



## Editorial Message

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Dear Reader,

Today, digitalization has become an integral part of our lives and is witnessed in varied sectors such as banking, retail, manufacturing and telecommunications. The adoption of digitalization has changed both individual and business paradigms. Around the world, utility companies are adopting digital technologies to improve efficiency and customer satisfaction.

By leveraging various blocks of digitization such as smart meters, application platforms and advanced analytics, Utility companies can understand energy consumption patterns of customers and then determine whether energy will be sold or bought, produced or consumed, delivered or stored.

For example, Smart Metering infrastructure can help companies to go through a digital transformation to leverage energy information for bill generation, notification, presentment and payment, as well as for outage management.

With increasingly affordable smart meters, IT infrastructure and ubiquitous connectivity, Digital transformation offers massive opportunities for utilities, but success will require significant investments by way of new talent and infrastructure, careful prioritization and a right implementation partner.

For effecting a successful transformation in the digitalization journey, the key element is selecting the right partner who can provide end-to-end solutions. Our expertise as a System integrator in Electrical, Automation & IT, enables us to deliver Integrated Solutions in various fields like smart metering, networking & communication, SCADA & IT applications. These contribute to greater capacity, higher performance and new functionality to control, I/O, communications, engineering, operations, safety and security.

In this issue of CANVAS, we have featured our recent MSEDCL success story and highlighted how our integrated ICT solution made a difference for our customer MSEDCL.

At this juncture, we are excited to share our solutions that will help Utility companies to create a blueprint, implement and maintain an array of solutions with innovative applications and smart devices.

One of the key topics we have covered in the Industry Trends section is Role of Advanced Meter Infrastructure and Peak Load Management in power distribution.

C&A is committed to delivering smart solutions that will help utilities to overcome evolving challenges and meet the present and future needs...

We hope you enjoy reading this issue of CANVAS..Happy Reading !!



J. K. Chattopadhyay



## The era of the smart utility

### Advanced Metering Infrastructure

Growth of any country is dependent on a variety of factors. One such important factor is Power. The Central Electricity Authority (CEA)'s latest Load Generation Balance Report, mentions India's current improvement in Energy and Peak deficit as 1.1% and 2.6% respectively, which is primarily due to slow industrial growth. The economy is expected to grow in coming years and this will stimulate growth in the industrial sector too.

Apart from variation in demand, India is also witnessing increased contributions through renewable energy and the government has ambitious plans to increase it still further. Increase in renewable generation, variation in demand and significant AT&C losses demand a robust and intelligent infrastructure to deliver power to

- Pre-paid metering

Advanced Metering Infrastructure has the capability to meet operational requirements, with its potential to develop and interface applications such as:

- Peak Load Management
- Outage Management

### Peak Load Management

Peak Load Management (PLM) is a very important issue for utility companies and can broadly be divided into two major categories:

Demand Side Management (DSM):

DSM programmes encourage the end user to be more energy efficient. DSM measures include lighting retrofits, building automation upgrades, re-commissioning, HVAC improvements, variable frequency drives, etc.

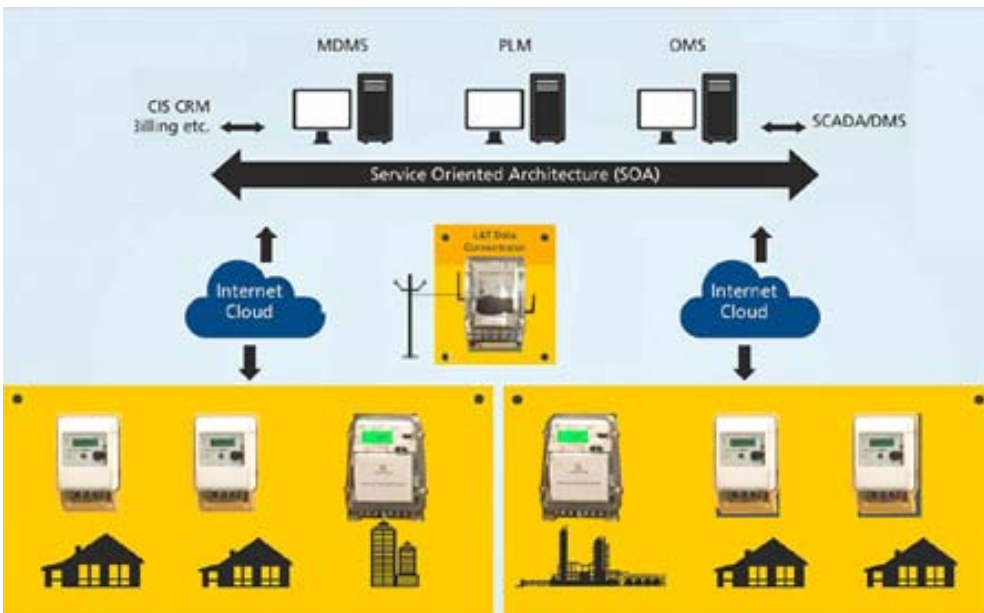
This is a relatively long term initiative to decrease growth in power requirement, which in turn will bring about a decrease in capacity addition.

