

Interaction meeting of the Officer Trainees (probationers) of 2013 Batch of Indian Telecom Service (ITS) / P&T Building Works Service (BWS) with the Hon'ble PRESIDENT OF INDIA

A group of Probationers of Indian Postal Service, Indian Telecom Service and P&T Building Works Service called on the Hon'ble President of India, Shri Pranab Mukherjee on 09 March 2016 at Rashtrapati Bhavan.

Speaking on the occasion, the President said that the part privatization of Postal and Telecom sector in the era of liberalization has witnessed drastic changes in technology and exponential growth of the consumers. If we have to survive in the competitive world, we have to keep pace with the fast changing Information and Communication Technology.



ITS / BWS -2013 batch Officer Trainees with Honourable President

He said that India has undergone a telecom revolution during the last two decades. The launch of mobile telephony and faster Internet in India has enabled it to tap its vast digital potential. India is emerging as a fast digital hub. It is the need of the hour to have best quality telecom and Internet services. The numbers are likely to increase exponentially with enhanced levels of education and cheaper rate of Internet and mobile telephony. He expressed hope that the Postal Academy and National Telecommunications Institute are providing requisite technical and non-technical inputs to enable the probationers to take up the ensuing challenges in the postal, telecom and building works sector. They (probationers) have to work with professionalism, transparency and integrity to meet the aspirations of large number of people of India.



Honourable President addressing the officer trainees

The probationers of the Indian Postal Service are presently undergoing professional training at the Rafi Ahmed Kidwai National Academy, Ghaziabad while probationers of Indian Telecom Service and P&T Building Work Service are undergoing their induction training at National Tele-communications Institute for Policy Research, Innovation & Training, Ghaziabad. The Experience Sharing address was delivered by ITS Officer Trainee Ms. Khushboo Sharma. Presentation of Memento to the Honourable President of India was made by Shri Debi Prasad De, Sr. DDG (TEC/ NTIPRIT).

Interaction of ITS/BWS Officer Trainees (probationers) 2014 Batch with the Hon'ble MOC&IT

An interaction of Officer Trainees of Indian Telecommunications Service and P & T Building Works Service of 2014 batch with Honourable Minister of Communications & Information Technology Shri Ravi Shankar Prasad was held on January 16, 2016 at Sanchar Bhavan, Department of Telecommunications, New Delhi.

Secretary Telecom Shri Rakesh Garg, Member (Services) Shri N. K. Yadav and other senior officers of DoT and National Telecommunications Institute for Policy Research, Innovation & Training (NTIPRIT) were present in the interaction meeting.

During the meeting, the seventeen ITS officer trainees and one P&T BWS officer trainees introduced themselves to Hon'ble MoC&IT. Most of the officer trainees have completed their B.Tech degree from prestigious engineering colleges such as IITs and NITs.

Secretary Telecom, in his address stated that the officer trainees are very talented and directed them to do the hard work and stay honest.



ITS / BWS -2014 batch Officer Trainees with Hon'ble MOC&IT

Hon'ble MOC&IT welcomed the officer trainees to the Department of Telecommunications, Government of India and apprised them the highlights of the steps the Department is taking towards Digital India and Digital Inclusion.

Hon'ble Minister stated that the technology is changing very fast in the field of telecom sector. The Internet is also growing very fast in India and in fact globally we are second in Internet penetration after China. Mobile penetration is also increasing and showing a robust growth in India. Our country

is moving towards digitization through the establishment of optical fibre network called 'BharatNet'. The BharatNet network shall help India to move towards Digital India and ultimately leading to adoption of Good governance practices.

Hon'ble Minister stressed that India is a happening place in the field of Information and Communication Technology where we can have enormous development provided we have the research abilities, innovation and newer ideas. He further informed that rigorous exercise has been undertaken in BSNL in assigning and achieving the targets and now the operating profits of the BSNL is improving and the customer base is also enhancing.

Similarly, the Department of Post has also been striving to boost the revenue through new and innovative services such as e-commerce.

He asked the officer trainees to think and plan about the roadmap for changing face of India – adopting and enlightening with new technologies. Hon'ble MOC&IT asked the officer trainees to become active catalytic changers for the development of India. The telecom service is a developmental service where innovation is the key to success. He ignited the young minds of officer trainees to come out with new ideas in the telecom sector.

Hon'ble Minister stated that with the Digital Infrastructure being created by BharatNet, we will be able to spread the BPO schemes in smaller cities and towns thus creating job opportunities there itself. There is a plan to establish call centres in smaller towns and cities and even in rural areas. This will in turn result into digital inclusion for all.

