2.3	Additional Power T/F						
2.4	H T Lines						
2.5	L T Lines						
2.6	DTCs						
2.7	HVDS						
2.8	Pole Mounted Capacitors						

**R APDRP Scheme:**

**(Rs. in Crs)**

Sr No	Acitivity / Scope of Project		Cost of project	FY 2009-10		FY 2010-11		FY 2011-12	
				Achievement	Expenditure	Achievement	Expenditure	Achievement	Expenditure
1	DGPS	Asset Mapping	LOA for 212.05 Crs issued to M/s L&T for 95 towns and LOA for Rs 94.95 CRS issued to M/s SPANCO for 35 Towns	Nil as LOA was issued on 31.03.2010 to M/s L&T for on Implementation of R-APDRP Part A Project in 95 towns and on 13.10.2010 to M/S SPANCO for Implemenattauiion of R-APDRP Part A Project in 35 towns	Asset Survey Completed for 26 towns , Consumer Survey Completed in 14 towns satellite imagery received for 60 towns . Initial Design Documets approved for IT Center , Data Center , Dr Center CCC and Other Offices.	37.42	Asset Survey Completed for 112 towns , Consumer Survey Completed in 109 towns satellite imagery received for 125 towns . Data Center Ready , CCC Ready , all Software Modules approved , 30 towns integarted with Data Center , 29921 meters insatllaed with Meter boxes and and 20210 modems Installed	62.46	
2		Consumer Indexing							
3	DC ,CCC and Other Offices	IT Infra Material at Data Center , Disaster Recovery Center , CCC And Other Offices							
4		Modem Installation							
5	MDAS	Meters and Meter Boxes Installation							
6	S/W	Software Development of 13 Modules							
7	UAT	Town UAT							
8	Integartion	Integration with Data Center							

**RGVY scheme:**

**(Rs. in Crs)**

Sr. No.	Activity	Scope of work		2009-10		2010-11		2011-12	
		Coverage	Amount	Achievement	Expenditure	Achievement	Expenditure	Achievement	Expenditure
1	HT Line (kM)	5218.11	829.44	723.7	163.09	1518.02	261.1	418.25	53.74
2	LT Line (kM)	8506.01		1565.59		3355.74		1916.03	
3	DTC (Nos.)	8979		1672		3927		1084	
4	BPL Connections (Nos.)	1184415		411587		328971		133963	

**Theft Detection: FY 2011-12**

Raids conducted (Nos.)	Theft cases detected (Nos.)	Assessment amount (Rs. in Lakhs)	FIR lodged (Nos)	Amount realized (Rs.in Lakhs)	Compounding (Nos.)	Compounding Amount (Rs. in Lakhs)
719888	47633	4121.27	8611	2825.88	25625	1771.70

**II) Steps Taken for Reduction of Revenue Loss and improvement in Billing and Energy Accounting System:**

- R-APDRP Part A Project for 130 Towns

Implementation of Following software Modules

- 1) New Connection and Disconnection
- 2) AMR
- 3) Energy Accounting
- 4) GIS based Consumer Indexing, Asset Mapping & Network Analysis
- 5) Consumer Care and Customer Relationship Management
- 6) Web Self Service
- 7) Asset Management
- 8) Document Management System
- 9) Business Intelligence - Dashboards
- 10) Integration Middleware for Integrating the existing s/w systems viz. billing system, ERP HRMS, PayRoll, Fix Assets, Materials Management, eTendering etc.
- 11) Data Centre and Disaster Recovery Centre
- 12) Communication Back Bone 2 mbps connectivity upto section office

**III) Revenue Management:**

- Photo Meter Reading technology adopted for accurate billing.
- Automatic Meter Reading Technology adopted for High value consumers and feeders
- Meters with Infrared Ports
  - For Rural Area – Domestic & Commercial Consumers
- Meters with Low Power Radio Frequency Modems
  - For Urban Area – Domestic and Commercial Consumers
  - Frequency : Free 2.4 GHz Global Band at 250kbps
  - Protocol used for RF Modules IEEE 802.15.4 Standard ZigBee