### Demand Response (DR)

Demand Response (DR) is a term used for programmes designed to encourage end-users to make short-term reductions in energy demand in response to a price signal from the electricity hourly market, or a trigger initiated by the electricity grid operator during peak hours. Typically, DR actions would be in the range of 1 to 4 hours and include turning off or dimming banks of lighting, adjusting HVAC levels or shutting down a

portion of a manufacturing process. Alternatively, onsite generation can be used to displace load drawn from the electricity power grid.

The DR application takes inputs from load forecasting tools, SCADA and MDM as well as scheduling tools to determine deficit and surplus status, and based on this status information, it sends signals to the consumers using AMI and Mobile App. DR helps Utility companies to reduce overall energy costs and investment required for adding new capacity to serve peak loads.



consumers, which in turn necessitates the need for a Smart Grid.

Advanced Metering Infrastructure commonly known as AMI is one of the important elements of Smart Grid. The AMI includes Smart Meters, Meter Interfacing Unit (MIU), Meter Data Acquisition System (MDAS / Head-End System (HES) and Meter Data Management System (MDMS). The Advanced Metering Infrastructure enables the following functionalities:

- Remote meter data collection
- Time of day (TOD) metering
- Net metering
- Tamper and anomaly notification
- Connect/Disconnect
- Load Curtailment
- Possibility to upgrade firmware



# Making every Unit Count

## Integrated Solutions for Power Utilities



### About Us

Larsen & Toubro is an Indian multinational engaged in technology, engineering, construction, manufacturing and financial services. It operates in over 30 countries. A strong, customer-focused approach and the constant quest for top-class quality have enabled L&T to attain and sustain leadership in its major lines of business for over seven decades.

L&T's Control & Automation business offers integrated electrical and automation solutions to diverse industry segments, such as oil & gas, water, utility, minerals & metals, power, solar, automobile, chemical, pharmaceutical and infrastructure.

The business has served many customers with a complete range of electrical and automation solutions. It has a vast installed base in India. Its comprehensive portfolio encompasses instrumentation, electricals, drives, inverters, automation, SCADA, telecom and engineered IT solutions – all customised to the needs of its wide and varied client base.

The Company's expertise in automation, electrical and instrumentation, acquired over the years and domain knowledge enables it to offer distinctly superior and proven solutions.

### Smart Utility Solutions

The growing need for efficient power delivery drives utility companies to invest in enhancing existing infrastructure to ensure an efficient and reliable power ecosystem – from generation to consumption. This requires technological intervention in various fields like metering, networking and communication, SCADA and

IT applications.

To meet this objective, L&T is geared up to create a blueprint with utility companies, implement and maintain an array of solutions. L&T's solution brings energy efficiency to the grid, improves customer service and reduces duration of outages.

#### The solution comprises

##### Advanced Metering Infrastructure (AMI)

L&T's AMI offering includes Smart Meters, In-Home Display, RF and cellular communication infrastructure including gateways / data concentrators, head-end system, meter data management system and security solutions.

L&T provides reliable bi-directional communication enabling Connect, Disconnect, pricing information and peak event information. This benefits utilities as well as helps the end-consumer take informed decisions.