Common Service Centres (CSCs) have been created in many villages to provide good governance services to rural folks. Hon'ble MOC&IT emphasised officer trainees to become good officer and maintain highest level of Integrity.

Approvals from Jan 2016 to Mar 2016

S. No.	Name of the Company /Name of Product & Modal No.
1	M/s Atrie Technology Pvt Ltd.
1.1	High Speed Line driver, Wirespan 3000
2	M/s Fibcom India Ltd
2.1	FIBCOM 6335 Switch node
3	M/s Huawei Telecommunication India Pvt Ltd
3.1	Switching Node with N/W-N/W Interface at STM-1, SOFTX3000 with UMG 8900

हिंदी कार्यशाला

दूरसंचार अभियांत्रिकी केंद्र, नई दिल्ली में दिनांक 17.03.2016 को हिंदी कार्यशाला का आयोजन किया गया। इस कार्यशाला के अतिथि वक्ता श्री राजेश श्रीवास्तव, सहायक निदेशक (रा.भा.), स्वास्थ्य एवं परिवार कल्याण मंत्रालय द्वारा कंप्यूटर पर यूनिकोड इन्स्टाल करने, यूनिकोड की सहायता से हिंदी में कार्य करने तथा हिंदी के बारे में काफी रोचक एवं ज्ञानवर्धक जानकारियाँ उपलब्ध कराई गई।



हिन्दी कार्यशाला में भाग लेते अधिकारी एवं कर्मचारी गण

Activities at NTIPRIT (Jan.-Mar., 2016)

1. In-service training courses for DoT Officers were conducted at NTIPRIT on the following topics:
 - i. IPv6 awareness Course (22 Jan) (09 Participants)
 - ii. Electromagnetic Radiation (28-29Jan) (11 Participants)
 - iii. Training of Govt Officers in IPv6 (22-23 Feb and 15-16 Mar) (23 Participants)
 - iv. Workshop on Cyber security (22-23 Feb) (14 Participants)
2. Fifteen weeks of Foundation Course of the following batches of Officer Trainees of ITS/BWS started at IIPA Delhi from 21st March:
 - i. ITS-2012 Batch (14 officers)
 - ii. ITS-2013 Batch (4 officers)
 - iii. P&T BWS (Electrical)-2013 Batch (3 officers)
 - iv. P&T BWS (Civil)-2013 Batch (3 officers)
 - v. P&T BWS (Architect)-2010 Batch (2 officers).



Group Photo of ITS/BWS officers at IIPA, Delhi

3. Technical Modules of the ITS / BWS induction courses as per training calendar were conducted during this period.

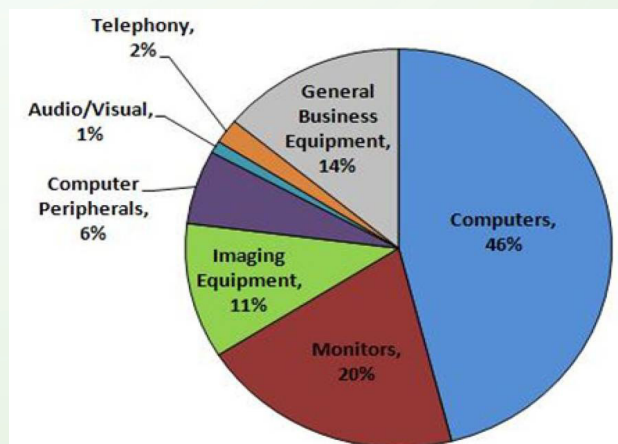
Study Paper on “Present Trends worldwide in ensuring Energy Efficient Telecom Equipment”

1.0 Introduction

In telecom networks “Green” refer to minimizing consumption of energy through use of energy efficient telecom technologies and renewable energy resources. Greening of telecom reflects in green telecom equipment, green manufacturing, environmental friendly design of telecom building, telecom mobile towers and safe telecom waste disposal.

Carbon footprint can be reduced by introducing energy efficient telecom products by telecom manufacturers and suppliers in the present market.

Global Scenario- Energy Consumptions in ICT



(Power consumption by telecom sector is 2%)

In this newsletter, there is an attempt to have a feel of vast evolving energy efficient technology trends worldwide in telecom field.

The information and communications technology (ICT) industry alone accounts for about 2% or 860 million tons of the world's greenhouse gas emissions.

The main contributing sectors within the ICT industry include the energy requirements of computers (40%), monitors (20%), imaging equipment (11%) and general business equipment (14%) of the total energy consumptions.

Many countries have initiated steps to reduce energy consumption and emissions in line with the Kyoto Protocol of 1997, which was signed by over 160 countries, including India, to reduce their emissions of greenhouse gasses by 5%, from the 1990 level.