- Pre-paid Meters
- Need of Common Protocol
  - MSEDCL developed Common Meter Protocol for HHUs with M/s Reliance and BEST for both IR and RF Meters
- Advantage of Common Protocol
  - Different Types of Meters – Single Phase, Three Phase
  - Different Make of Meters – Elster, Secure, L&T, Genius, PalMohan, HPL Socomec etc
  - Single Handheld Machine
- Damini Squad
  - Formed at each Circle level
  - Cross checking of meter reading activity
  - One lady engineer and two qualified ladies outsourced along with one security person and vehicle
  - Initially tenure was fixed for 3 months i.e upto 31.03.10
  - Subsequently extended upto 30.06.2012
- Participation of Mahila Bachat Gat in Photometer reading and bill distribution
- Six Nos. of Dedicated Police Stations for MSEDCL to deal with theft of electricity cases
- **Existing System Implanted at MSEDCL for Best Revenue Management**
  - Consumer Billing System (HT -15,500, LT-19,200,000)
  - Energy Accounting System ( Feeder wise, Feeder Energy Accounting, DT Energy Accounting)
  - Consumers Bill Payment System – on Website - Payment gateway
  - Online New Connection Tracking System

#### **Distribution Franchisee (DF) - Adopted**

##### ➤ **Bhiwandi**

- M/s Torrent power was appointed as distribution franchisee in Bhiwandi powerloom domination town. Distribution losses has been reduced from **44.5 %** in 2005-06 (prior to franchisee in operation) to **17.43 %** in 2010-11.
- Aurangabad div I & II, Mahal, Gandhibag, Civil lines, Jalgaon
- Recently Franchiseed out.

##### ➤ **Others**

- Few more areas where losses are high are being considered for distribution franchisee. ( Tender Selling for Thane – III Dn.- Mumbra-Kalwa) is in process.

## **Customer Care Service for better Revenue Management**

In addition to usual Bill Payment Facilities, following facilities are provided

- 24 hours bill collection machine installed at selected cities.
- On line payment through credit/debit cards, internet banking and through mobile phone.
- Help desk for facilitation of bill payment established at various locations.
- Payment of HT Consumers through RTGS.
- Centralized Customer Care Center (CCCC) has been started in Bhandup in the year 2011-12.
- Call Centres are established in 15 Municipal Corporation areas.
- Consumer Facility Centres have been established at Circle levels.

## **Corporate Finance**

The best practices, of Ensuring long term financial viability and sustainability –effective revenue management practices, used in MSEDCL regarding the same are as follows:-

The Energy Bill Collection work in respect of L.T. Consumers is being done through following outside agencies are as follows:-

1. Departmental Cash Collection Centers
2. Credit Co-operative Societies
3. Urban Co-operative Banks
4. District Central Co-operative Banks

In addition to this MSEDCL facilitate the consumers to pay the energy bill in the easiest and fastest mode. To more convenience MSEDCL has introduced the other bill collection facilities than above mentioned. The new types of Collection mechanism are as follows:-

### **1. Any Time Machines: -**

Any Time and Any Where, MSEDCL has also introduced ATP Machine (Any Time Payment) throughout Maharashtra in order to pay the energy bills. In first phase there are 76 ATP machines installed during the month of March 2012. Presently, there are more than 2 Lakhs consumers are availing the benefit of this service and MSEDCL is collecting on an average Rs. 28 Crs. per month. Further, in 2<sup>nd</sup> Phase 50 ATP machines are likely to be installed by June 2012.

### **2. On-Line Energy Bill Collection:-**

MSEDCL introduced On-Line Energy bill collection Mechanism in July 2010. Presently, there are more than 4.6 Lakhs consumers are availing the benefit of this service and MSEDCL is collecting on an average Rs. 51 Crs. per month.

**3. Post Offices:-**

MSEDCL has started the bill collection through various Post offices including their Sub Post offices, Branch Post Offices and Head Post offices. More than 5000 Post offices are collecting MSEDCL bill at their respective offices. It is helpful in rural part of Maharashtra. Presently, Post office collecting on an average Rs.37 Crs. per month.

**4. E-Maha Seva Kendra:-**

In the year 2009-10, the Govt. of Maharashtra had launched a scheme of Maha e-Seva Kendra Project/Common Service Center (CSC) scheme under the aegis of the National e-Governance Plan (NeGP) of Government of India. A Service Center Agency (SCA) has provide services such as collection of Municipal Tax, Telephone Bills and Electricity Bills at Village level. Therefore, MSEDCL started the LT electricity bills through this CSC centers in most of part of Maharashtra. Presently, there are more than 60,000 consumers are availing the benefit of this service and MSEDCL is collecting on an average Rs. 2 Crs. per month.

**5. Mobile Bill Pay Facility:-**

In the year 2011, MSEDCL started the bill collection through Mobile Network. Consumer simply downloaded software and make payment from anywhere and any time. Presently, there are more than 300 consumers are availing the benefit of this service and MSEDCL is collecting on an average Rs. 3 lakh per month.