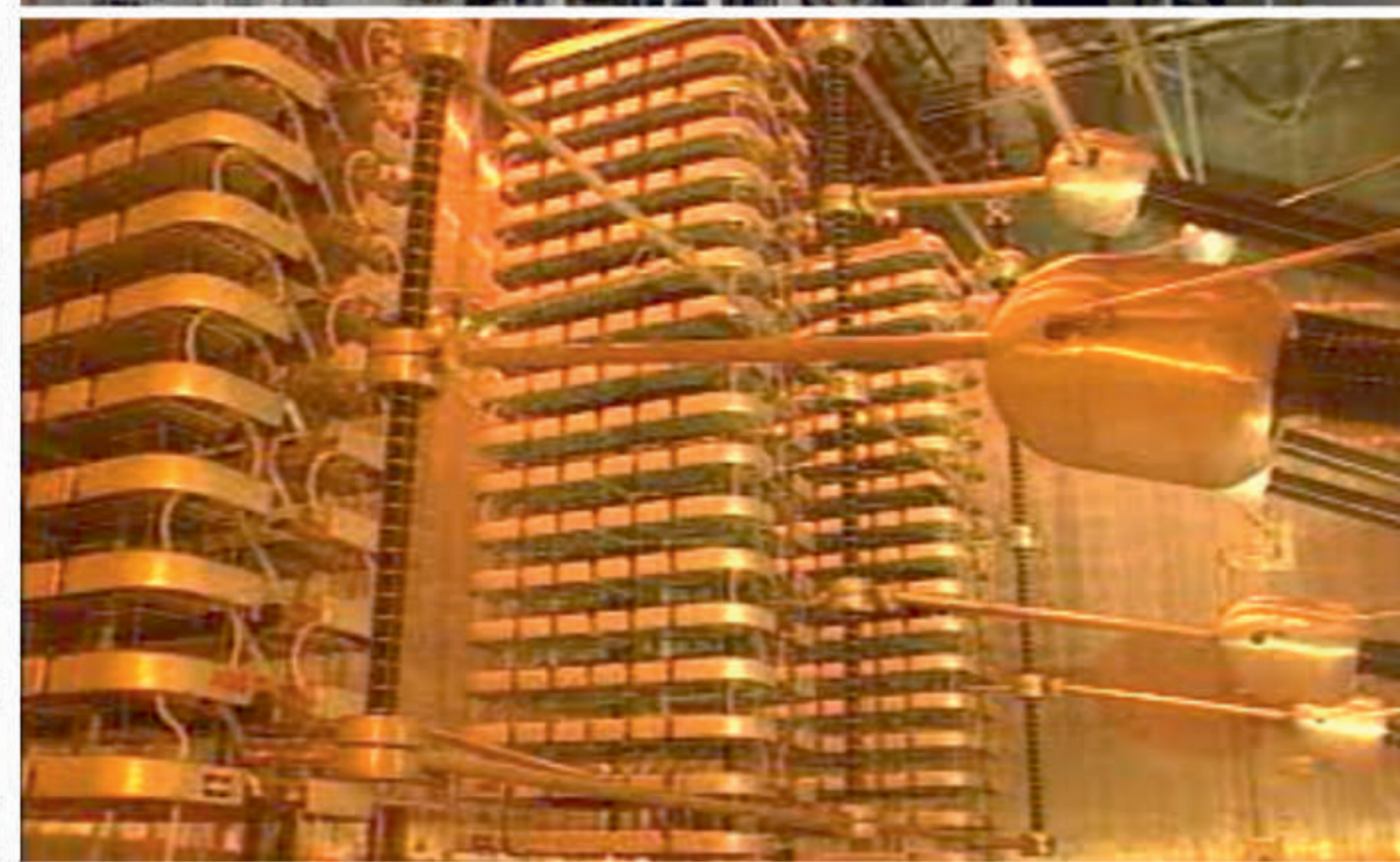
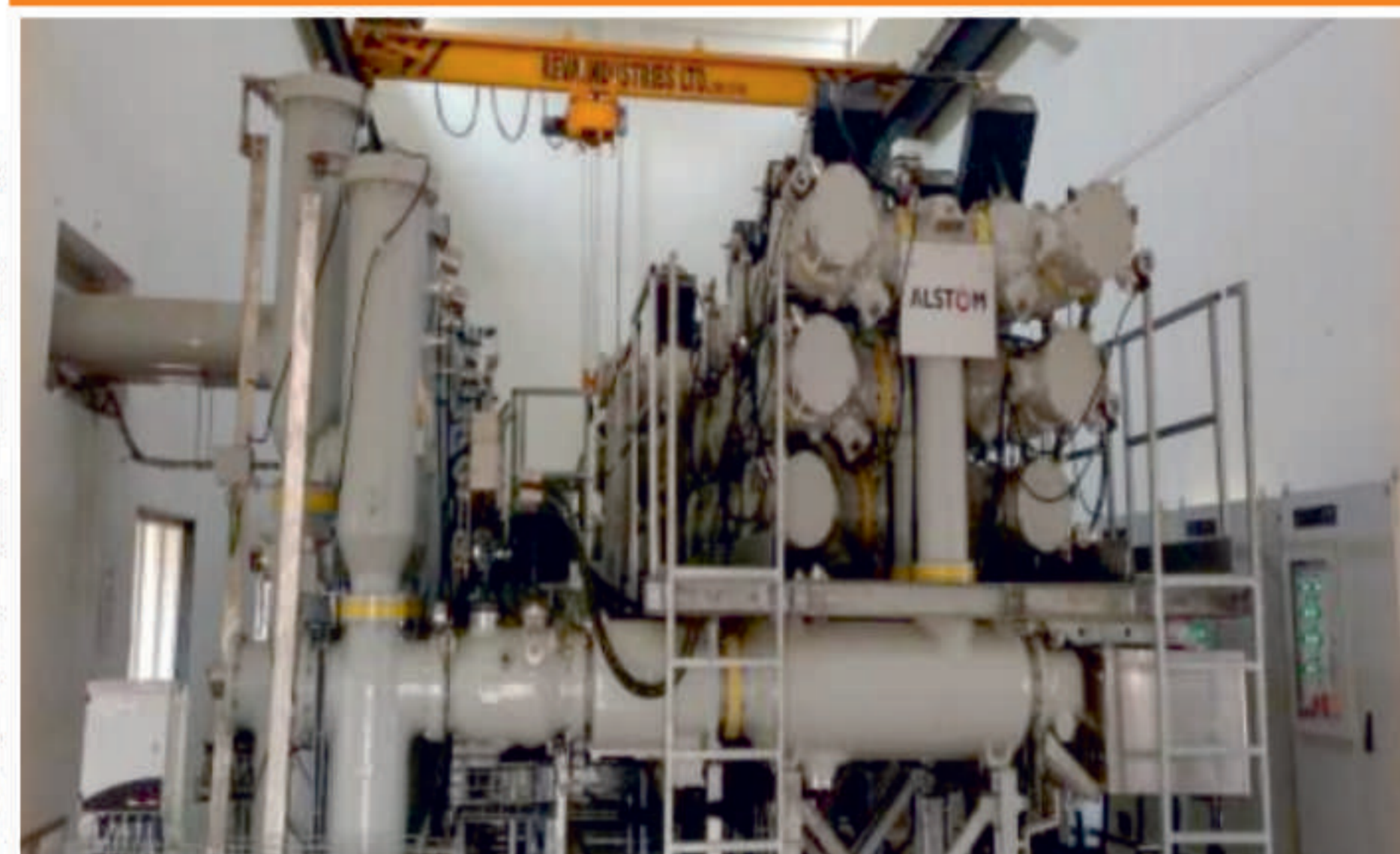