2.0 Importance of Green and Energy Efficient Telecom Equipments

The importance of Green and energy efficient telecom equipments have risen phenomenally in recent past. In present scenario it is very much essential to have energy saving telecom equipments and networks.

The main emphasis is on :

- To reduce power consumption.
- To reduces Green house gas

Therefore, it is necessary to develop & evolve new energy saving technologies and to make energy efficient equipments. Further these equipments should be used in efficient & effective manner to reduce energy consumption and to increase throughput (power consumption level).

3.0 Global initiatives in energy efficient technologies

Different Technologies at their relevant level play significant role in energy saving and reduction in power consumption. These are:

3.1 Device level Technologies: The following are the important device level technologies.

a) Large Scale Integration micro fabrication: Smaller the Size of LSI Macro fabrication lesser the driving Voltage which results in reduction of power consumption (linked with square of Driving Voltage). With smaller size of LSI macro

fabrication, sufficient precaution about leakage current should essentially be checked.

b) Multi core central Processing Unit (CPU): In executing any work, multi low specs CPUs can save energy over single high specs CPU. The Energy Consumption is linked with cube of Clock frequency. The high performance multi-CPU helps directly in energy saving. The Multi-core CPU with Clock gating and sleep mode Control technologies help to control power supplies and clock rate. These can be configured for minimum required CPUs & the minimum Clock rate depending upon the load.

c) Clock Gating: At present, LSI and its circuits are using the clock depending upon the task requirements. When there is no task required, then there is no supply of clock thus saving the energy. There should be optimal transition between ON and OFF states because more energy is required in transition.

d) Power aware Virtual Memory: The energy consumption depends upon the demand and use of memory. If any energy efficient technology is used then it generally helps in buffering the cache memory.

e) Advanced power amplifier: In base station of wireless network, the Power amplifier consumes the largest percentage of total power. An efficient power amplifier helps in reducing power consumption. Energy can be saved with the help of a technology which is known as Digital Pre Distortion (DPD). Whenever distortion occurs in power amplifier, this technology helps to cancel the distortion in opposite direction.

3.2 Equipment Level Technologies:

This type of technology is applicable for a set of Devices e.g. router/ switches/ GPON/ GEAPON etc.

(1) Sleep mode: This technology helps in reducing the energy consumption when equipment and functions are put on sleep mode/not in use. It is applied at equipment level as well as network level. Equipment without sleep mode consumes constant energy depending upon the maximum traffic to be adopted. Sleep mode helps in saving power when less traffic implies. If traffic in parallel path is less then maximum, some traffic can be diverted into one path. The unconcerned (not in functioning) equipment to the path can be put on sleep mode to save energy.

Solution Available in Sleep mode are :

- (a) **Maintaining proxy:** This serve when network is in sleep mode and responds to routine network traffic.
- (b) Energy efficient Ethernet protocol developed by the energy efficient task force (IEEE 802.3az)
- (c) L2 Power saving mode combined with ADSL 2 and ADSL plus technology.
- (d) **In wireless network:** Sleep mode control software and operation are provisioned in mobile base station and devices. Sleep mode control software shutdown low traffic band for the cell / whole base station. Mobile devices during sleep mode operation changes the state from sleep mode to listening mode for reducing the power consumption of the battery.
- (e) **Adaptive link rate (ALR) and dynamic voltage scaling (DVS):** This energy saving provision mode for network equipment (ALR: interface link speed (Bit Rate)) is controlled by amount of traffic to be handled. In DVS: Driving voltage of the CPU, network interface card and hard disc should be controlled according to traffic to handle.
- (f) **CACHE SERVER:** When a user use contents multiple time or multiuser use the same content repeatedly, the avoidable traffic can be reduced if contents are cached. And it further reduces the band width.
- (g) **Sorry Server:** This type of server is used when unavailability of the service occurs due to temporary traffic congestion. Due to which some user may leave their demand & it will reduce the traffic.
- (h) **Shaping:** If the output rate of packets is lower than the potential link rate of control, then it will save the energy of the other subsequent nodes and these other nodes may be nearly operated to the maximum data rate.
- (2) **Smart Antenna Technologies:** The following are the various smart antenna technologies :-
 - (a) **MIMO (Multiple Input Multiple Out)** use smart processing algorithms with multiple arrays at both the transmitter and receiver. It can control the directionality of reception/transmission signal which reduces interference with other signals resulting in higher data transfer rates as compared to single input single output(SISO)

under same power budget and bit error rate performance.

