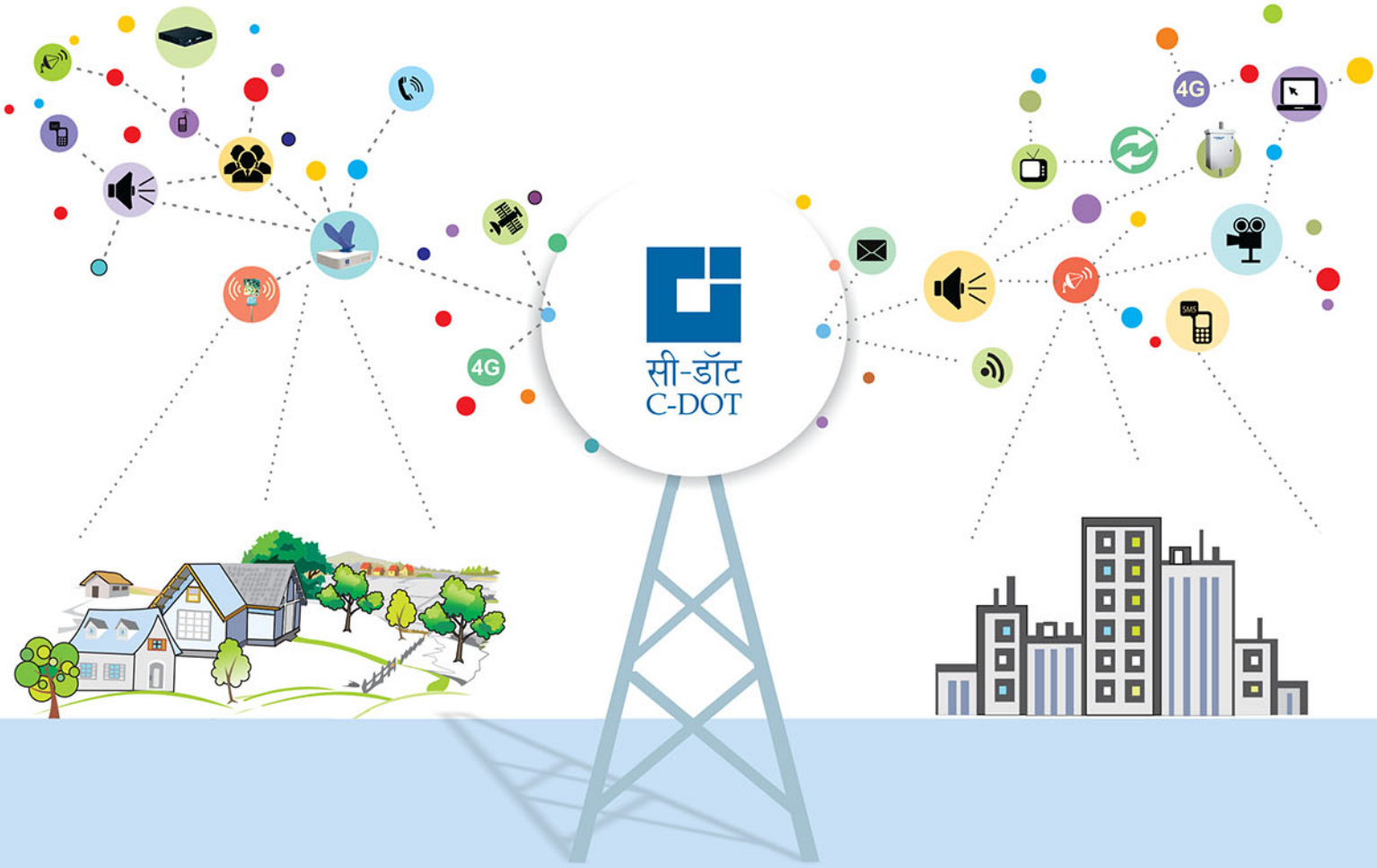
Annual Report
2014-15



Centre for Development of Telematics

(CMMI Level 5 organization)

सी-डॉट
C-DOT

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सी-डॉट
C-DOT

C-DOT Management

Governing Council

Chairman

Minister of Communications & IT

Vice-Chairman

Minister of State for Communications & IT

Members

Scientific Advisor to the Defence Minister
Chairman, Telecom Commission & Secretary (T)
Member (Technology), Telecom Commission
Member (Finance), Telecom Commission
Secretary, Department of Electronics and Information Technology
Chairman & Managing Director, BSNL
Executive Director, C-DOT
Directors, C-DOT

Steering Committee

Chairman

Chairman, Telecom Commission & Secretary (T)

Vice-Chairman

Member (Technology), Telecom Commission

Members

Chairman & Managing Director, ITI Ltd.
Director (Planning), BSNL
Sr. DDG, Telecom Engineering Centre
DDG (TPF), Department of Telecommunications
Sr. Director, Department of Electronics and Information Technology
Executive Director, C-DOT
Directors, C-DOT

Project Board

Chairman

Executive Director, C-DOT

Members

Directors, C-DOT

OVERVIEW

C-DOT, India's premier telecommunications R&D centre, has been a pioneer and a nation builder. Committed to providing a wide range of indigenously developed, cost-effective, state-of-the-art total telecom solutions, it has come a long way since its inception 31 years ago.

In the eighties, C-DOT developed rural telecommunication products ideally suited to Indian conditions. Capable of working without air conditioning, the C-DOT Rural Automatic Exchanges (RAXs) acquired legendary status for their ruggedness and reliability. Starting from the single mission of providing a dial tone, C-DOT has grown, over the last 31 years, to the level of a national centre for Research and Development in telecommunication technology in many areas viz. Satellite communications, Intelligent Network (IN), Asynchronous Transfer Mode (ATM), Dense wavelength division multiplexing (DWDM), Network Monitoring System (NMS), Broad Band Wireless Terminal (BBWT), Gigabit Passive Optical Networks (GPON), Next Generation Network (NGN) and Mobile Cellular systems.

Our ATM technology is in use for onboard communications in Indian Navy ships. C-DOT's indigenously developed Gigabit Passive Optical Network (GPON) technology is the infrastructural backbone of the prestigious Pan-India Optical Fibre Network, Bharat Net, thus poised to play a significant role in extending the the broadband pipes to every nook and corner of the nation.

C-DOT's Broad Band Wireless Terminal (BBWT) provides a cost-effective solution for extending the IP connectivity to remote and rural areas through wireless network. It can also be used for creating Backhaul links for Wi-Fi hot spots, cellular base stations and base station controllers, ATMs, Database servers etc.

There is a huge amount of information available on the Internet. Unfortunately, the rural populace is not able to avail the huge benefits of this vast pool of information due to various limiting factors viz. illiteracy, language etc. Designed to bridge this digital divide between urban and rural India thus boosting the Digital Empowerment, C-DOT GyanSetu enables the personalized access of various e-governance services including e-health, e-education, e-mandis etc. delivering the targeted content to the users including the visually impaired and specially abled, in the vernacular languages in audio, visual and text formats.

The SG-RAN product, based on sharing of active GSM infrastructure, can bring affordable mobile telephony to the rural market. The MAX-NG is breathing fresh life into the fixed line infrastructure of the country by bringing new service features to POTS (Plain Old Telephony Service) along with VoIP and broadband access to C-DOT's MAX / RAX subscribers.

C-DOT has also been active in the area of providing telecom software solutions. C-DOT's umbrella NMS (Network Management System) solutions have made it possible to manage heterogeneous networks with elements from multiple vendors. C-DOT is also entrusted with the projects of national importance, like Central Monitoring System for telecom security and Secure Network for strategic applications.

The state-of-the-art R&D facilities at C-DOT's Delhi and Bangalore campuses are comparable with the best in the world.

ACCOMPLISHMENTS AND ACTIVITIES DURING FY 2014-2015

FY 2014-2015 witnessed significant progress in the development of state-of-the-art cutting edge technologies, technology trials, efforts in technologies' commercialisation, which include signing of MoUs with manufacturers, technologies' promotions and demonstrations to prospective vendors, building requisite IPR assets, etc.

Some of the major technology projects, wherein significant progress has been made, are summarised below:

- **Communication and Security Research and Monitoring:** Centralised Monitoring System (CMS) infrastructure rollout, which include installation of Central Monitoring Centre (CMC) data centre at Delhi, Regional Monitoring Centre (RMC) data centre in 21 Licensed Service Areas (LSA), International Long Distance (ILD), Interception Store-and-Forward Server (ISF), etc, for lawful interception of voice and data by LEAs (Law Enforcement Agency).
- **Broadband Technologies:** Carrying out Software adaptations of multi-Terabit Router for IMS (IP Multimedia System) and LTE (Long Term Evolution).
- **Next Generation Mobile Technologies:** Development for LTE Femto eNodeB system and Fixed and Mobile Converged Platform (FMCP).
- **Carrier Networks Transport Technologies for Transport and Access Networks:** Technology development for the next generation PON system for applications requiring more bandwidth in the access and Dense wavelength division multiplexing based transport network system for long haul applications.
- **Telecom Services and Applications:** Software development for Unified Network Management System (UNMS) and Customised Platform for Rural Services (CPRS).
- **Secure Wireless and Wire Line Networks:** Design and development of Wireless Phone Secure (WiPS) tablet.
- **Next Generation Security for Telecom and Data Networks:** Development of an Advance Intelligent Monitoring System (AIMS) to scale up the architecture framework of the present CMS, development of interception solutions for new technologies like LTE/LTE-A, IMS-compliant FMCP, integration with other security agency solutions, like, content analysis, integration of satellite and marine interception and advance intelligence manager with AI (Artificial Intelligence) techniques.
- **Satellite-based Technologies:** Design and development of a satellite hub baseband system.
- **Enabling Technologies and Telecom Networks:** Feasibility studies and/or prototype developments on emerging telecom technologies.
- **Technology Field Implementation/Trials:** Field implementation of some of the technologies.