Visit us at :  
[www.mahatransco.in](http://www.mahatransco.in)



Prakashganga, Plot No. C-19, E Block, Bandra Kurla Complex, Bandra (E), Mumbai - 400 051.  
Website : [www.mahatransco.in](http://www.mahatransco.in)



**A Towering  
Presence**



**Maharashtra State Electricity Transmission Co. Ltd.**

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## OUR FUTURE VISION

1. Use of High Ampacity Conductors
2. Substation Automation / Digital Substations
3. Remote Operations
4. Drone based O & M survey
5. Hot line works with bare hand method (Live Line Works)
6. Reactive Power Management
7. Integration of Renewable with forecasting of Renewable Energy
8. Energy Auditing
9. Effective Network Planning
10. Laying of OPGW on all transmission network about 45000 Km. for effective & fast Communication & Data transfer
11. Assets Management
12. Renewable Energy Management Centre (REMC)
13. Automatic Demand Management System (ADMS)

# MESSAGE FROM THE CHAIRMAN & MANAGING DIRECTOR

With the introduction of reforms in the power sector, the scenario for all state Owned Electricity Enterprises has undergone a dramatic change. To ensure that the on-going process of transformation is not a temporary phase, but if sustainable, MAHATRANSCO is considering a number of new initiatives in transmission technology, project implementation and HR Management.

Some of the initiatives that we have embarked upon appear yielding positive results. We are monitoring this very carefully to be able to ensure institutionalizing them for the benefit of all Stakeholders.

Together with organizational changes, MAHATRANSCO is making an endeavor to be more transparent, more accountable and more responsible to its Stakeholders, both internal as well as external. We also welcome feedback from our Stakeholders in this regard.

We have a gigantic task ahead of us, in terms of system and infrastructure up gradation as well as of creating fresh infrastructure to be able to meet the future requirements of the state. Growth in various sectors of Maharashtra should not face bottleneck

due to lack of electricity. We estimate that this will translate into an investment plan of about Rs. 8000 Crores. MAHATRANSCO is the largest State Electric Power Transmission Utility in the country.

## **Our Corporate Mission and Vision encapsulates the following**

- ❖ To establish ourselves as a model STU and transmission licensee with respect to
  - ♦ Planning,
  - ♦ Project Implementation,
  - ♦ Operational Capabilities,
  - ♦ Performance
- ❖ with emphasis on
  - ♦ Cost and Quality consciousness,
  - ♦ Human Resource Development,
  - ♦ Corporate Social Responsibility

**Rajeev Kumar Mital, IAS**  
Chairman & Managing Director, MSETCL

## MAHATRANSCO IN NUTSHELL

- The largest electric power transmission utility in state sector in India.
- 633 EHV substations.
- 43730 CKms of Transmission lines.
- 110814 MVA Transformation capacity.
- Infrastructure plan of about Rs. 8000 Crore.
- Transmission system capable of handling 20000MW of power.
- Transmits around 141766 MU of electricity annually.
- Staff Strength of around 16672 employees all across Maharashtra.

## MAHATRANSCO

A Link between

**MAHAGENCO & MAHADISCOM**

MSETCL Functions as



Transmission Licensee



State Load Dispatch Centre (SLDC)



State Transmission Utility (STU)

# OVERVIEW OF MAHATRANSCO

Maharashtra State Electricity Transmission Company Limited (Mahatransco) was incorporated in June, 2005 consequent to the restructuring of MSEB. MAHATRANSCO is today a duly registered company under the Companies Act.

This wholly owned corporate entity under Maharashtra Govt. commenced its operations in Fiscal 2005 as part of an initiative of the Government of Maharashtra to consolidate and organize Generation, Transmission and Distribution Segments as separate commercial entities.