- (b) **Compact Base Transceiver Stations (BTSs):** These types of base stations are fitted without ground shelters and cooling equipments which ultimately reduces the energy consumption. These BTSs support features like multiple antenna per sector with multiple input multi-output (MIMO) and beam forming.
- (c) **Optical Network Node:** It is an energy efficient technology for transmission interface and switching fabrics to a network node. Optical network node can handle speed of Tbps or more. This help in network energy efficiency by large amount of traffic aggregation along with node. Optical packet switching helps in improving the network energy efficiency because optical to electrical and electrical to optical translation is avoided which saves considerable amount of energy.
- (d) **Relay station:** This type of technology helps to deliver data at destination node with multiple wireless links. As each link has independent fading channels, diversity gains may be achieved which in turn improve the spectral efficiency. It also helps for reducing the time to transmit a fixed amount of data which further reduce energy consumption.

3.3 Network level Technologies: This level include those technologies which are applied in network, protocols applied for routing etc.

- (a) **Circuit switching:** As compared to packet switching, which is having energy consuming memory devices like SRAM and CAM for routing information, the circuit switching use less energy. circuit switching is more useful and efficient for streaming traffic (video streaming). However, The main draws back are :-
 - (i) every connection occupies line, even when there is less traffic. Traffic cannot be easily routed through remaining lines (resources),
 - (ii) the packet level statistical multiplexing function for link utilization cannot be handled by circuit switching which reduces the network energy efficiency.
- (b) **Burst switching:** In order to save energy at core routers, packets are prepared for data burst at edge routers. With this, the processing operation

at core routers decreases. Similarly, Optical burst switching results in better network utilization. With efficient utilization of bandwidth, the set-up is faster as compared to optical circuit switching. Further efficient processing reduces the operational energy consumption in core network.

(c) Transmission scheduling: Traffic/Packets buffer is reduced at the network nodes with the timing of packet transmission and to further minimize the waiting time at each node. Designed buffer capacity is important aspects to check packet loss. To regulate the network, timing of packet transmission for each node in multiple nodes environment should be seen. As a result, with optimum transmission scheduling, energy consumption may be reduced.

(d) Energy consumption based routing and traffic engineering: In this technology, Optimum use of traffic route is to reduce energy consumption network wise. Important process related to it are traffic aggregation, multiple path routing and network coding. With sleep mode concept, traffic aggregation to limited set of routes and remaining (unused nodes) to operate in sleep mode to save energy.

It takes care of protocols functionality along with protocols available in other layers (MPLS performed in IP network) traffic can be transferred by using lower-level simpler layers. It tries to simplify functionality of protocol e.g. extending IP capability from access network to backhaul to provide full IP network common platform.

(e) Content delivery networks: In order to deliver content energy efficiently, access server nearer than the (distant) main server is used to save bandwidth, energy and resources related to distance.

(f) Traffic peak shifting: It shows the maximum traffic transmission during off-peak hours which internally reduce maximum traffic accommodation in general.

(g) Small cell design: macro cell is replaced by micro cell, pico cell and femto cell. The small cell utilizes less energy. It can save energy for transmitting a radio signal. As power loss over a wireless channel is related to distance. Femto cell can provide better indoor voice and data coverage with lower transmit power. It has better signal to interference noise ratio.

(h) Energy consumption aware network planning: It deals with Network level design and planning for better energy efficient networks with the help of energy consumption report and network outage reports. Static part deals with physical network and routing policy to save energy, whereas Dynamic part play role in dynamic traffic management to attain maximum energy efficiency.

4.0 Energy Saving Certificate Practices World Wide

Broadly, there are two types of energy saving certificates: -

4.1 White certificates:- When determining the extent of energy saving, the energy use is compared against a baseline, which is an estimate of the energy use in the absence of any attempt at saving energy. In environmental policy, "white certificates" are documents certifying that a certain reduction of energy consumption has been attained. In most applications, the white certificates are tradable and combined with an obligation to achieve a certain target of energy savings.

A white certificate, also referred to as an Energy Savings Certificate (ESC), Energy Efficiency Credit (EEC), or white tag, is an instrument issued by an authorized body guaranteeing that a specified amount of energy savings has been achieved. Each certificate is a unique and tradable commodity carrying a property right over a certain amount of additional energy savings and guaranteeing that the benefit of these savings has not been accounted for elsewhere.

4.2 Green certificate:- A Green Certificate is a terminology used in Europe also known as Renewable Energy Certificates (RECs) in the USA, is tradable commodity proving that certain electricity is generated using renewable energy sources.