Through these indigenous developments and the support of indigenous manufacturers, C-DOT offers complete solutions required for urban, rural, north-east, and strategic sectors, such as, Defence and Security. Besides, C-DOT also provides life-time support to its technology in the TSPs' network with continuous technology upgradation, value addition, bug-fixing and providing alternate designs to address component obsolescence.

Achievements and progress made in the various schemes of technical projects are discussed in the following sections.

Communication and Security Research and Monitoring

The progress under this development scheme includes development, enhancements, Software customisations and progressive rollout of the technology in the field.

Technology rollout for CMS had commenced and progressively various activities were completed. Main CMC infrastructure installation was completed and it was powered up for upto 60% capacity, site preparation was done, Disaster Recovery functionality was lab-tested in minimum configuration, installation and integration of 3 ILDs were completed, installation and commissioning of ISF equipment at all TSP sites were completed for 21 LSAs and pilot RMCs are operational in 16 LSAs and TSPs were integrated and testing is going on. RMC IT infrastructure was received onsite for 14 LSAs and installation is in progress. Site preparation for CMC DR activities is going on.

Delhi and Karnataka LSAs with pilot RMC are ready for rollout of services.

Broadband Technology

Broadband technology development includes multi-Terabit Router (commercial-grade system) development.

Multi-Terabit Router (MTBR) design implementation is in progress with completion of SW adaptations for IMS, LTE, and about 60% completion of Router HW development. SW porting on the available hardware is progressively going on. Overall project is approximately 75% completed.

Next Generation Mobile Technology

Activities on next generation mobile technology comprise of development for LTE-A (Long Term Evolution-Advanced) – a 4G Mobile technology, and Fixed-and-Mobile Converged Platform (FMCP) for delivery of services to fixed and mobile subscribers.

FMCP technology development has been completed, leading to readiness of C-DOT IP Multimedia Subsystem (IMS) core, copper access node, integrated release of Fixed Line PrePaid (FLPP) and online recharge server with IMS core. Equipment for field trial of copper access node has been installed in MTNL network and AT (Acceptance Testing) process is going on. IMS core serves as the backbone for voice and video calls in LTE network deployment.

LTE-A technology development activities accomplished during the year include ToT (Transfer of Technology) process initiation for Femto LTE system in FDD band and completion of development of LTE Femto in TDD band. Besides, significant progress has been made in the development of various other nodes, namely, Radio Resource Management (RRM), Self Organising Network (SON), and Operation and Administration Module (OAM), and their lab testing is going on at present.

Carrier Networks Transport Technologies for Transport and Access Networks

Development for carrier networks transport technologies is planned to address the needs of the emerging applications that are data-centric, demanding high bandwidth and large data rate for flow of information, requiring transport/backhaul,

metro/aggregation, and access networks to evolve with upcoming technology trends. The ongoing development activities are as follows:

- Optical Aggregation and Access System (OAAS) – A next generation PON technology, namely, 32G PON system based on WDM. Development and lab validation for WDAN ONT and OLT has been completed – thus, 32G PON (WDAN) system is ready for field trial.
- Optical Core Network (OCN)- A 100G DWDM transport network system. Development has been completed for the terminal equipment with 100G Muxponder, and system integration and testing for partially equipped TEs (Terminal Equipment) with 100G Muxponder has been completed. Partially equipped TE for DWDM supporting 100G line rate is ready and development for TE with 40G Muxponder is in progress.

Telecom Services and Applications

Telecom services and applications activities aim to build SW platforms, applications to address changing technology trends towards convergence of applications, networks, contents and value-added services creating differentiation. At present, development for following SW platforms is going on.

- Unified NMS (UNMS) -A converged NMS platform, which facilitates the monitoring and management of service providers' networks and services. Generic UNMS platform development is in progress, for supporting a host of network management functionalities, and addressing requirements of different networks, namely, NFS, TSPs, ISPs, etc. Separate SW releases for PoC in the NFS network and pilot trials in other clients' networks – TSPs, ISPs, etc, have been made ready.
- Customized Platform for Rural Services (CPRS)– A SW platform for building rural applications with advance features, like, gesture and speech recognition, NFC (Near-Field Communication), etc. The features implemented so far include online Aadhaar based authentication, gesture recognition, video conferencing, etc. Pilot trial for the platform has also commenced.

Secure Wireless and Wireline Networks

Activities under this technology scheme aim at creating intra and inter department secure communication network within various ministries of the government. Under the scheme, project WiPS (Wireless Phone Secure) is ongoing, which involve development of core network elements, end user device(s) for setting up a secure mobile wireless network using standard wireless technologies, like, 3G, Wi-Fi.

The design for the end-user device – secure tablet (ver.2) - has been completed and packaging design is going on.

Satellite-based Technologies

Development of Gateway for terrestrial connectivity has been completed and delivered to the customer. Design, development and integration of hub baseband system have also been completed.

Next Generation Security for Telecom Data Networks

A project to develop an Advanced Interception and

Monitoring System (AIMS) is going on to address the enhanced security and interception requirements of LEAs.

The progress made under this project includes completion of development of interception for new technologies, namely, LTE, NGN LIS, and support IPLC (International Private Leased Circuit). Also, SW development for advanced Intelligence Manager (IM) has also been completed with release of standalone IM SW version, which provides functionalities like target SMS content analysis (support for English and Indian languages), community pattern identification in call data, entity-based tower intelligence SW for bulk data collection, etc.

New releases have also been made for the existing CMS solutions, which address bug-fixes and support features, like, ILD, LBS, multiple LIS provision, multilingual SMS, GPRS decoding, support for 3G video call (MONA codecs), etc.

Enhancements, New Features, Upgradation, Adaptations and Technical Support for developed technologies including the North-East Program

This scheme focuses on development efforts related to enhancements, evolution, feature addition, scalability, value addition and customisation for changing requirements. These are envisaged for the developed, deployed and to-be-deployed technologies of C-DOT.

For rollout of MAX-NG technology in the BSNL network, core network equipment has been supplied and installed at site and AT (Acceptance Testing) for its commissioning is going on. The technology manufacturer has been geared up for the manufacturing and supply of access equipment for migrating 1000 exchanges catering to complete north and east zone across 16 LSAs (Licensed Service Area). Similarly, in the MTNL network, IMS-compliant NGN (Next Generation Network) trial network has been set up. AT for IMS-compliant NGN core has been completed and is going on for access equipment – copper access node for migrating 1000 landline connections of legacy PSTN technologies to C-DOT's IMS-compliant NGN technology. Besides, IP-TAX functionality, solution for tele-caller and Centrex feature, has also been integrated with the NGN network and is in commercial operation. Traditional IN services in the MTNL network have also been migrated to NGN-IN platform and its AT has been completed.

Regular technical support is also being provided for field issues, manufacturing support for optical technology GPON in NOFN, deployment of BroadBand Wireless Terminals (BBWT), and NMS (Network Management System) in NOFN. Field support for commissioning Secure Dedicated Communication Network (SDCN) in the field is also being provided.

Enabling Technologies and Telecom Networks

Feasibility study/ PoC/ prototype development has been completed for the following new/ green-field areas in telecom enabling technologies and networks:

- Study of active antenna design for 4G Base Stations and mm waves for 5G Base Stations
- Prototype implementation for test automation framework
- Development of Green power supply system
- Study of M2M communication, etc.

BUSINESS PROMOTION

MAJOR ACCOMPLISHMENTS DURING 2014-15

During the year 2014-15 significant efforts were made for the promotion of C-DOT technologies. These included arranging Proof of Concept (PoC), trials, pilots, signing of agreements and submission of proposals, live demonstrations and showcasing of technologies at various exhibitions, seminars and in-house events. These efforts are summarized below:

- Agreement signed with Bharat Broadband Network Limited (BBNL) for providing Network Management Solution (NMS) for PAN India rollout of NOFN project.
- Agreement signed with BBNL for NoFN Geo-Intelligent solution for GPON planning.
- Fault localisation demonstrated in the fibre network for NOFN project,
- Supply order received for consultancy services to Indian Navy,
- C-DOT GPON technology field trials successfully completed for Indian Army at Military College of Telecommunication Engineering (MCTE), Mhow, Indore and for Indian Navy on board naval ship at Mumbai,
- PoC and demo of BBWT and Wi-Fi for public places/ municipalities at MTNL, Mumbai, of BBWT for CABS (Centre for Airborne System), DRDO, Bangalore, and demo and PoC of BBWT and GyanSetu at Sidhlaghattagrampanchayat block for BBNL completed,
- Bid submitted by BEL and ECIL for C-DOT Level2 switch in AFNET tender,
- LAN upgradation completed in TEC headquarters, DoT, using C-DOT Routers,
- DoT entrusted a project to C-DOT to examine data collection options from BTS for carbon foot print monitoring with a possibility to extend the work on pan-India basis, and PoC at one site has been demonstrated,
- C-DOT technology solutions, applications, techno-commercial proposals submitted to various Government agencies – for LEMF and integration with CMS to state police departments, like, Punjab Police, UP Police and Bhopal Police, Distress Caller Location Finding application to Delhi Police, CABSEC (Cabinet Secretariat) WAN expansion plan to BEL, IP Managed Leased Line Network (MLLN), BBWT, Wi-Fi for public places/ municipalities to MTNL Mumbai, SG-RAN to DoT GSM BSS security project and IISc, BBWT & GyanSetu in grampanchayats of NOFN project at Sidhlaghatta block, etc.
- Discussions are going on with DRDL (Defence Research and Development Laboratory), Hyderabad, for radio-on-the-move.

MARKETING EVENTS

C-DOT also participated in a number of conferences and exhibitions, namely, Israel Innovation Conference, MIXii 2014 (May 20th-22nd, 2014) at Tel Aviv, Israel, 5th Strategic Electronics Summit 2014 (SES 2014) – Defence and Aerospace (July 30th-31st, 2014) by ELCINA at Bangalore, DEFTRONICS-2014 (September 23rd-25th, 2014) at Bangalore, Defcom 2014 (November 17th-18th, 2014) at Manekshaw Centre, Delhi, Vibrant Gujarat Summit 2015 (January 7th-13th, 2015) at Gandhinagar, Gujarat, and Convergence India 2015 (January 21st-23rd, 2015) at Pragati Maidan, Delhi. State-of-the-art C-DOT technologies had been showcased in these exhibitions.