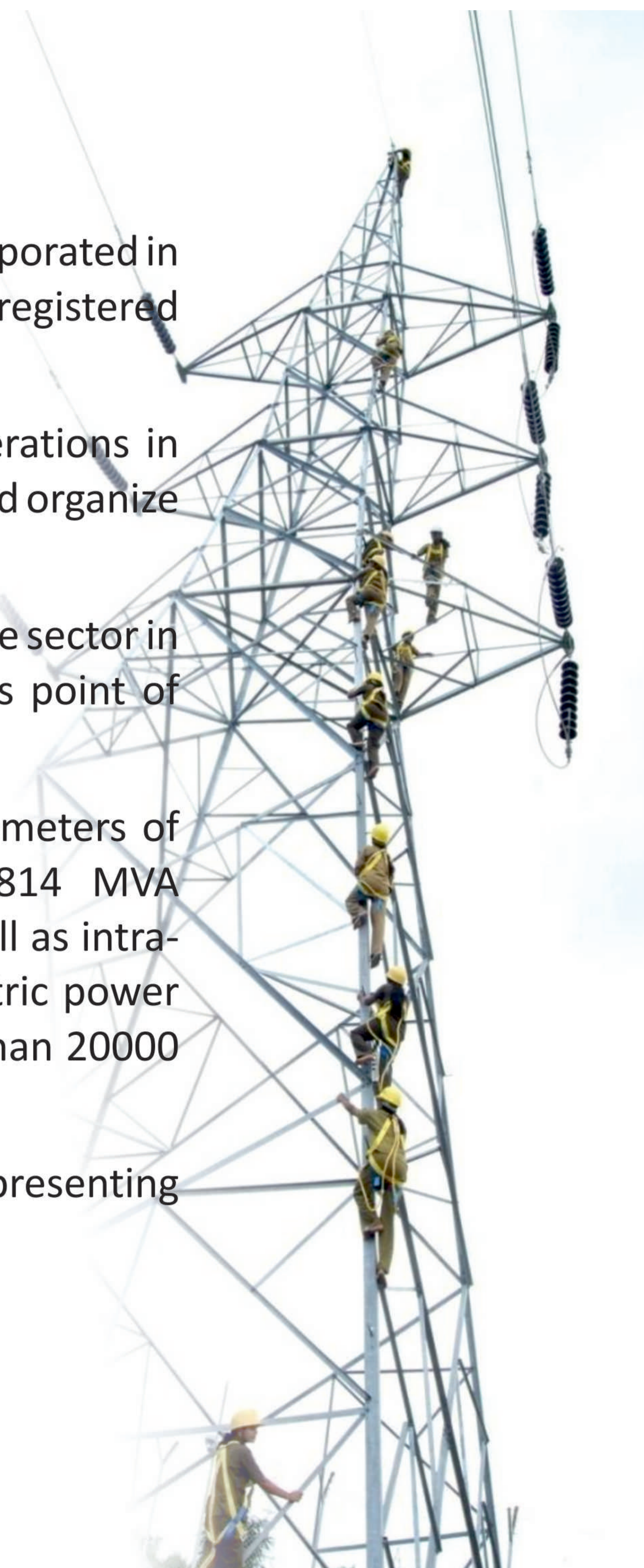
Mahatransco is one of the largest electric power transmission Utility / Company in State sector in India. We are responsible for the evacuation & transmission of electricity from its point of generation to the point of distribution across the state of Maharashtra.

Our huge infrastructure includes a vast transmission network of 43730 circuit kilometers of electrical transmission lines and more than 633 EHV substations with 110814 MVA transformation capacity. This infrastructure constitutes most of inter-regional as well as intra-regional electric power transmission system in Maharashtra State and carries electric power across the same. Mahatransco's transmission system is capable of handling more than 20000 MW of power as of today.

In Fiscal 2015-16, we transmitted approximately 141766 Million units of electricity, representing approximately 12% of all the power generated in India.

## **The power transmitted during the last three fiscals:**

Year	Power Transmission (MU)
2013-14	122291
2014-15	135372
2015-16	141766



# OUR MISSION AND VISION

**To establish ourselves as model STU and transmission licensee with respect to planning, project implementation, operational capabilities, performance with emphasis on cost and quality consciousness, human resources development and corporate social responsibility.**

## Our Corporate Objectives And Goals

MAHATRANSCO has already undertaken key initiatives to align its long term vision to the changing business requirement.

In order to be able to translate this Mission and Vision to tangible reality, we at MAHATRANSCO have set for ourselves certain clear Organizational Goals and Objectives.

- To make network development and investment plans for an Intra-state transmission system that is secure, reliable and economical, through constant research, be able to develop best-in-class system study and system planning capacities within the organization.
- To ensure proper health and safety of our employees as well as safety and stability of the grid.
- To develop a State-of-the-art SLDC with corresponding Communication Systems, RTU & SCADA systems, information and knowledge management systems as well as enhancing our employees operational, supervisory and managerial skills.
- To reduce energy losses.



## OUR INSTITUTIONAL OBJECTIVES AND GOALS INCLUDE

- Fulfilling all statutory and regulatory codes, standards, directives and targets in relation to planning, network development, operations and services.
- Ensure safety during operations, maintenance and construction activities.
- Setting and achievement of a set of targets (financial and non-financial).
- Keeping track of state-of-the-art technology in the areas of sub-station design, construction, protection, communication, sub-station design, construction, protection, communication, maintenance, information systems, diagnostics, repair, restoration and life extension.



- Developing a management culture of care, trust, transparency and open communication.
- Establishing a strong ethos of work culture, quality consciousness and high performance across the organization.
- Creating a feeling of professional and organizational pride and strong bonding among different functional groups and cadres.
- Acting with a sense of social responsibility towards consumers, project affected persons, less privileged sections of society and the environment



**Sub-Station Switchyard**



**Insulator Replacement**



**Hot-Line Maintanance**



**Sub-Station**

## MAHATRANSKO'S ROLE IN ECONOMIC DEVELOPMENT OF THE STATE

Maharashtra occupies a prominent position in Industrial India. As growing economy with healthy growth rate for the last decade, it has a strong industrial base, a well developed infrastructure and is one of the most favoured investment destinations today.