#### Key offerings:

- Smart Meters in-line with CEAs guideline (IS 16444)
- RF communication in ISM band (865-867MHz)
- Validate, Edit & Estimate (VEE) rule engine
- Service Oriented Architecture-based integration
- Load management based on business rules specially during peak loads situation
- Integration with other solutions like billing, consumer information system, outage management system, peak load

management system, etc.

## Operational Technology

L&T offers SCADA and DMS solutions to improve SAIFI and SAIDI for utilities. The key modules covered under these systems are Real Time data acquisitions and analysis, control of field electrical equipment, managing electricity flow and maintaining safety, load flow analysis, state estimation, demand forecast, fault location isolation and supply restoration (FLISR), etc.

Outage Management System (OMS) and Mobile Work Force Management System (MWFM) improve co-ordination and management of crew for better customer service.

### Key offerings:

- SCADA and DMS
- Integrated Outage Management and Mobile Work Force Management
- RTUs/FRTUs
- Geographical Information System

## Information Technology

IT plays a vital role by interfacing operational data with business systems. IT systems are deployed to manage large data, ensure data security and integrate with various sub-systems including legacy systems.

### Key offerings:

- Consumer Information System
- Consumer Relationship Management system
- Asset Management System
- Billing System
- Mobile App for consumers and utilities

## Solutions for Renewable Energy

With the growing mix of renewable energy into the grid, automation solutions are increasingly becoming essential. To meet the requirements of these green power solutions,

L&T offers:

### Key offerings:

- Integrated SCADA and generation forecasting to meet requirements of RE scheduling
- Special Energy Meters (SEMs) - based settlement solution
- SCADA system to meet requirements of integration and control of pooling substation
- Web portals, Analytics and Management Information System

### Key differentiators:

Leveraging its decades of experience in technology-based Systems Integration, L&T adds value to utilities, helping them to operate smart.

- Proven project management and execution capability to ensure delivery within the scheduled time and cost
- Unique strengths of Electrical, Automation and IT under one roof
- Domain knowledge acquired through rich experience with Indian utilities
- Flexible engagement model with vendor neutral solutions meeting customer requirements.

## Facility management Services

L&T offers Facility Management Services (FMS) to manage the asset's life cycle through product experts. The systems served vary from AMI, SCADA and DMS to large IT systems in the utility sector.

The services improve system availability and productivity, maximizing asset sweating. Our services start from the project implementation stage and are available until the end of life cycle and beyond through optimised migration plans.