Inauguration of C-DOT Terabit Router & Fiber-to-the-Desk (FTTD) solution:

C-DOT has designed and developed India's first indigenous Terabit Router. Hon'ble Minister of Communications & IT, Shri Ravi Shankar Prasad inaugurated C-DOT Terabit Router along with GPON based Fiber-to-the-Desk solution (FTTD) during a TSDSI function held at C-DOT Campus, Delhi on 14th October, 2014.

C-DOT Terabit Router is the first indigenous Terabit Routing System, which can address the typical requirements of setting up a Next Generation Telecommunication Core Network for Data Centres & Service Providers. C-DOT switches and routing systems are built bottom up using indigenous resources software and hardware design.

Launch of C-DOT GyanSetu and MAX-NG technologies on Good Governance Day:

25th December 2014 was celebrated as 'Good Governance Day' by the Government of India. On the occasion, C-DOT dedicated its two citizen-friendly technologies to the Nation.

The launch of C-DOT's 'GyanSetu' & 'MAX-NG' technologies was done by Hon'ble Minister of Communications & Information Technology on Good Governance Day. These new developments from C-DOT would prove to be the stepping stones towards taking the benefits of Internet based services to the masses of country.

Transfer of Technology (ToT) of C-DOT 'GyanSetu' and 'MAX-NG' technology has been given to Electronics Corporation of India Limited (ECIL) for mass manufacturing and deployment of the equipment.

C-DOT exhibited its current set of products on Good Governance day at ManekshawCentre, Delhi. C-DOT Stall attracted more than 125 visitors from Government, Defence and private sector, who appreciated the real-time online demonstrations of its diverse technologies.

EXHIBITIONS & CONFERENCES

Participation in Convergence India 2015

Convergence India 2015, a 23rd edition of international exhibition & conference, themed as "Connecting India", was held at Pragati Maidan,

New Delhi during 21st - 23rd January 2015. C-DOT Stall in Convergence India 2015 received great response from business visitors as well as policy makers in telecom domain. In this event, Honorable Minister of State, Science and Technology & Earth Science appreciated C-DOT Technologies. Products displayed in the exhibition were Fibre-to the Desk, Divya Damini (WDAN), 100G Optical Link System, Tera-Bit Router, LTE-A, GyanSetu, Telecom Geo-Intelligence and NMS.

Participation in Israel Innovation Conference:

C-DOT participated in Israel Innovation Conference, MXIiii 2014 held in Tel Aviv, Israel during May 20th - 22nd, 2014. C-DOT showcased its GPON, and BBWT technologies at its stall along with the description of its other products. C-DOT's innovations were highly appreciated during the exhibition.

C-DOT Hosted IEEE International Conference on Advance Network and Telecommunication (ANTS)

ANTS is the premier IEEE forum on networking and telecommunications topics in India and the only conference financially sponsored by IEEE Communications Society. IEEE ANTS conference was inaugurated by on 15th December 2014 by Hon'ble Minister of Communication & IT Shri Ravi Shankar Prasad at C-DOT Campus, Delhi. The conference was organised during 14th-17th December 2015 also

witnessed the presentation of insightful research papers by C-DOT.

Participation in Defcom 2014

C-DOT participated in Defcom 2014 held at Manekshaw Centre during November 17th -18th, 2014. C-DOT demonstrated its Terabit Router, and GPON solution at its stall during the event. Several other C-DOT technologies suited to the specific needs of Defence establishments were also explained to the Defence officers during their visit to C-DOT stall.

Make in India- Telecom Conclave

On 12th February 2015, C-DOT organized a half day 'Make in India – Telecom' conclave at its campus in New Delhi. The event was inaugurated by Shri Rakesh Garg, Secretary Department of Telecommunications, Government of India. Telecom industry luminaries comprising of policy makers,

operators, manufacturers, academia, etc. participated in the conclave and shared their understanding of present telecom landscape, future telecom trends and approach for furthering telecom manufacturing in India. C-DOT presented its offerings for various consumer segments e.g. TSPs, ISPs, Building networks, Campus Networks, Public Wifi Hotspots, and Rural BPO etc. During the panel discussion, speakers stressed on the need to revive the telecom manufacturing in the country in line with the needs of operators and other users of telecom solutions. C-DOT discussed its future research roadmap with the industry and assured that it would continue to bring indigenous telecom products as per the requirements of the nation. As the forex outflow on the account of Electronic imports is increasing day by day, it has become imperative technologies and take them to manufacturers. This will not only save huge forex for the country, but would also develop a eco space of manufacturers, vendors, application developers in the country. Recent initiatives by the Government like Preferential Market Access have reinvigorated Indian telecom fraternity and it is expected that deliberations in 'Make in India – Telecom' conclave would pave the way for close co-operation among indigenous technology developers, manufacturers, academia, and policy makers of the country.

5th Strategic Electronics Summit 2014 (SES 2014) – Defence & Aerospace

C-DOT participated in the 5th Strategic Electronics Summit 2014 (SES 2014) – Defence & Aerospace,organised by ELCINA on 30th & 31st July, 2014 at Bangalore International Exhibition Centre (BIEC), Bengaluru.

Over 150 organisations participated as Exhibitors and / or Delegates. All the activities like Conference, Exhibition, Technical Sessions & Buyer-Seller meetings witnessed keen participation with over 300 delegates in the Conference and good footfalls of business visitors. The live demonstrations of C-DOT Broad Band Wireless Terminals (BBWT), Unified-NMS, LTE-A, Gigabit Passive Optical Network (GPON) were shown to the visitors. C-DOT's other products viz. Tera Bit Router, Shared GSM Radio Access Network, IP DSLAM and SDCN VoIP phone were also displayed with their vivid description.

Deftronics 2014

DEFTRONICS-2014 was held from 23rd-25th September 2014 in the Bangalore International Exhibition Centre, Bangalore, India. The high profile

event was organized by IESA and included events namely conference sessions, mini-exhibitions & one-to-one business meetings for the participants. Conference theme was "Impact India: Indian ESDM ecosystem in Defense, Internal Security & Aerospace - Challenges & Solutions"

C-DOT participated in this event during 23rd to 25th September 2014. A High Level Conference on key issues and business opportunities in Strategic Electronics was held. Shri Vipin Tyagi, Executive Director (EDR), C-DOT participated in the key panel discussion.

Vibrant Gujarat 2015:

7th Vibrant Gujarat Summit was held during 7th to 13th January 2015 at Mahatma Mandir, Gandhinagar, Gujarat, India. The seventh edition of the summit provided enormous prospects to the State to display its strengths, progressive stand, initiatives taken to improve governance, investor friendly climate and art & culture of Gujarat.

C-DOT displayed its products in BBNL stall at the event. Two teams from C-DOT, one from Delhi and one from Bangalore went to showcase the products of C-DOT.

Live demonstration of C-DOT products viz. BBWT, GyanSetu and GPON OLT was presented.

United Telecom Ltd. (C-DOT Licensed manufacturer) also displayed C-DOT GPON OLT in the event.

"Reach the unreached: ICT as the Facilitator", NGO meet at C-DOT Campus, Bangalore

C-DOT invited over 100 NGOs across South India working in ICT areas for the workshop on "Reach the unreached: ICT as a facilitator", to promote Gyansetu. Shri Vipin Tyagi, Executive Director, C-DOT gave the inaugural address and the event was also graced by our founder Executive Director, Sh. G. B Meemamsi. The NGOs expressed their keen interest in C-DOT's innovations and appreciated C-DOT's efforts with a constructive feedback.

TOT AGREEMENTS, MoUs, PROJECT AGREEMENTS

During this period, various agreements, namely, ToT agreements, MoUs, and project agreements were signed with prospective PSUs, and manufacturers for technology implementations, manufacturing, customised development. The details are as given below.

ToT agreements

Technology	No. of licences	Manufacturers	ToT Status
GPON	6	HFCL, UTL, VMC, ITI, BEL, RHPL	Progressively completed for various GPON variants
	6	L&T, Coral, ECIL, VMC, HFCL, BEL	Under advanced stage of discussion
MAX-NG	1	ECIL	Completed
	3	BEL, ITI, IL	Under advanced stage of discussion
BBWT	1	ECIL	Completed
	9	Coral, HFCL, VMC, BEL, ITI, Asmaitha, Digital Circuits, Innovation Communication	Under advanced stage of discussion
Terabit Router (TBR)	1	ECIL	Completed
	1	BEL	Completed
Layer2 switch	1	BEL	Completed
	1	ECIL	Under advanced stage of discussion
DRAX (GyanSetu)	1	ECIL	Completed
	3	HFCL, L&T, VMC	Under advanced stage of discussion

MoUs and project agreements

S.No.	Strategic partner	Purpose
1	Bharat Broadband Network Ltd (BBNL)	C-DOT's customised NMS for pan-India rollout of the NOFN
2		Implementation of telecommunication Geo-Intelligence solution for survey report analysis and GPON planning for NOFN.
3	Bharat Electronics Ltd (BEL)	Requirements of NFS tenders of BSNL for Indian Army and Navy
4	Electronics Corporation of India Ltd (ECIL)	Requirements of NFS tenders of BSNL for Army and Navy, and AFNET tender of Air Headquarters
5	Bharat Sanchar Nigam Ltd (BSNL)	Technical field support in BSNL network
6	Indian Navy	Consultancy services to the Indian Navy in designing the data network for their new generations of platforms.
46 Non-Disclosure Agreements (NDA) were also signed, covering exchange of confidential information related to joint development projects, outsourced components, transfer-of- technology and participation in tenders.		