The Mahatransco's transmission system is presently capable of handling bulk power which is available for the State.

In doing so, it fulfills three key roles:

- ❖ Transmission of electricity from generation sources to load centers i.e. mainly Mumbai, Thane, Pune and Western Maharashtra.
- ❖ Provides reliable power which is also secure.
- ❖ Facilitates competition, and ensures secure and reliable supply to consumers.

In order to meet the growing demand of electricity, a substantial growth in electricity generation capacity is needed over the period of next 10 years. Considering the planned expansion in generation capacity and the anticipated load growth corresponding to rapid industrial growth in Maharashtra, the State needs robust and vibrant Transmission network. Mahatransco, has therefore embarked upon a very ambitious plan for expansion and up-gradation of its transmission infrastructure by 2020 to handle such a large amount of power.

The role played by MAHATRANSKO is and will be critical to the development of Maharashtra.



**Monopole**



**Cable Termination Tower (Multicircuit)**



**A.C Switch Yard in HVDC Terminal Station Chandrapur**



**765KV. ICT Aurangabad**

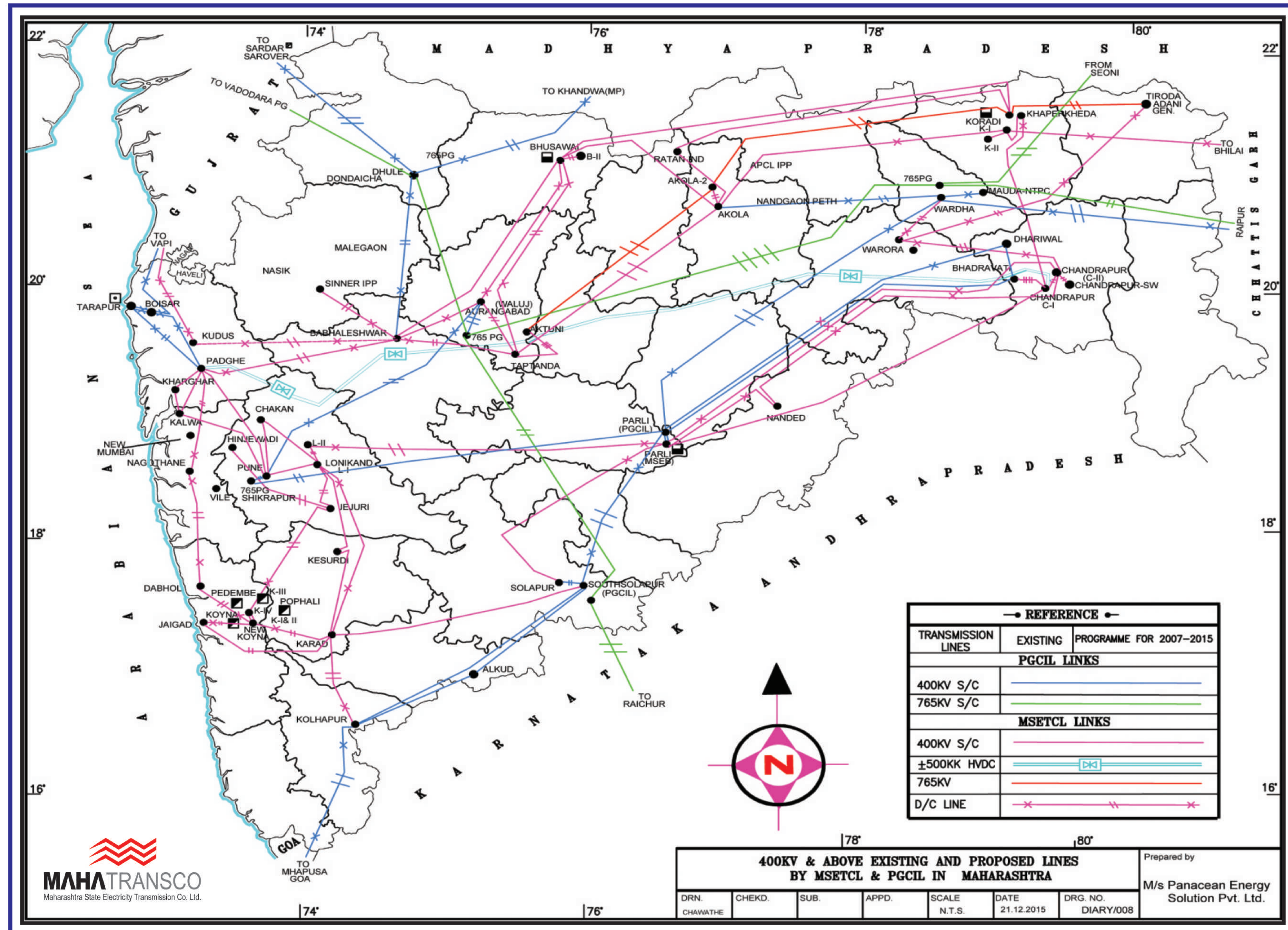


**Converter Transformer at HVDC Station Chandrapur**

## MAHATRANSCO'S OPERATIONAL HIGHLIGHTS

- MAHATRANSCO owns and operates 633 EHV substations with a transformation capacity of 110814 MVA at 7 EHV levels from 66 KV to 765 KV.
- On an average, the company transmits 141766 MU of electricity annually. The company covers a transmission length of 43730 Ckt Km of EHV lines.
- The company also has the distinction of being the only power transmission utility in the state sector to own a HVDC bipole link.
- The company operates a 752 km long, 1500 MW, +/- 500 KV bipolar HVDC line from Chandrapur to Padghe in Maharashtra.
- MAHATRANSCO has SLDC at Kalwa near Mumbai and area Load Despatch Centre at Ambazari near Nagpur.
- In FY 2015 - 16, MAHATRANSCO transmitted 141766 MUs of Electricity as compared to that of 135372 MUs in the previous year. For the same period, the Transmission System Availability for EHV AC system was 99.72% as compared to 99.73% in the previous year.
- Last five year average Transmission System Availability for EHV AC system is 99.72% Last five year average HVDC System Availability is 96.99%.
- The Transmission losses of the Company during 2015-16 were 3.92%; which are within Regulatory benchmark of 4.85%.