### Key offerings:

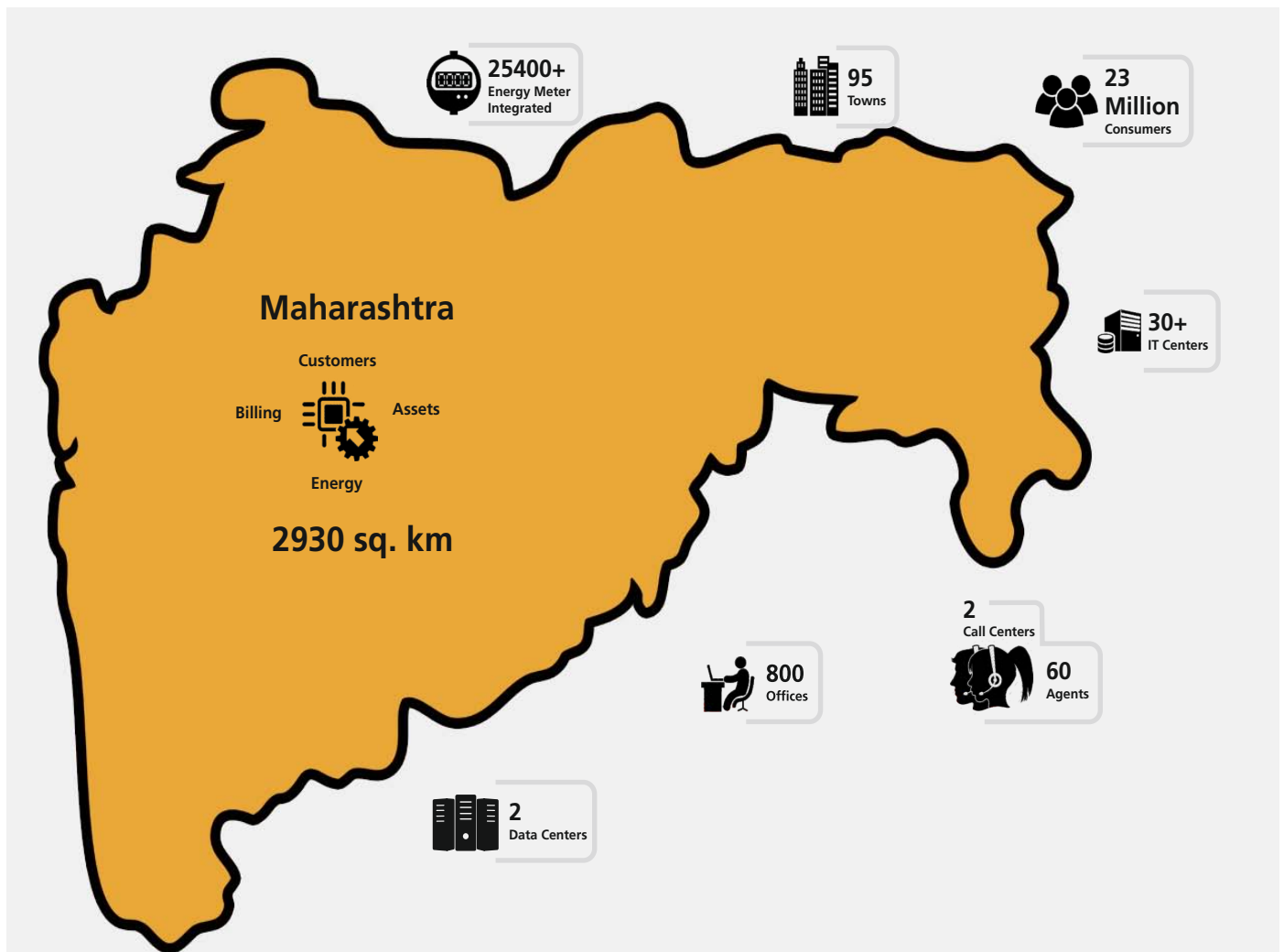
- Incident Management
- Call Centre and Help Desk
- Transition plan
- SLA Management
- Field Service Management





## Case Study

# L&T's solution helps to reduce distribution losses of India's Largest utility



### About Customer

Maharashtra State Electricity Distribution Company Limited, also known as MahaDiscom is a public sector entity under the Maharashtra government and the second largest electricity distribution utility in the world after the State Grid Corporation of China. It supplies electricity to a staggering 2.20 Cr consumers in Maharashtra across various categories spanning residential, commercial and industrial.

### Need

In India, the Distribution Sector is the revenue generating link in the chain of Generation-Transmission-Distribution. As compared to the performance of Generation and Transmission, Distribution is the weakest link in the power sector value chain due to high AT&C losses, inefficiencies and aging infrastructure.