IPR ASSET AND PUBLICATIONS

Details of patents filed

S.No.	Invention	Application No. / Date of Filing
1	Gesture based human machine interface using marker	2579/CHE/2014 / 24-05-2014
2.	A Communication System For Managing Leased Line Network And A Method Thereof - (International Application (US,UK,CHINA,CANADA)	14/354366 / 25-04-2014 1407310.0/ 25-04-2014 2012800643397/ 24-06-2014 2853017 / 22-04-2014
3	A Communication System For Managing Leased Line Network With Fallback-(International Application - (US,UK,CHINA,CANADA)	14/354338 / 25-04-2014 1407189.8 / 24-04-2014 201280053038 / 28-04-2014 2853417 / 24-04-2014

Details of patents obtained

S.No.	Invention	Application No. / Date of Filing	Patent No./ Date of Grant
1	ATM Architecture	176/DEL/2000 / 29-02-2000	260876 / 27-05-2014
2	Heatsink Adapter Removal Tool For Ball Grid Arrays	110/DEL/2005 / 17-01-2005	262829 / 17-09-2014
3	Interoperability of Set-Top-Box through smart card (US Patent)	13/141,036 / 13-04-2010	8978057 / 10-03-2015

Details of designs filed

S.No.	Invention	Application No. / Date of Filing
1	Chassis for holding network components	261413 / 01-04-2014
2.	Electronic equipment for USB charging and holding portable communication devices	264078 /17-07-2014

Details of designs obtained

S.No.	Invention	Application No. / Date of Filing	Patent No./ Date of Grant
1	Cable management enclosure for customer premises equipment	260302 / 12-02-2014	260302 / 13-08-2014
2	Tablet PC	260303 / 12-02-2014	260303 / 04-02-2015
3	Chassis for holding network components	261413 / 01-04-2014	261413 / 04-02-2015

Details of trademarks filed

S.No.	Invention	Application No. / Date of Filing
1	ChaturDamini	2926743 I 20-03-2015
2	MudrikaDamak	2926745 I 20-03-2015
3	LokDamak	2926746 I 20-03-2015
4	TitliDamak	2926747 I 20-03-2015
5	SamayDamak	2926748 I 20-03-2015
6	SamparkDamak	2926749 I 20-03-2015
7	Damini NET	2926750 I 20-03-2015
8	HERA	2926752 I 20-03-2015
9	Fiber Damak	2926753 I 20-03-2015
10	DivyaDamini	2926754 I 20-03-2015
11	Suteevra	2926755 I 20-03-2015

IPR asset statistics

IPR Assets	Category	Filed in FY 2014_15	Granted in FY 2014_15	Total Filed As on 31st March 2015	Waiting for grant as on 31st March	Total Granted
Patent	National	1	2	37	18	19
Patent	International	8	1	11	8	3
Design	National	2	3	13	1	12
Trademark	National	11	0	25	21	4
Copyright	National	0	0	8	0	8

Details of publications in 2014-15

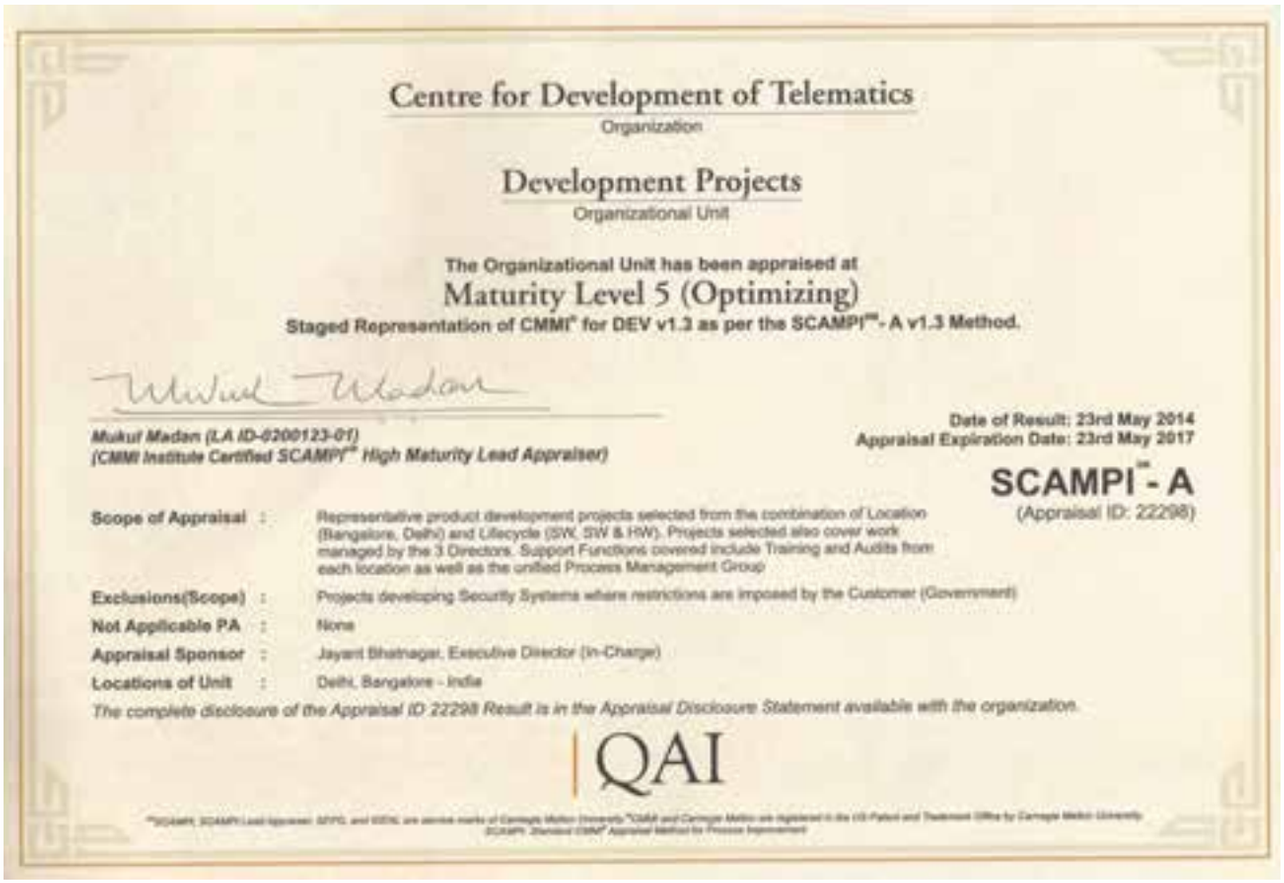
S. No.	Title	Publication Details	Publication Category	Relevant C-DOT products
1	Geo-Intelligence based Terrain-aware mobile Backhaul Planning for Rural India	Paper ID 1570023207, Conference-IEEE ANTS, Dec 14-17, 2014, New Delhi, India.	Conference	Geo-Intelligence
2	Geo-Intelligence based Carbon Footprint Monitoring and prediction of suitable Renewable Energy Technology system for Mobile Towers	Paper ID 1570022809, Conference-IEEE ANTS, Dec 14-17, 2014, New Delhi, India.	Conference	Geo-Intelligence
3	A comprehensive review of embedded system design aspects for rural application platform	International Journal of Computer Applications. Volume 106-November 11, 2014	Journal	GyanSetu
4	New Reservation Multiaccess Protocols for Underwater Wireless Ad Hoc Sensor Networks	IEEE Journal of Oceanic Engineering, Digital Object Identifier 10.1109/JOE.2014.2313996	Journal	General Technical
5	On the TDMA with Imprecise Propagation Delay Information	Conference, ANTS 2014	Conference	General Technical
6	New, Effective and Efficient Dimming and Modulation Technique for Visible Light Communication	IEEE 79th Vehicular Technology Conference (VTC Spring), Seoul, South Korea, 18–21 May 2014	Conference	General Technical
7	Cloud Computing & E-Health	TOLIC Tech. Articles Comp. 20.08.14	Magazine	General Technical
8	Solar Energy - A Thought-provoking Idea	TOLIC Tech. Articles Comp. 20.08.14	Magazine	General Technical

Awards in 2014-15

S.No.	Title	Description
1	ELCINA-EFY Awards	C-DOT was awarded with 'A Certificate of Merit' in the R & D Category from ELCINA (Electronic Industries Association of India) on design & development of 4- Port GPON OLT.

PROCESS IMPROVEMENT

After the study of high maturity (CMMI level 4 and 5) process areas, the design of the same started in Q1 of FY 2013-2014. Process definitions, process performance baselining and modeling, setting of organisation's quantitative business goals, their roll-out and implementation, subsequent re-baselining and re-modelling, periodic evaluation of organisation's business goals – all happened during the year, which ended with spot checks and pre-appraisal by external certified appraisers. In FY 2014-2015, in May, the entire organisation, comprising of the R&D setups at Delhi and Bangalore, successfully underwent SCAMPI-A appraisal for CMMI Maturity Level 5 in the very first attempt. The entire process – from process design to final appraisal – took 14 months, much less than the initial estimate of 21-24 months for an organisation of this size and diversity of activities. Since the appraisal, all the process practices of levels 2 to 5 are being maintained in all development projects, and periodic internal process audits are being carried out to ensure sustenance of the process maturity level.



Centre for Development of Telematics
Organization

Development Projects
Organizational Unit

The Organizational Unit has been appraised at
Maturity Level 5 (Optimizing)
Staged Representation of CMMI® for DEV v1.3 as per the SCAMPI℠- A v1.3 Method.

Mukul Madan (LA ID-0200123-01)
(CMMI Institute Certified SCAMPI℠ High Maturity Lead Appraiser)

Date of Result: 23rd May 2014
Appraisal Expiration Date: 23rd May 2017

SCAMPI℠- A
(Appraisal ID: 22298)

Scope of Appraisal	:	Representative product development projects selected from the combination of Location (Bangalore, Delhi) and Lifecycle (SW, SW & HW). Projects selected also cover work managed by the 3 Directors. Support Functions covered include Training and Audits from each location as well as the unified Process Management Group
Exclusions(Scope)	:	Projects developing Security Systems where restrictions are imposed by the Customer (Government)
Not Applicable PA	:	None
Appraisal Sponsor	:	Jayant Bhatnagar, Executive Director (In-Charge)
Locations of Unit	:	Delhi, Bangalore - India

The complete disclosure of the Appraisal ID 22298 Result is in the Appraisal Disclosure Statement available with the organization.