# OUR NETWORK



## OUR NETWORK

MAHATRANSCO wheels about 12% of the total power generated in the country and major portion in the State of Maharashtra on its transmission network.

We have a transmission network that is spread across the state of Maharashtra with around 43730 Circuit Kms of transmission lines and 633 nos. of EHVAC & HVDC sub-stations with a total transformation capacity of 110814 MVA.

This network also provides the ring main system around major cities like Pune, Thane (Kalwa), Aurangabad, Nasik and Nagpur at EHV level. Ours is the largest transmission network of all the States of India. The +/- 500 KV, 1500 MW Chandrapur – Padghe HVDC Link is the unique feature of Maharashtra state system in the country. This HVDC corridor of 752 KM is very crucial link between Eastern and Western Maharashtra for transmission of bulk power.

Voltage level	2011-12			2012-13			2013-14			2014-15			2015-16		
	EHV S/S	Transformati on Capacity (MVA)	EHV Lines (CKT KM.)	EHV Substation	Transformati on Capacity (MVA)	EHV Lines (CKT KM.)	EHV Substation	Transformati on Capacity (MVA)	EHV Lines (CKT KM.)	EHV Substation	Transformati on Capacity (MVA)	EHV Lines (CKT KM.)	EHV Substation	Transformati on Capacity (MVA)	EHV Lines (CKT KM.)
765 KV													1	1500	0
500KV HVDC	2	3582	1504	2	3582	1504	2	3582	1504	2	3582	1504	2	3582	1504
400KV	22	18180	7406	25	22280	7567	26	22280	7468	27	22080	7891	28	23395	8225
220KV	171	39383	13209	182	43208	13851	193	45733	14588	198	47398	14942	211	49748	16326
132KV	260	21634	12073	271	24219	12776	282	25555	13313	299	26312	14165	306	26779	14554
110KV	34	2674	1724	34	2674	1724	34	2699	1738	35	2280	1737	36	2280	1737
100KV	36	2587	686	36	2610	697	37	2610	697	37	2628	698	38	2678	701
66KV	34	1139	3270	34	1144	3270	34	1144	3270	11	178	1523	11	853	684
<b>TOTAL</b>	<b>559</b>	<b>89179</b>	<b>39871</b>	<b>584</b>	<b>99717</b>	<b>41389</b>	<b>608</b>	<b>103603</b>	<b>42578</b>	<b>609</b>	<b>104457</b>	<b>42460</b>	<b>633</b>	<b>110814</b>	<b>43730</b>

## INFRASTRUCTURE PLAN

### MSETCL –Five Year Plan (2016-17 to 2020-21)

Sr. No.	Particulars	2016-17 (Proposed)	2017-18 (Proposed)	2018-19 (Proposed)	2019-20 (Proposed)	2020-21 (Proposed)	Total
1	New Substations	15	17	21	24	24	101
2	a) MVA addition due to new s/s	2650	3250	5000	6650	3650	21200
	b) MVA addition due to additional transformers	1840	1650	500	400	100	4490
	c) MVA addition due to replacement of transformers	675	0	850	0	0	1525
	<b>Total MVA addition (A+B+C)</b>	5165	4900	6100	7050	3750	26965
3	EHV Lines (Ckm)	2171	2154	1695	1991	1726	9738
4	<b>Capital Expenditure</b>	<b>1668</b>	<b>1836</b>	<b>1887</b>	<b>1317</b>	<b>1449</b>	<b>8157</b>

# INFRASTRUCTURE PLAN

MAHATRANSCO has planned to establish a robust Transmission network with MVA addition of 26965 MVA by 2021. In view of this, MSETCL's STU department has prepared a Five Year rolling plan 2016-21 for establishment of S/S and Transmission lines from 132 KV to 765 KV level.

The cost of this infrastructure plan is estimated approx Rs. 8000 Crores. At the end of March, 2021, a total transmission system of 734 sub-stations, 53468 Ckt. KM lines and transformation capacity of 137780 MVA is envisaged that will be capable for handling a growing energy demand.

In order to achieve the target by 2021, it has become necessary to speed up the projects implementation so as to enable to keep the Transmission network ready by the time additional planned Generation capacity comes up.