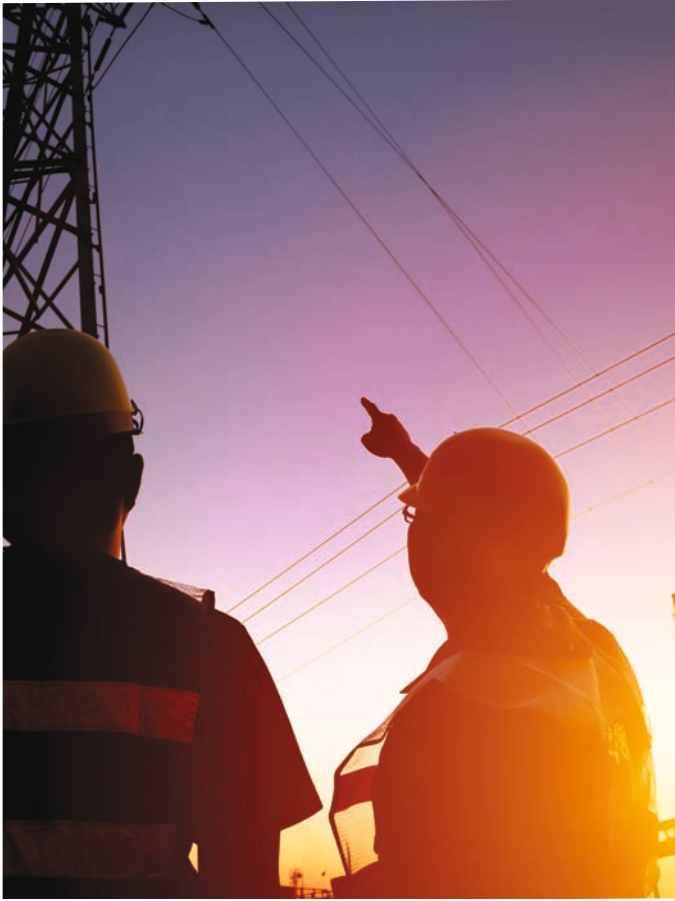
With a view to reducing the aggregate technical & commercial (AT&C) losses, the Government of India formulated a Restructured Accelerated Power Development and Reforms Programme (R-APDRP).

The focus of the programme was:

AT&C loss reduction, establishment of reliable and automated sustainable systems for collection of base line data, adoption of information technology in the areas of energy accounting, consumer care and strengthening of the Distribution networks of State Power Utilities.

### Solution:

C&A was awarded a contract by Maharashtra State Electricity Distribution Company Limited (MSEDCL), the largest power



distribution utility in the country for Information & Communication Technology (ICT) work in 95 towns of Maharashtra.

C&A competed against major market players and bagged this order in a limited tender. The project scope included :

- Setting up a Data Centre in Mumbai
- Setting up a Disaster Recovery Centre in Nagpur
- Setting up a Call Centre in Mumbai
- Development & Implementation of application software modules – Connection management, GIS, Network Analysis, CRM, Energy Audit, Identity & Access management, MIS & BI
- Installation of 25,400 modems for AMR (Automatic Meter Reading)
- Establishment of IT infrastructure & MPLS WAN in 810 offices in 95 towns
- DGPS based network and consumer survey covering an area of 25342 sq km
- Integration with legacy applications

The greatest challenges in implementing such a complex and enterprise-wide system are: timely execution, managing wide spread assets, scalability, and reliability, while minimising the administration and maintenance required for deployment and operation.

C&A's deep knowledge and understanding of the utility operations coupled with its project management skills/ expertise helped it to meet customer's expectations on outcome of the project. The project team worked closely with MSEDCL to deploy

various packages as per plan and helped the customer to improve its operational efficiency and reduce AT&T losses.

C&A also helped the customer to establish the baseline data of revenue and energy through its automated monthly Energy Audits & Management Reports. In addition to bringing in transparency, these excellent tools helped MSEDCL to strengthen its distribution network, streamline energy accounting and auditing, reduce AT&C losses and thus fulfil MSEDCL's vision of providing 24x7 power supply.

The project has also helped MSEDCL to implement various customer-centric processes like online bill payments, new connections, disconnections, meter change tracking, name or address changes, payment and consumer complaints and its status for all consumers across the state. Now consumers can receive their monthly bills via email by registering on MSEDCL's website. Consumers can register complaints / requests by contacting CCC's toll free phone number or website.

### **Highlights**

Under the programme, the following modules have been implemented, to get verified baseline AT&C losses

New Connection

Disconnection and Dismantling

Meter Data Acquisition System (AMR)

Energy Accounting

GIS based Consumer Indexing, Asset Mapping

GIS Based Network Analysis

Customer Relationship Management

Web Self Service

Portal & Document Management System

MIS - Business Intelligence – Dashboards

Integration with existing Billing, ERP, HRMS, SCADA and DMS

Identity Access Management

### **Benefits**

- Transparency across business processes
- Reduced business process cycle time
- Increase in consumer survey

The Maharashtra R-APDRP Part- A project is reckoned as one of the best executed projects amongst all the states of India and referred to as "benchmark" by PFC which is the Nodal Agency for this Programme of MOP.