QAI

OTHER ACTIVITIES @ C-DOT

C-DOT CAMPUS

Infrastructure

Construction activity of Hostel and dwelling units at C-DOT campus is awaiting statutory approval.

C-DOT observes SWACHH BHARAT MISSION

All the staff members of C-DOT took part with great enthusiasm in the cleanliness drive carried out at C-DOT campuses in both Delhi and Bangalore, at the launch of "SWACHH BHARAT MISSION" by our Hon'ble PM on 2nd October 2014. Since then, regular inspection checks are carried out by the designated teams to review the state of cleanliness in the campus. Several in-house competitions viz. "The Cleanest Block", "The Cleanest Work Place" etc. are organised regularly to encourage the employees to contribute earnestly in this great mission.

HR INITIATIVES IN C-DOT

During the year 2014-15, C-DOT recruited 42 Fresh Engineers, from Computer Science and Electronics & Communication streams, through Campus recruitment at IITs, NITs and other reputed Engineering colleges. 4 Senior Research Engineers also joined C-DOT during this financial year.

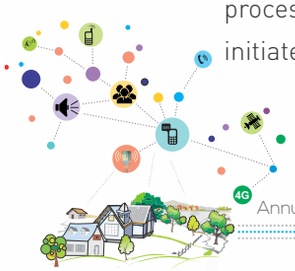
With the completion of the term of the Board members, the Board has also been re-constituted and the Executive Director and Director (Bangalore) were selected during this period. The recruitment process for the other Directors (two posts) was also initiated in 2014-15.

Women Empowerment

C-DOT's Management has always been sensitive to gender issues and has consistently worked towards creating organizational culture reflecting gender equality. Presently, about 31.8% of staff members in C-DOT are women.

Existing Policies:

- All eligible female staff members are allowed to avail up to 180 days maternity leaves and up to 90 days leaves subsequent to that (270 days inclusive of 180 days maternity leave). For miscarriage/abortion, leave of a total of 45 days in the entire service span is permissible.
- C-DOT has introduced the policy on child care leave. This leave has been granted to eligible female staff on their applying for the same.
- C-DOT offers accommodation and transport benefits to all its women employees with different options that maybe availed as per individual needs. This ensures the safety and security of all women employees in the company.
- Reimbursement for residential telephone expenses is admissible to about 100% of the women staff.
- Multifunctional allowance is admissible to 36% of the women employees.
- Career growth opportunities are available to women employees in C-DOT. In the last financial year, of the total employees promoted to higher grades 26% of them were women.
- In management cadres (Team Leaders, Group Leaders, Technical Experts and Sr. Technical Experts) about 17% are women.



- In order to address issues relating to Sexual Harassment of women staff at work place, a Committee has been constituted by C-DOT Board to take a fair and justified view of the cases and recommend suitable action on the same.

Employees' Welfare:

- For the purpose of coverage for hospitalization expenses, C-DOT has taken a Tailor-made group medi-claim insurance from National Insurance Company Ltd. Staff members (and their families) in executive cadres have coverage of Rs. 5 Lakhs with the facility of opting for Rs. 7.5 Lakhs and staff in non-executive cadres have been covered for Rs. 3.5 Lakhs with the facility of opting for Rs. 5. Lakhs. The Group Medi-claim policy has been made effective from 1st April, 2006.
- Grievance procedure has been introduced for C-DOT staff to provide the employees with easy & readily accessible machinery for prompt disposal of their day-to-day grievances.

Recruitment of SC/ST and persons with disabilities:

For recruitment of persons with disabilities and candidates belonging to SC/ST category, C-DOT follows government rules providing for reservation in jobs in C-DOT.

C-DOT has a system in place to look after the welfare of persons belonging to these categories and address any problems / complaints that may come up.

Benefits for persons with disabilities:

- C-DOT follows guidelines issued by Government of India with respect to reservations in jobs for persons with disabilities.
- The C-DOT Campus at Delhi has been constructed in such a manner so as to ensure barrier free environment for the persons with disabilities. The main entrance/exit can be approached through a ramp together with stepped entry. Even elevators connecting the various working areas have been installed in way to facilitate persons with disabilities to move around freely from one wing to another.

PROMOTION OF HINDI IN C-DOT

C-DOT is making serious efforts to ensure compliance to the Official Language Policy of Government of India. To create awareness among the employees, C-DOT organizes different programmes throughout the year. Many innovative programmes have been initiated at both Delhi and Bangalore centres of C-DOT in this regard. Hindi workshops are held regularly on topics of relevance.

The journalist, news anchor,reporter and political analyst Abhigyan Prakash was invited for "InseMiliye..." on 15th September, 2014. A rendezvous with the anchor of very popular news programmes "NEWSPOINT" and "MUQABLA" on a national TV Channel gave C-DOTians a chance to meet a person who has made his mark, in a highly competitive world of media, purely by his dedication, self-motivation and

goal oriented hard work. The programme was very inspiring and motivating.

Inspection for the progress of OL

A team of officers from the Department of Telecommunications inspected the implementation and progress of OL in C-DOT, Delhi on 15th October, 2014 and C-DOT, Bengaluru on 22nd December, 2014. They found everything up to the mark and satisfactory.

Kavi Sammelan

A grand Kavi Sammelan was organized on the occasion of C-DOT Foundation Day on 25th August, 2014. Noted Urdu poet and Sahitya Academy awardee Shri Munavvar Rana, the famous Hasya Kavi Shri Arun Gemini, the popular Hindi Ghazal writer and International Pushkin award winner Shri Alok Shrivastava, Shri Chirag Jain and Sushri Ritu mesmerized the audiences with their heart rending poems. Shri Munavvar Rana's enthralling presentation of his poems based on "mother" touched one and all.

Hindi Utsav

Hindi Utsav 2014 was celebrated at C-DOT, Delhi office from 15th to 30th September, 2014 while Bangalore office celebrated it from 11th to 26th November, 2014. Many competitions and events were organized during the fortnight to

motivate C-DOTians to do their day-to-day work in Hindi. An audio-visual Quiz was also organized in Hindi, which was liked by one and all. The highlight of the Utsav was a dramatic presentation of Gurudev Rabindranath Thakur's story "Samapti". The ace theatre personality Dr. Devendra Raj "Ankur" directed the play. It had been very successful in leaving a great impact on everyone and motivated people to once again connect to the literature and books.

OTHER CELEBRATIONS AT C-DOT

Women's Day:

C-DOT celebrated Women's day on 13th March 2015. Dr. Niloffer Shroff, Scientist G & Head of Division Photonics Development Division, Deity and Dr. Lavlin Thadani, an actor, producer and director graced this occasion and encouraged the women employees of C-DOT by talking about their lifetime achievements.

Statements of Accounts 2014-15

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Report of the Auditors on the Accounts of C-DOT for the Year ended 31st March, 2015 and Management's Replies thereto

To: The Members of
Centre for Development of Telematics (C-DOT)

Sl.No.	Auditor's Observations	Management's Replies thereon
1.	**Report on the Financial Statements** We have audited the accompanying financial statements of Centre for Development of Telematics (hereinafter referred to as 'C-DOT' or Centre), which comprise the Balance Sheet as at March 31, 2015, the Statement of Income and Expenditure account for the year then ended, annexed thereto, in which are incorporated the accounts of the units of the Centre audited by us and a summary of significant accounting policies and other explanatory information.	Factual position stated.
2.	**Management Responsibility for the Financial Statements** Management is responsible for the preparation of these financial statements that give a true and fair view of the financial position and the financial performance of the Centre in accordance with the Societies Registration Act, 1860 and Generally Accepted Accounting Principles in India. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.	Factual position stated.

Sl.No.	Auditor's Observations	Management's Replies thereon
3.	**Auditor's Responsibility**	
	Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Standards on Auditing issued by the Institute of Chartered Accountants of India. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.	Factual position stated
	An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Centre's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by the management, as well as evaluating the overall presentation of the financial statements.	
	We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.	

Sl.No.	Auditor's Observations	Management's Replies thereon
	Basis of Qualified Opinion	
	a. Investments and Loans	
	i. No provision has been made by the Centre for decline in value of investments of Rs. 52 Crores in the Equity Shares of the Joint Venture Company namely C-DOT Alcatel Lucent Research Centre Private Limited on account of total erosion of its net worth (Refer Note No. 3 of Part A – Schedule No. 15).	Management in consultation with the Government is engaged in deciding on future course of action regarding this Joint Venture. Appropriate accounting treatment for erosion in the net worth of the Joint Venture, loan and interest thereon will be made, once the plan in consultation with the Government is decided upon.
	ii. The Centre had advanced a sum of Rs. 18.46 Crores as loan to C-DOT Alcatel Lucent Research Centre Private Limited. As per the agreement, the Joint Venture Company has not only defaulted in the repayment of installments but also defaulted in repayment of interest. However, no provision has been made by the Centre even when the recoverability of the said amount is under doubt.	
	b. Claims Recoverable	
	Claims recoverable amounting to Rs. 1978.41 lakhs are due for long time. In spite of efforts made, no confirmation was made available from these parties. In the absence of the confirmations and consequent reconciliations, we are unable to comment on their recoverability and provision required against them, if any, and consequent effect thereof on the financial statements.	The amounts under Claims recoverable are considered good for recovery as they are mainly due from Government of India Telecom service provider.
	Qualified Opinion	
	In our opinion and to the best of our information and according to the	Factual position. Hence, no comments.

Sl.No.	Auditor's Observations	Management's Replies thereon
	explanations given to us, except for the effects of the matter described in the Basis of Qualified Opinion paragraph, the aforesaid financial statements give the information required by the Societies Registration Act, 1860 in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India: (a) in the case of the Balance Sheet, of the state of affairs of the Centre as at March 31, 2015 and (b) in the case of the Income & Expenditure account, of the deficit of the Centre for the year ended on that date.	