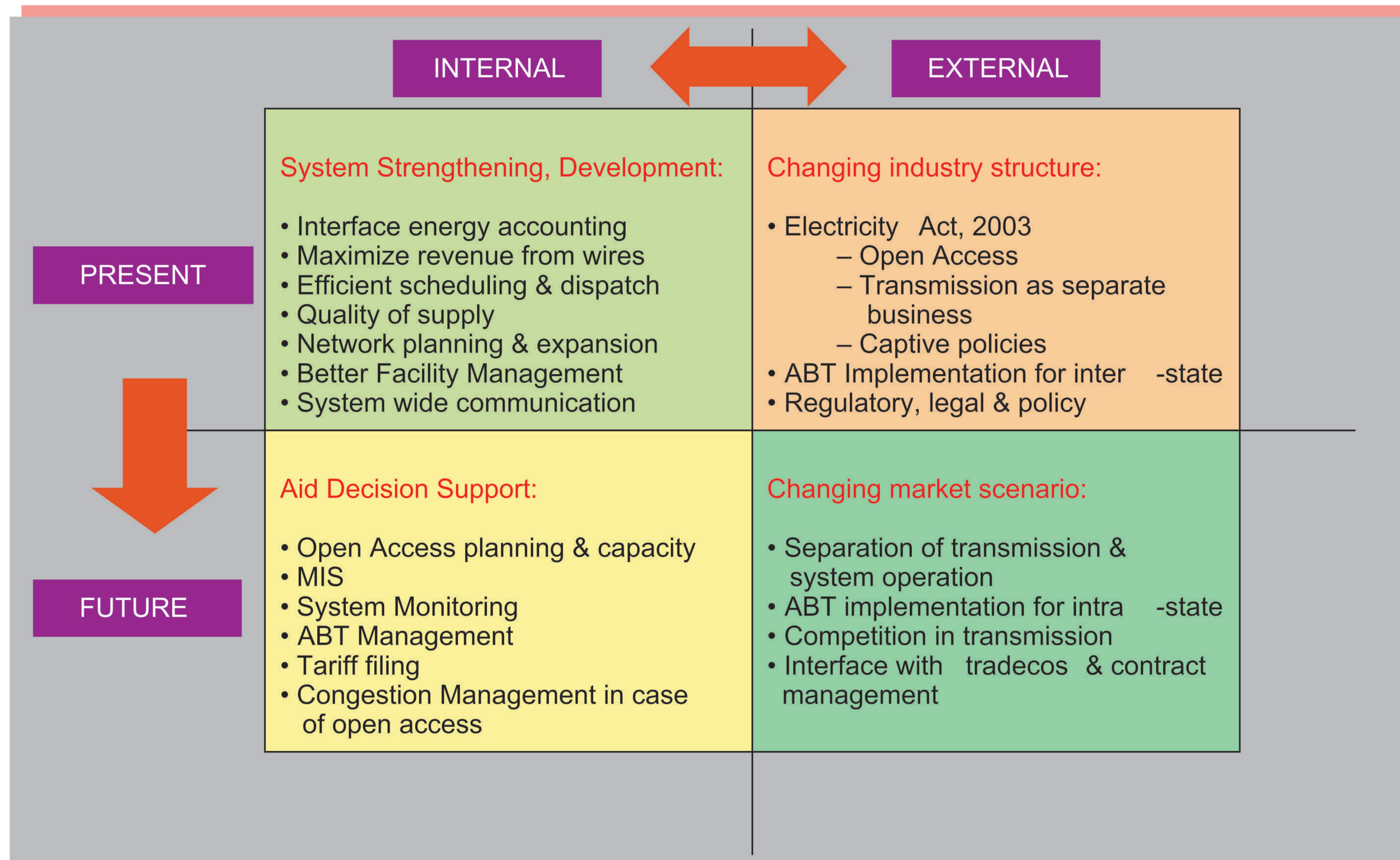
Further, MAHATRANSCO is required to ensure development of an efficient, co-ordinated and economical system of intra-state transmission lines, undertake transmission of electricity and to provide non-discriminatory open access to its transmission system on payment of specific charges for other utilities.

Taking into consideration the above, schemes are prepared on the basis of load requirement from MSEDCL, new Generation projects of MSPGCL / I.P.Ps, load flow studies and STU plan. With the implementation of the proposed schemes, MAHATRANSCO can ensure the availability, reliability and efficiency of transmission system by March, 2021 positively with a capacity addition to the tune of 26965 MVA and line of about 9738.61 CKms. spread over in the entire Maharashtra state.

## **Benefits of the Infrastructure / Investment plan as under**

- (1) Evacuation of power from all new generation projects (within state, outside state and central projects).
- (2) Establishment of robust transmission network.
- (3) Redundancy in transformer capacity and line.
- (4) Improvement in overall availability, reliability and efficiency of transmission system.
- (5) Facilitate open access in transmission sector within the state.

# MAHATRANSCO'S NEW ROLE IN THE CHANGING ENVIRONMENT (STU/SLDC/TL)



## MAHATRANSCO'S VALUED PARTNERSHIP: A GLIMPSE



Inauguration of 'Vendor's Meet' event held on 09.06.2016

Transmission Utility (STU) in India to promote, approach and to sign a JV for development of power evacuation system.

### **MSETCL-JSW Energy:**

To evacuate the power from the 1200 MW Jaigad Power Project, a Joint Venture arrangement between Mahatransco and JSW Energy reached with equity participation of 74:26% between JSW Energy and Mahatransco respectively. Jaigad Power Transco Ltd. a special purpose vehicle (SPV) was accordingly floated for the purpose of setting up Transmission Evacuation System consisting of 400 KV Double Circuit Transmission Lines from Jaigad to 400 KV Karad and New Koyna Receiving Stations of Mahatransco.

Incidentally, MAHATRANSCO becomes the first State

### **MSETCL- Sterlite Technologies Ltd. : Establishment of Comprehensive Communication Network for MSETCL through a Joint Venture**

To establish a reliable wide band back bone communication system ( Voice and Data) by laying OPGW cable network of 2801 kms which shall enable to provide high speed communication channels to State Load Despatch Centre for SCADA / EMS / ABT Metering / Video Conference and other IT applications required for control and operations of power system network of MSETCL.

MSETCL has approved the scheme for Establishment of Comprehensive Communication Network for MSETCL. In the meeting of Board of Directors it was decided to process the subject work on JV basis. According a JV Company Maharashtra Transmission Communication Infrastructure Limited (MTCIL) is formed.

## FUNDING ARRANGEMENT / INSTITUTIONAL BORROWING

MSETCL has submitted its Capital expenditure plan for FY 2015-16 to 2019-20 of around Rs.7875 crores to MERC.

Mahatransco has been earning profit since its inception i.e from 2005-06 onwards, after the trifurcation of the erstwhile Maharashtra State Electricity Board(MSEB).

In the financial 2014-15, Mahatransco has raised Rs. 638 Crore through debt. For the debt component, Mahatransco has tied up with the power Finance Corporation (PFC), the Rural Electrification Corporation (REC) and nationalized banks. MSETCL has earlier raised loans from International Agencies like the International monetary Fund and the Japanese Bank for International Co-Operation (JBIC).