On the auspicious occasion of Maharashtra Day - 1st May, 2014, the then Hon'ble Chief Minister of Maharashtra, Shri Prithviraj Chavan presented the First State eGovernance Awards to the best eGovernance Projects in Maharashtra State. The MSEDCL team was awarded the Bronze medal in the "Innovative use of IT in Governance" category for its Restructured Accelerated Power Development and Reforms Programme (R-APDRP) Part 'A' project.



## C&A receives ISGF Innovation Award 2017

Control & Automation (C&A), the Navi Mumbai business unit of L&T Electrical & Automation, ranked second in the 'Best Restructured Accelerated Power Development and Reforms Program (R-APDRP) Part A implementation in India - System Integrator' category of India Smart Grid Forum (ISGF), Innovation Awards 2017 organised by ISGF, a public private partnership initiative of the Ministry of Power (MoP), Government of India.

The Innovation Awards 2017 were introduced for the first time by ISGF to foster and recognise breakthrough innovations. Spanning ten nomination categories, the awards appreciate personalities, projects & products from utilities and technology companies that have set a new benchmark in Smart Grid and Smart City Segments.

C&A's successfully implementing Information & Communication Technology (ICT) work in 95 towns of Maharashtra as a part of R-APDRP qualified it for the award from amongst 12 contestants from various system integrator companies in India.

Mr. Richard Schomberg, EDF, consulting firm presented the award to Mr. Jayanta Chattopadhyay, Head – Control & Automation Business, at the Awards distribution ceremony held at New Delhi on March 9, 2017, to coincide with the 3rd edition of India Smart Grid Week (ISGW 2017), an International Conference and Exhibition on Smart Grids and Smart Cities held at New Delhi during March 7 – 10.



Mr. Rajendra Marathe & Mr. Jayanta K Chattopadhyay receiving the award from Mr. Richard Schomberg, EDF, consulting firm



# C&A showcases leading-edge solutions at Intellect 2017

Control & Automation (C&A) Business Unit of L&T Electrical & Automation (E&A) showcased its solutions at INTELECT 2017, the three-day Exhibition cum Conference organised by the Indian Electrical & Electronics Manufacturers' Association (IEEMA) during January 23-25, at the India Expo Center, NCR Delhi, with the theme 'Redefining Electricity for Smarter Living – Are you future-ready?'

The event being the first of its kind, integrated platform featuring smart electricity applications, technologies and systems for efficient use of electricity, 'all under one roof' attracted more than 100 exhibitors from across the world to discuss global best practices and seek solutions to some of the most pressing challenges in the field of intelligent electricity.

The exhibition was inaugurated by Mr. Piyush Goyal - Hon'ble Minister of State with Independent Charge for Power, Coal and New & Renewable Energy and Mines in the presence of Mr. Girish Shankar Secretary, DHI, Ministry of Heavy Industries & Public Enterprise, Mr. Desh Deepak Verma, Chairman Uttar Pradesh Electricity Regulatory Commission and other key dignitaries from IEEMA.

Mr. Sunil Agarwal, VP Power Grid Corporation and Director, National Smart Grid Mission, Mr. Atul Bali, DGM, National Smart Grid Mission and Mr. S.C. Bhargava, Sr Vice President & Head of E&A inaugurated the L&T stall on January 23, 2017.

Intelligent electricity is a key constituent of smart resource management solutions that power utilities are looking for. C&A

in collaboration with E&A's Metering & Protection Systems (MPS) Business Unit, put up an excellent display of their Smart Grid solutions that fulfil this need with robust performance and high reliability. The interactive display comprised of Smart Meters, Head-End System (HES), Meter Data Management (MDM) and Peak Load Management (PLM) required for building Advanced Metering Infrastructure (AMI) stack.

Also on display, was the Smart Panel, a solution for automatically switching between alternate energy sources like Solar and Grid electricity that facilitate maximum utilisation of renewable energy and which can be used in agriculture, water, domestic and industrial applications.