For M/s. Shiromany Tyagi & Co.
Chartered Accountants
(FRN006117N)

Sd/-
(CA. Sunil Kumar Rastogi)
Partner
M. No. 501378

Place: New Delhi
Date: 31.08.2015

For Centre for Development of Telematics

Sd/-
Vipin Tyagi
Executive Director

BALANCE SHEET AS AT 31ST MARCH...

(In Rupees)

	Schedule no.	2015	2014
CORPUS / CAPITAL FUND AND LIABILITIES			
Corpus/Capital Fund	1	2,829,022,080.29	3,245,032,891.67
Current Liabilities & Provisions	2	1,059,553,201.27	697,172,028.47
TOTAL		**3,888,575,281.56**	**3,942,204,920.14**
ASSETS			
Fixed Assets	3		
Gross Block		5,393,832,422.04	5,347,520,014.45
Less :- Depreciation		4,453,239,681.64	4,309,704,516.96
Net block		940,592,740.40	1,037,815,497.49
Assets in transit	3	5,923,404.00	0.00
Capital Work in Progress	4	4,656,512.00	4,459,882.00
Investments-Long Term	5	520,000,000.00	520,000,000.00
Current Assets, Loans & Advances and Deposits	6	2,417,402,625.16	2,379,929,540.65
TOTAL		**3,888,575,281.56**	**3,942,204,920.14**
Significant Accounting Policies	14		
Notes on Accounts	15		

Schedules 1 - 15 form an integral part of the Financial Statements

For and on behalf of the
Centre for Development of Telematics

Sd/-
G. Mukundan
Chief Finance Officer

Sd/-
Vipin Tyagi
Executive Director

In terms of our report of even date
For M/s. Shiromany Tyagi & Co
Chartered Accountants
Firm Regn. No. FRN006117N

Sd/-
CA. Sunil Kumar Rastogi
Partner
M.No. 501378

Place: New Delhi
Date: 31.08.2015

INCOME AND EXPENDITURE ACCOUNT

for the year ended 31st March...

(In Rupees)

	Schedule no.	2015	2014
INCOME			
TOT, Royalty, FSR and Publications	7	401,841,711.00	331,335,749.68
Interest Earned	8	65,890,407.69	58,354,330.52
Other Income	9	96,175,963.46	67,466,319.57
TOTAL(A)		**563,908,082.15**	**457,156,399.77**
EXPENDITURE			
Establishment Expenses	10	1,398,954,976.27	1,292,134,287.00
Operational Expenses	11	1,117,595,264.28	500,906,162.06
Other Administrative Expenses	12	241,019,826.75	322,232,207.18
Depreciation	3	227,043,766.94	293,682,259.26
TOTAL(B)		**2,984,613,834.24**	**2,408,954,915.50**
Excess of expenditure over income for the year C =(B-A)		2,420,705,752.09	1,951,798,515.73
Add/less(-):- Adjustments pertaining to earlier years	13	-4,694,940.71	-25,881,741.46
Balance being excess of expenditure over income		2,416,010,811.38	1,925,916,774.27
Add:- Excess expenditure over income of earlier years		16,959,920,270.45	15,034,003,496.18
Balance being deficit carried to Corpus Fund/Capital Fund		**19,375,931,081.83**	**16,959,920,270.45**
Significant Accounting Policies	14		
Notes on Accounts.	15		

Schedules 1-15 form an integral part of the Financial Statements

For and on behalf of the
Centre for Development of Telematics

Sd/-
G. Mukundan
Chief Finance Officer

Sd/-
Vipin Tyagi
Executive Director

In terms of our report of even date
For M/s. Shiromany Tyagi & Co
Chartered Accountants
Firm Regn. No. FRN006117N

Sd/-
CA. Sunil Kumar Rastogi
Partner
M.No. 501378

Place: New Delhi
Date: 31.08.2015

SCHEDULE 1

CORPUS / CAPITAL FUND

(Forming part of the Balance Sheet as at 31st March...)

(In Rupees)

	2015		2014	
Grants from Dept. of Electronics				
(Presently Dept of Information Technology)				
Accumulated balance	335,200,000.00		335,200,000.00	
Grants from Dept. of Telecommunication				
Balance at the beginning of the year	19,869,753,162.12		17,627,253,162.12	
Add:- Contributions towards Corpus/				
Capital Fund during the year	2,000,000,000.00	22,204,953,162.12	2,242,500,000.00	20,204,953,162.12
Less:- Balance of net expenditure transferred				
from the Income and Expenditure Account		19,375,931,081.83		16,959,920,270.45
TOTAL		**2,829,022,080.29**		**3,245,032,891.67**

SCHEDULE 2

CURRENT LIABILITIES & PROVISIONS

(Forming part of the Balance Sheet as at 31st March...)

(In Rupees)

	2015		2014	
CURRENT LIABILITIES				
1. Sundry Creditors				
a) For Goods	436,215,111.49		154,574,915.68	
b) Others	76,492,346.00	512,707,457.49	67,692,570.00	222,267,485.68
2. Advances received				
- For Funded Projects		81,069,309.60		40,879,631.60
3. Statutory Liabilities		26,694,674.00		28,857,157.00
4. Other Current Liabilities		105,069,976.18		116,635,287.19
Sub-total(A)		**725,541,417.27**		**408,639,561.47**
PROVISIONS				
1. Gratuity	4,206,952.00		0.00	
2. Leave Salary	329,804,832.00		288,532,467.00	
Sub-total(B)		**334,011,784.00**		**288,532,467.00**
TOTAL(A+B)		**1,059,553,201.27**		**697,172,028.47**

SCHEDULE 3

FIXED ASSETS

(Forming part of the Balance Sheet as at 31st March, 2015)

(In Rupees)

	Gross Block				Depreciation				Net Block	
	As on 01.04.2014	Additions	Adj./Write-off	As on 31.03.2015	As on 01.04.2014	For the year	Adj./Write-off	As on 31.03.2015	As on 31.03.2015	As on 31.03.2014
Land -Free Hold	120,000,000.00	0.00	0.00	120,000,000.00	0.00	0.00	0.00	0.00	120,000,000.00	120,000,000.00
Building-Office	570,180,967.65	0.00	0.00	570,180,967.65	347,988,041.07	22,219,292.66	0.00	370,207,333.73	199,973,633.92	222,192,926.58
Building-Residential	23,627,434.00	0.00	0.00	23,627,434.00	14,139,168.62	474,413.28	0.00	14,613,581.90	9,013,852.10	9,488,265.38
R & D Equipment	1,866,885,950.94	40,905,063.16	(70,133,604.01)	1,837,657,410.09	1,482,581,661.22	63,227,668.33	(66,442,040.01)	1,479,367,289.54	358,290,120.55	384,304,289.72
R & D Computers	2,062,314,831.15	76,371,963.44	(14,289,048.00)	2,124,397,746.59	1,946,036,029.13	115,945,932.58	(14,869,982.50)	2,047,111,979.21	77,285,767.38	116,278,802.02
Office Equipments & Appliances	349,659,126.17	4,255,551.00	(771,435.00)	353,143,242.17	273,426,804.72	12,571,348.72	(783,648.38)	285,214,505.06	67,928,737.11	76,232,321.45
Furniture & Fixtures	297,595,485.23	11,578,761.00	(1,667,839.00)	307,506,407.23	188,276,592.89	12,541,126.37	(1,411,941.37)	199,405,777.89	108,100,629.34	109,318,892.34
Library Books	57,256,219.31	63,985.00	(990.00)	57,319,214.31	57,256,219.31	63,985.00	(990.00)	57,319,214.31	0.00	0.00
Total	**5,347,520,014.45**	**133,175,323.60**	**(86,862,916.01)**	**5,393,832,422.04**	**4,309,704,516.96**	**227,043,766.94**	**(83,508,602.26)**	**4,453,239,681.64**	**940,592,740.40**	**1,037,815,497.49**
Assets in transit									**5,923,404.00**	**0.00**
Previous year's total	**5,090,481,473.63**	**350,238,744.17**	**(93,200,203.35)**	**5,347,520,014.45**	**4,100,616,755.11**	**293,682,259.26**	**(84,594,497.41)**	**4,309,704,516.96**	**1,037,815,497.49**	**989,864,718.52**

SCHEDULE 4

CAPITAL WORK IN PROGRESS

(Forming part of the Balance Sheet as at 31st March, 2015)

(In Rupees)

	As at 01.04.2014	Additions	Transfer to Fixed Assets	As at 31.03.2015
Campus -Delhi				
1) Campus-Residential Complex	4,459,882.00	196,630.00	0.00	4,656,512.00
Total	**4,459,882.00**	**196,630.00**	**0.00**	**4,656,512.00**
Previous Year Balance	4,459,882.00	0.00	0.00	4,459,882.00

SCHEDULE 5

INVESTMENTS - LONG TERM

(Forming part of the Balance Sheet as at 31st March...)

(In Rupees)

	NO. OF FULLY PAID EQUITY SHARES	FACE VALUE PER SHARE (Rs.)	2015	2014
UNQUOTED (At cost)				
JOINT VENTURE COMPANY				
C-DOT ALCATEL-LUCENT RESEARCH CENTRE PVT. LTD. (CARC)	52,000,000	10	520,000,000.00	520,000,000.00
TOTAL			**520,000,000.00**	**520,000,000.00**

SCHEDULE 6

CURRENT ASSETS, LOANS & ADVANCES AND DEPOSITS

(Forming part of the Balance Sheet as at 31st March...)