### **MSETCL participation in Green Energy Corridor Project:**

MSETCL as a green initiative measure has participated in Green Energy Corridor Project. The Green Energy Corridor Project is a project which aims at synchronizing electricity produced from renewable sources, such as solar and wind, with conventional power stations in the grid.

During 12th Plan period, large scale renewable generation (Wind, Solar Power) is envisaged to come up in renewable energy potential rich states. For this Ministry of New & Renewable Energy (MNRE) of Government of India has undertaken a scheme namely “Green Energy Corridor”.

#### **GEC - I (Tranche-II) Scheme (MSETCL) :**

- No. of Transmission Elements - 27
- 220kV Lines - 190 CKm
- 132kV Lines - 783.36 CKm
- Additional Evacuation Capacity to be made available - 2570 MW
- Estimated Cost - Rs. 367 Crores

#### **GEC - II (Tranche-III) Scheme (MSETCL)**

On the lines of GEC (Tranche-II) scheme, GEC (Tranche-III) scheme has been prepared by MSETCL primarily for evacuation of expected Solar

Power generation.

#### **The details of the scheme are as under :**

- No. of Transmission Elements – 13
- 220kV Lines - 90 CKm
- 132kV Lines - 421 CKm
- No. of Substation - 1
- No. of ICTs - 2
- Addl. Evacuation Capacity to be made available - 1090 MW
- Estimated Cost - Rs. 275.7954 Cr.

## FINANCIAL PERFORMANCE

The total gross asset base of Mahatransco at the end of 31.03.2015 was Rs.21,064 Crores. The Company has delivered record performance across most of its operating indicators during 2014-15. Mahatransco's performance as per regulatory standards has also been excellent. For 2014-15 the profit of the Company was Rs. 1764 crore against Rs. 1703 crore in the previous year. Capital expenditure was pegged at Rs. 1419 Crore for up gradation for the transmission infrastructure. Assets increased by Rs. 1362 crore during 2014-15.

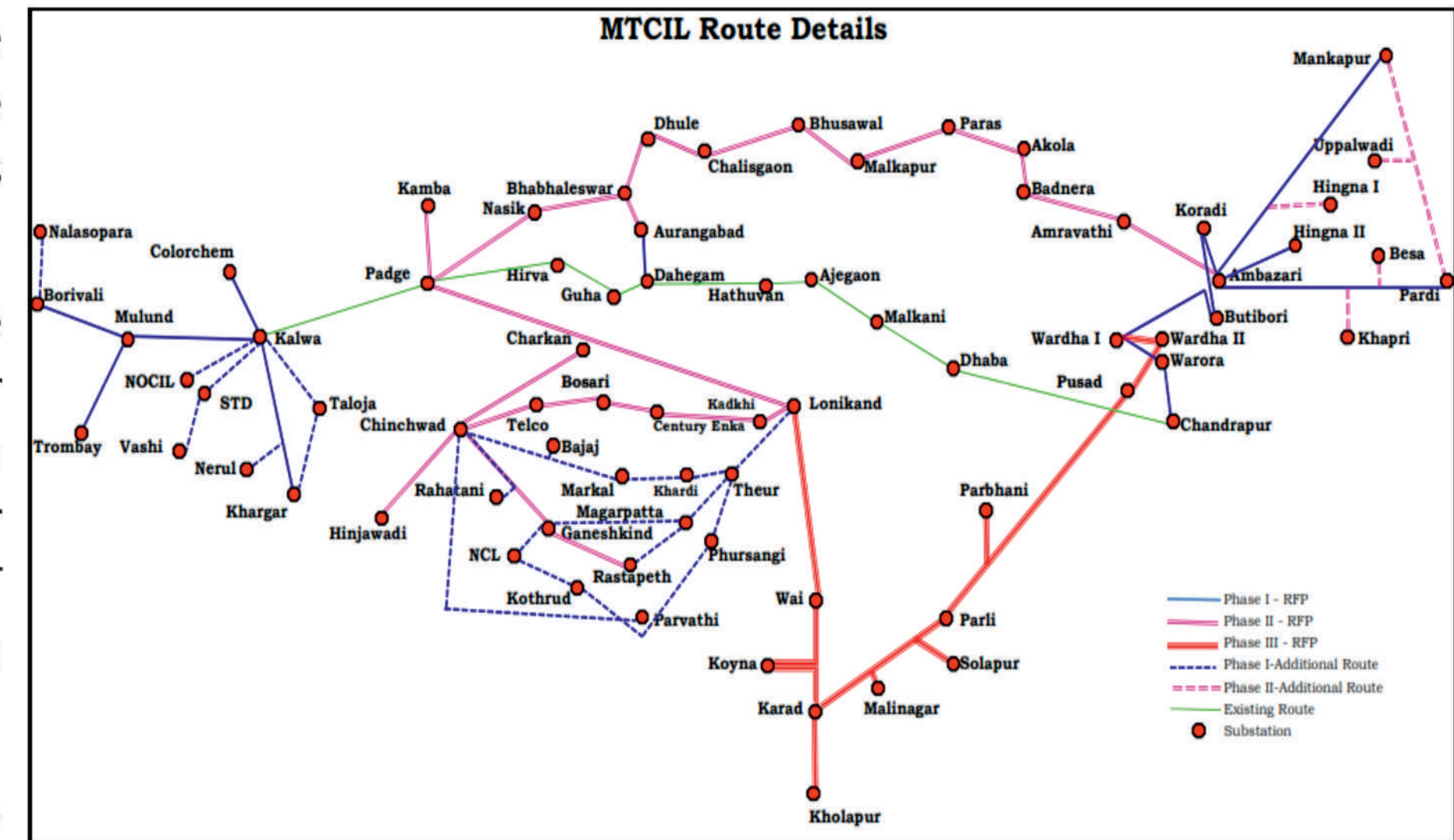
Just Like other power utilities in the country Mahatransco work under a regulated environment wherein 15.5% return on equity is allowed. But the company has been fairly successful in generating revenue from other source as well.