(In Rupees)

	2015		2014	
A. CURRENT ASSETS				
1 Inventories (As taken, valued and certified by the Management)				
a) Inventory	484,544,876.80		347,557,075.56	
b) Inventory in transit	3,350,938.39	487,895,815.19	45,489,419.93	393,046,495.49
2 Sundry Debtors				
a) Debts outstanding for a period exceeding six months	433,009,940.94		433,647,969.48	
b) Others	233,589,936.83		256,997,928.16	
	666,599,877.77		690,645,897.64	
Less:-Provision for Bad &Doubtful Sundry Debtors	68,990,982.00	597,608,895.77	68,990,982.00	621,654,915.64
3 Bank Balances				
a) With Scheduled banks				
On Deposit Accounts	355,169,281.38		327,285,906.00	
On Saving Accounts	186,160,298.45	541,329,579.83	71,235,753.69	398,521,659.69
TOTAL (A)		**1,626,834,290.79**		**1,413,223,070.82**
B. LOANS & ADVANCES				
1 Loans				
a) Staff	10,412,582.00		8,052,038.00	
b) CARC Pvt Ltd	184,578,500.00	194,991,082.00	184,578,500.00	192,630,538.00
2 Advances and other amounts recoverable in Cash or in kind or for value to be received.				
a) Contractors & Suppliers	172,876,283.66		254,932,033.58	
b) Employees	3,108,140.00		3,676,700.00	
c) Prepaid expenses	10,101,563.12	186,085,986.78	12,464,611.00	271,073,344.58
3 Interest Accrued				
a) On Staff Loan	1,305,369.21		908,394.28	
b) On Bank Deposits	3,435,102.65		3,568,691.90	
c) CARC Loan	59,858,060.00	64,598,531.86	59,858,060.00	64,335,146.18
4 Claims Recoverable		199,160,137.35		197,925,312.35
5 Tax Deducted at Source		128,799,811.44		148,617,329.44
6 Disputed Income tax		11,031,283.31		81,031,283.31
7 Centvat credit receivable		2,496,331.63		4,357,100.97
TOTAL (B)		**787,163,164.37**		**959,970,054.83**
C. DEPOSITS				
a) Office Building	40,500.00		40,500.00	
b) Others	3,364,670.00		6,695,915.00	
TOTAL (C)		**3,405,170.00**		**6,736,415.00**
TOTAL (A)+(B)+(C)		**2,417,402,625.16**		**2,379,929,540.65**

SCHEDULE 7

INCOME FROM TOT, ROYALTY, FSR AND PUBLICATIONS

(Forming part of Income & Expenditure Account for the year ended 31st March...)

(In Rupees)

	2015	2014
1) Income from Transfer of Technology (TOT)	6,950,000.00	800,000.00
2) Field/Technology Support Receipts	394,804,211.00	330,260,136.93
3) Income from Publications	87,500.00	275,612.75
TOTAL	**401,841,711.00**	**331,335,749.68**

SCHEDULE 8

INTEREST EARNED

(Forming part of Income & Expenditure Account for the year ended 31st March...)

(In Rupees)

	2015	2014
1) On Term deposits with Scheduled Banks	30,719,953.79	27,384,688.24
2) On Saving Account with Scheduled Banks	3,737,158.10	3,569,213.06
3) On Loans to Employees/Staff	1,163,236.80	758,930.22
4) On loans to Others	2,214,939.00	22,149,422.00
5) Others	28,055,120.00	4,492,077.00
TOTAL	**65,890,407.69**	**58,354,330.52**

SCHEDULE 9

OTHER INCOME

(Forming part of Income & Expenditure Account for the year ended 31st March...)

(In Rupees)

	2015	2014
1) Profit on Sale/disposal of Assets	990.00	1,720,011.31
2) Miscellaneous Income	61,923,752.78	30,243,523.72
3) Gain due to foreign exchange translation	903,973.68	1,263,573.54
4) Income from rent	33,347,247.00	34,239,211.00
TOTAL	**96,175,963.46**	**67,466,319.57**

SCHEDULE 10

ESTABLISHMENT EXPENSES

(Forming part of Income & Expenditure Account for the year ended 31st March...)

(In Rupees)

	2015	2014
a) Salaries and Wages	1,004,087,365.00	894,163,643.00
b) Bonus	804,782.00	825,506.00
c) Contributions to Provident Fund	88,581,294.00	84,104,653.00
d) Contributions to other Funds	11,602,395.00	6,313,842.00
e) Gratuity provided for employees	42,206,952.00	77,014,042.00
f) Staff Welfare expenses	229,334,856.27	196,996,672.00
g) Rent on residentials and Maintenance Expenses	17,799,105.00	17,204,825.00
h) Recruitment and Training Expenses	4,538,227.00	15,511,104.00
TOTAL	**1,398,954,976.27**	**1,292,134,287.00**

SCHEDULE 11

OPERATIONAL EXPENSES

(Forming part of Income & Expenditure Account for the year ended 31st March...)

(In Rupees)

	2015	2014
a) R &D Components & Consumables	188,141,333.79	251,334,204.50
b) Freight & Forwarding Charges	13,008,906.00	11,545,546.04
c) Repair &Maintenance-R&D & Office Equipments	40,817,220.49	51,483,977.52
d) Design, Development & Technology support Expenses	829,597,905.00	146,989,391.00
e) Consultancy, Apprentice training & Technical services Expenses	44,937,800.00	38,977,913.00
f) Testing Charges	1,092,099.00	575,130.00
TOTAL	**1,117,595,264.28**	**500,906,162.06**

SCHEDULE 12

OTHER ADMINISTRATIVE EXPENSES

(Forming part of Income & Expenditure Account for the year ended 31st March...)

(In Rupees)

	2015		2014	
a) Travelling and Conveyance expenses		24,422,927.35		28,660,329.25
b) Vehicle hire charges		3,086,877.00		3,509,079.00
c) Rent, Rates & Taxes		2,811,460.00		52,696,073.50
d) Interest Paid		11,169.00		22,217,671.00
e) Electricity & Water Charges		92,089,651.47		82,870,711.08
f) Repairs & Maintenance-Others		66,052,371.97		65,589,584.00
g) Newspaper , Periodicals, Journals & CDs		7,234,744.14		8,638,619.00
h) Insurance Charges		643,617.00		749,539.00
i) Printing, Stationery, Photocopy & Admin Consumables		7,978,505.41		8,747,397.74
j) Postage, Telephone and Communication Charges.		13,634,039.23		15,678,152.99
k) Exhibition, Advertisement & Publicity Expenses		8,134,645.00		13,321,248.00
l) Expenses on Conference/Seminar/Membership Fees		1,794,764.00		4,567,166.45
m) Legal, Professional fees & Honorarium		4,152,459.00		3,760,413.54
n) Patent fees		3,318,478.00		1,130,768.00
o) Remuneration to Auditors				
Audit Fees	300,000.00		300,000.00	
Out of pocket expenses	94,694.00	394,694.00	254,701.00	554,701.00
p) Hospitality/Entertainment Expenses		76,646.00		73,429.00
q) Bank Charges		964,238.37		1,251,868.46
r) Loss due to foreign exchange translation		1,316,709.51		5,816,301.32
s) Miscellaneous Expenses		260,601.65		206,730.31
t) Loss on sale of Assets		2,641,228.65		2,192,424.54
TOTAL		**241,019,826.75**		**322,232,207.18**

SCHEDULE 13

ADJUSTMENTS PERTAINING TO EARLIER YEARS (NET)

(Forming part of Income & Expenditure Account for the year ended 31st March...)

(In Rupees)

	2015		2014	
	Debit	Credit	Debit	Credit
INCOME				
TOT, Royalty, FSR and Publications	0.00	10,479,980.00	0.00	30,010,417.67
Interest Earned	0.00	0.00	0.00	0.00
Other Income	0.00	211,003.00	0.00	0.00
EXPENDITURE				
Establishment Expenses	338,193.00	0.00	1,928,466.00	0.00
Operational Expenses	0.00	4,959,830.10	2,158,374.50	0.00
Other Administrative Expenses	9,335,610.00	0.00	5,818,934.00	0.00
Depreciation	1,282,069.39	0.00	0.00	5,777,098.29
TOTAL	**10,955,872.39**	**15,650,813.10**	**9,905,774.50**	**35,787,515.96**
Net Debit/Credit		**4,694,940.71**		**25,881,741.46**

Schedule 14

SIGNIFICANT ACCOUNTING POLICIES

(Forming part of the accounts for the year ended 31st March, 2015)

1. Accounting Method

a) The financial statements are prepared on accrual basis of accounting under historical cost convention in accordance with generally accepted accounting principles and standards in India and provisions of the Societies Registration Act, 1860.

2. Use of estimates

a) Preparation of financial statements require estimates and assumptions to be made that effect the reported amount of assets and liabilities on the date of financial statement and the reported amount of revenues and expenses during the reporting period. Differences between actual results and estimates are recognized in the period in which the results are known/materialized.

3. Fixed Assets

a) Fixed Assets are stated at cost less accumulated depreciation and any impairment in value. Cost of fixed assets comprises the purchase price and any directly attributable cost of bringing the asset to its working condition for its intended use.

b) Asset, the individual cost of each of which is Rs. 5,000 or less is also capitalized and depreciated in the year of acquisition itself at 100% value reduced by one rupee.

c) Library books are capitalized irrespective of the individual values thereof.

d) Subsequent expenditure related to an item of fixed asset is added to its book value only if it increases the future benefits from the existing asset beyond its previously assessed standard of performance.

e) The Management conducts physical verification of fixed assets and their reconciliation with financial records. Such exercise is undertaken, taking into account the nature /size of activities of the Centre.

4. Depreciation

a) The provisions of Appendix I to the Income Tax Rules, 1962 (The Rules), as amended from time to time, are applied with the exceptions indicated below

i. Assets put to use anytime during the year are depreciated at the full rate prescribed by the Rules.

ii. Library books purchased during the year are depreciated fully in the same year.

iii. Assets, which are sold or discarded or lost or disposed off during the year, do not suffer depreciation for that year.

5. Inventory Valuation

a) Stores and Spares (including machinery spares) are valued at cost. The cost is calculated on weighted average method. Cost comprises expenditure incurred in the normal course of business in bringing such inventories to its location and includes, where applicable, appropriate overheads.

b) Obsolete, slow moving and defective inventories are identified at the time of physical verification of inventories and, where necessary, provision is made for such inventories.