(Rs. In Crore)				
Particular	2011-12	2012-13	2013-14	2014-15
Receipt	2621	3671	5494	5432
Expenditure(incl. tax)	2051	2633	3791	3668
Net Profit	570	1038	1703	1764

# INTRODUCTION OF NEW CONCEPTS / TECHNOLOGIES

1. Mahatransco is one of the technology leaders in the country in the power sector. It is one of the first in the country and the only one among all the erstwhile Electricity Boards to establish a 752 Kms +/- 500 KV HVDC link.
2. Mahatransco has taken the initiative to establish a reliable wide band fibre optics communication system (voice and data) to cover 2801 Kms for Mahatransco. This shall enable to provide high speed communication channels to State Load Dispatch Centre for SCADA/EMS/ABT Metering/ERP/Video Conference & other IT applications required for control & operation of power system network of Mahatransco.
3. The Load Dispatch Centre is the nerve centre for operation, monitoring and control of the power system. To ensure integrated operation of the power system in the State and better control over the intra-state transmission system new state-of-the-art Real Time Data Acquisition equipments (RTUs/Data Concentrators) at substations and SCADA and EMS system are being installed.
4. In order to cope up with the modern IT enabling activities and to adopt the best industrial practices Mahatransco is implementing ERP in the Organization.
5. Establishment of compact Gas Insulated Substations (GIS) have been initiated at 400 kV Hinjewadi, Pune 220 kV Kondhwa, Pune 220 kV Bhandup, Mumbai and 132 kV Rastapeth, Pune.
6. Substation Monitoring System with Numerical Relays, Event sequence Recorders, Disturbance Recorders, Bay Controllers etc. are being implemented at important substations. SCADA with GPS is under implementation. Numerical UF cum FT relays are installed. Advanced computer software tools are being used for system studies. Numerical relays alongwith bay controllers and SCADA is now standardized for all EHV substations in the Company.
7. MSETCL is the first State utility in India having a network up to 765 KV transmission.
8. In order to have effective utilization of existing corridor Mahatransco has executed the following projects of High Temperature Low Sag (HTLS); 132KV Hingana- I Ambazari- Nagpur, 132 KV Deepnagar- Khadka Ckt I & II – Nashik.
9. RoW is a major challenge in the field of transmission of lines therefore Mahatransco has taken steps to reduce foot print through implementation of Monopole & Narrow Base Towers.



## HR INITIATIVES

MSETCL has a sanctioned staff strength of 16672 employees (as on 31- 03-2016) posted across the state in substations, project sites, division, circle and zone offices.

It is imperative and evident that our people are our most valuable assets. The HR Department of MSETCL strive to ensure that the workforce of MSETCL is developed and managed with utmost care to ensure superior performance of the organisation.

Some of the keys initiatives /interventions undertaken by the HR department in the recent past include:

### **Organization Restructuring**

In order to ensure role clarity and accountability and to align the organization structure to the business strategy and its process, the organization has restructured several of its departments. This includes creation of new functions such as:

- Projects (DCM & Scheme)
- Information Technology (IT) Cell
- Protection Automation & Communication Cell
- Vigilance & Security Department
- Revenue Officer for resolving RoW issues

### **Manpower Planning**

Considering the rapid expansion plans of MSETCL to add new substations and transmission lines, a manpower assessment exercise was carried out to develop norms for project execution and to estimate cadre wise requirements in the future. These norms are being reviewed periodically.

### **Recruitment**

MSETCL has been continuously recruiting employees in the technical, F&A and HR cadres through transparent and merit based system. The organization implements the reservation policy as per the specified Government norms.

# HR INITIATIVES

## Training & Development

MSETCL believe that every employee should be trained to build the required skill for superior performance on the job. In order to ensure this MSETCL has undertaken a comprehensive exercise to train employees as per National Training Policy. Training will be provided to all current and future incumbents based on the specific training. A comprehensive training plan manual has been prepared and budget has been allocated.

Training has already been provided in the areas of safety (including preparation of a Safety Manual), Project Management, Protection System and Testing etc. Induction training for Engineer is currently provided at Regional Training Centres. For specific training programs such as Hot Line training, employees are sent to external institutes such as NPTI, Bangalore. Also, for specialised technical training OEMs, and reputed Govt. Training Institutes are tried up. The Behavioural Training Programme for PG I & II officers are conducted through IIM, Ahmedabad and Power grid, New Delhi.

In order to build good training infrastructure internally, MSETCL is in the process of setting up its own Corporate Training Centre at Lonavala. Regional Training centres (RTCs) in the 7 zones have already been set up for training Operators and Technicians. All these RTCs are CEA recognized. Our Training has bagged Special Commendation National Award for Innovative Training Practices by ISTD, New Delhi. MSETCL conducts training Programmes for other Utilities and Institutions related to Power sector.

## Performance Management

In order to build a performance driven and transparent culture, MSETCL has migrated from a Confidential Rating system of performance appraisal based on KRAs and KPIs. This is especially important for creating ownership and accountability. Targets should be set against these KPIs and the individual would be assessed against these targets. This KPIs and targets would be cascaded from the organization goals to ensure that the individual performance is aligned to organisation's expectations.

This system includes a mechanism for open dialogue between the appraiser and appraise (reporting officer and subordinate) at the time of goal setting, mid year review and final assessment. The significant change in this system is that every employee would be aware of not only his performance rating, but also the basis on which it was arrived at.

## Building systems and processes for HR

In order to improve organisational efficiency, and ERP based system is implemented in MSETCL. Our system has bagged E-governance award of Maharashtra State.