6. Investments

a) Current investments are valued at lower of cost & fair market value.

b) Long Term Investments, including in Joint Ventures, are carried at cost. Where necessary, provision is made to recognize decline, other than temporary, in valuation of Long Term Investments.

7. Accounting for Grants-In-Aid

a) Grants-in-aid received from the Government are treated as towards "Corpus / Capital Funds".

b) The Grants-in-aid are treated as accrued when sanction memos are issued by the Administrative Ministry.

8. Revenue Recognition

a) In respect of projects undertaken by the Centre for Telecom Operators and other agencies, the expenses and income in relation to these, are accounted for as expenditure / income respectively, only upon completion of the milestones related to project. Where the milestones/acceptances are not completed, the balances available in the Project account are shown as advances/ recoverable on the balance sheet date.

b) Revenue is recognized to the extent that it is possible to estimate/ascertain that the economic benefits will accrue to the Centre and the revenue can be realistically measured. When the Centre is unable to assess the ultimate collection with reasonable certainty, revenue recognition is postponed and is recognized as revenue when the collection is reasonably certain.

9. Foreign Currency Transaction

a) Foreign currency transactions are accounted at the exchange rate prevailing on the date of transaction and the difference between the date of transaction and payment / receipt /accrual are accounted for as income or expenditure, as the case may be.

b) Monetary Current Assets and current liabilities denominated in foreign currency are translated at the exchange rate prevailing as at the year end and the resultant gain / loss is adjusted to revenue account. Advances paid to foreign suppliers for materials/services are treated as non-monetary assets and consequently are reported using the exchange rate at the date of transaction.

c) Contingent liabilities denominated in foreign currency are translated at the exchange rate prevailing as at the year end.

10. Retirement and other employee benefits

a) The Centre operates defined benefit plan for Gratuity to its employees. The costs of providing benefits under this plan are measured on the basis of actuarial valuation at the end of each year using projected unit credit method. Actuarial gains or losses for the defined benefit plan are recognized in full in the period in which they occur in the statement of profit or loss.

b) Provisions for compensated absences are accounted for based on actuarial valuation using the projected unit credit method at the year end.

11. Adjustments pertaining to earlier years

a) Adjustments necessitated during the current year due to errors/omissions pertaining to one or more previous years are treated as prior period items only when the value in each such case exceeds Rs. 5000/.

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12. Provisions and Contingent Liabilities

a) The Centre creates provision when there is a present obligation as a result of an obligating event that probably requires an outflow of resources and a reliable estimate can be made of the amount of outflow.

b) A disclosure for a contingent liability is made when there is a possible obligation or a present obligation that may, but probably will not, require an outflow of resources. Where there is a possible obligation or a present obligation in respect of which the likelihood of outflow of resources is remote, no provision or disclosure is made.

Schedule 15

Notes on Accounts

(Forming part of the Accounts for the year ended 31st March, 2015)

PART - A : Balance Sheet

1.0 Fixed Assets

a. Fixed assets include land at New Delhi measuring 40 acres (Previous Year- 40 acres) was acquired in 1993 from Government of India . This land has been considered free hold, even though no formal conveyancing has been done in favour of the CENTRE.

2.0 Capital Work-in –Progress

a. This represents the cumulative expenditure, incurred since 2008-09, on the proposed Housing facility at the Campus at New Delhi, amounting to Rs. 46.57 lakhs as at 31.03.2015. (Previous Year - Rs. 44.60 lakhs)

b. The expenditure under this head will be capitalized appropriately under "Fixed Assets", upon completion of the Housing Facility.

3.0 Investments

a. The aggregate of the investments in the equity of a Joint Venture Company engaged in Research & Development in the field of Telecommunications was Rs. 5200.00 lakhs. (Previous Year - Rs. 5200.00 lakhs). As one of the promoters of the Company, C-DOT is awaiting the directive of the Government on reviving that Company. Hence, no provision has been made in these accounts in respect of the erosion of the net worth of that company as at 31.03.2015.

4.0 Current Assets, Loans, Advances and Deposits

a. Inventory of Components includes :-

i. An amount of Rs. 134.11 lakhs as at 31.03.2015,(Previous year Rs. 134.11 lakhs) being components which remained unmoved for more than three years on the balance sheet date . The Management is of the view that these components may still be used in the current and future R&D programmes of the Centre.

ii. The value of Components, which were purchased in the past years, issued to the indentors, treated as consumed in the accounts of the year of issue, but part of which were returned to the stores during the current year by the indenting groups unconsumed – Rs. 99.27 Lakhs as at 31.03.2015 (Previous Year - Rs. 18.82 lakhs).

b. Sundry Debtors amounting to Rs. 6666.00 Lakhs as at 31.03.2015 (Previous Year Rs. 6906.46 lakhs) includes :-

i. On account of TOT & Royalty dues of Rs. 2331.43 lakhs as at 31.03.2015 (Previous Year - Rs. 2331.43 lakhs) due from the concerned licensee has been fully met by the value of the land and buildings at Bangalore belonging to that licensee taken over / occupied by the Centre since 2005. .

ii. On account of Royalty dues of one of the licensees, the same are being received in installments. The balance as at 31.03.2015 was Rs. 268.90 lakhs (Previous Year - Rs. 398.90 lakhs).

iii. On account of TOT /Royalty dues from other licensees, the balance as at 31.03.2015 was Rs. 121.39 lakhs (Previous year- Rs. 102.36 lakhs).

iv. The balance amount of TOT/Royalty dues of Rs. 689.91 lakhs as at 31.03.2015 (Previous Year Rs. 689.91 lakhs), provision for bad and doubtful debts has been made in these Accounts.

v. On account of dues for other services rendered to Telecom companies Rs. 3217.51 lakhs as at 31.03.2015. (Previous Year - Rs. 3042.91 lakhs).

vi. On account of rent receivables from Telecom Companies /Research Academy- Rs. 36.86 lakhs (Previous Year Rs. 340.95 lakhs)

c. Claims Recoverable :-

i. The aggregate of the amount realizable by the Centre as at 31.03.2015, on account of projects undertaken by it for the other organizations/expenses incurred by it, on reimbursement of cost basis,

was Rs. 1991.60 lakhs (Previous Year - Rs. 1979.25 lakhs). All these amounts, which are included under "Claims Recoverable", are considered good for recovery. Hence, no provision has been made in respect thereof, while making these accounts.

5.0 Contingent Liability not provided for :-

a. On account of unexpired letters of credit issued by bankers in respect of purchase orders for procurement of components and equipment – Rs. Nil lakhs as at 31.03.2015 (Previous Year - Rs. Nil lakhs)

b. On account of bank guarantees given by / on behalf of the Centre of Rs. 8.80 lakhs as at 31.03.2015 (Previous Year - Rs. 8.80 lakhs).

c. On account of pending legal cases, the amount outstanding is Rs. 20.87 lakhs. (Previous year Rs. 20.87 lakhs).

PART - B: Income & Expenditure Account

1.0 Expenditure :-

A. Employees' Benefits :-

i. Gratuity

The value of liability of the Centre on account of Gratuity in respect of all employees on rolls at the end of the year on actuarial valuation basis was Rs. 4000.18 Lakhs (Previous year Rs. 3364.34 lakhs). The net expenditure recognized in the Income & Expenditure account for Gratuity in the current year was Rs. 422.07 lakhs (Previous Year Rs. 770.14 lakhs).The Gratuity Trust, which is managed by a separate Board of Trustees comprising of employees, is discharging the liability on this account.

ii. Earned Leave (EL)

As per Rules of the Centre, Earned Leave is encashable by serving employees as well as by those leaving the services, either on superannuation or otherwise. The provision for liability, estimated

on actuarial valuation basis, in respect of Earned Leave of employees as at 31.03.2015, was Rs. 3298.05 lakhs (Previous Year Rs. 2885.32 lakhs).

B. Bonus

Ex-gratia payment to eligible employees of the Centre, as per applicable policy from time to time is treated as expenditure of the year on an estimate basis. The estimated expenditure provided on account of bonus for the year is Rs. 8.05 lakhs (Previous Year Rs. 8.26 lakhs).

C. Consumption of Components :-

i. As per the practice followed consistently, the value of consumption is arrived at by reducing the value of closing stock from the aggregate of the values of opening stock and the purchases made during the year.

ii. Accordingly, the value of components consumed during the year was Rs. 1881.41 Lakhs (Previous year Rs. 2513.34 Lakhs).

D. Foreign Exchange Fluctuations :-

i. The net result of the fluctuations in Foreign Exchange on account of the transactions during the year was a loss of Rs. 4.13 Lakhs (Previous Year- loss of Rs. 45.53 Lakhs).

ii. The gains and losses on account of such fluctuations are distinctly disclosed in Schedule 9 and 12 respectively.

E. Adjustments Pertaining to earlier years (Net) :-

Income and Expenditure under this head (refer Schedule 13), includes income of Rs. 106.91 lakhs (Previous year Rs. 300.10 lakhs) and expenditure of Rs. 59.96 lakhs (Previous year Rs. 41.29 lakhs)

PART – C : General

Previous year's figures have been regrouped or rearranged, wherever necessary.

Sd/-
G. Mukundan
Chief Finance Officer

Sd/-
CA. Sunil Kumar Rastogi
Partner
M/s. Shiromany Tyagi & Co
Chartered Accountants
M.No. 501378
FRN006117N

Sd/-
Vipin Tyagi
Executive Director

Our Bankers

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New Delhi-110 030

Syndicate Bank
Corporate Finance Branch
6, Sarojini House, Bhagwan Dass Road,
New Delhi-110 001

Canara Bank
Electronic City-I, Hosur Road,
Bengaluru-560 100

Central Bank of India
Sona Towers, 71/1, Millers Road,
Bengaluru-560 100

Our Statutory Auditors

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Chartered Accountants
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Our Offices

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