Typically one certificate represents generation of 1 Megawatt hour of electricity. What is defined as "renewable" varies from certificate trading scheme to trading scheme. Usually, at least the following sources are considered as renewable:-

- Wind (often further divided into onshore and offshore);

- Solar (often further divided into photovoltaic and thermal);
- Wave and tidal (often further divided into onshore and offshore),
- Geothermal, Hydro (often further divided into small - micro hydro and large),
- Biomass (mainly bio-fuels, often further divided by actual fuel used).

Green certificates represent the environmental value of renewable energy generated.

5.0 Various international energy efficiency testing standards for telecom equipments

- (a) **ETSI TS102533**: Energy consumption in broadband telecommunication network equipment. This is a Technical Specification. It defines the test methods and power targets for Broadband Access equipment.
- (b) **ETSI TS102706**: Energy efficiency of wireless access network equipment. This is a Technical Specification which defines the criteria for the assessment of power consumption in Wireless Access Networks.
- (c) Draft available at Working Group level DTS/EE-00022 Energy Efficiency of Wireless Access Network Equipment, is the revision of the present TS 102 706 to define efficiency parameters taking into account traffic load.
- (d) Draft available at Working Group level DTS/EE-00023 Measurement Methods for Power Consumption in Transport Telecommunication Networks Equipment will be a Technical Specification, which will define the measurement methods for power consumption and efficiency indicators for transport equipment.
- (e) CENELEC Liaison will be established with CENELEC JWG on the mandate M/439 on the standardization in the field of standby and off-mode power consumption measurement for energy using products.
- (f) ETSI ES 203 136 V1.0.0 (2013-03) Environmental Engineering (EE); Measurement methods for energy efficiency of router and switch equipment.

(g) ITU recommendation: L.1310 Energy efficiency metrics and measurement for Telecommunication equipment.

(h) ATIS-0600015.03.2009; (07/2009): Energy efficiency for telecommunication equipment:- Methodology for measurement and reporting for router and Ethernet switch products.

6.0 Conclusion

As the telecom infrastructure and telecom networks are growing exponentially, the energy efficient technologies have become the necessity of the day. The energy efficient technologies may bring changes for betterment of telecom component, equipment and network level development. Reduction in Green house Gas emission is now consider as corporate social responsibility (CSR) of telecom manufacturing industry and telecom operators.

Several countries like USA, China, France, India etc. have adopted reduction in carbon footprint as CSR and are working in this direction. Telecom network operators & equipments manufacturers are taking initiatives to gain competitive advantage by reducing the power requirements of their equipment.

References:-

1. ITU standards,
2. TRAI paper on green telecom
3. http://ec.europa.eu/energy/demand/legislation/doc/neeap/france_en.pdf
4. White certificates Source: <http://en.wikipedia.org/>

भावपूर्ण श्रद्धांजली

श्री पीयूष अग्रवाल, सदस्य (प्रौद्योगिकी) का दिनांक 15 अप्रैल, 2016 को दिल का दौरा पड़ने से आकस्मिक निधन हो गया। दुःख और पीड़ा की इस घड़ी में, टी.ई.सी. परिवार के सदस्य उनके परिवार के दुःख में शामिल हैं एवं परमपिता परमात्मा से प्रार्थना करते हैं कि दिवंगत आत्मा को अपने चरणों में स्थान प्रदान कर चिरस्थायी शांति प्रदान करें तथा उनके परिवार को यह दुःख और पीड़ा सहन करने की शक्ति प्रदान करें।



Important Activities of TEC during JAN 16 to MAR 16

New GRs/IRs issued

- GR on Controller, LAN Switches, Carrier Ethernet Switches and Routers for SDN
- GR on Integrated System , SD on eMS
- GR on 4.8 m and 6.3 m Earth Station Antenna system operating in C-band
- GR on 20W to 100W C-band Satellite Block up Converter (BUC), GR on 400W and 750W TWT High Power Amplifier operating in Ku-band
- GR on Lithium Ion Battery for Telecom Application
- GR on Ethernet Traffic Analyser up to 10G (Hand Held)
- GR on 40/80 Channel DWDM System with Channel Bit rates of 100Gbps for Core/Metro Network Applications

Revised GRs/IRs issued

- GR on Low Noise Block Converter in C-band
- GR on Local Multipoint Distribution system in 10.5 GHz, 26 GHz and 28 GHz frequency band
- GR on Hand Held Spectrum Analyser (100 Khz-3.0 GHz)
- GR on Radio Modem in ISM band
- GR on Solar Photo voltaic (SPV) Power Supply for Fixed Wireless Terminal & similar systems

DCC Meeting conducted

- IR on High Speed Line Driver
- IR on Ethernet to G.703 Interface converter
- GR on Call Center, Requirement of IPv6 in Core Network

Study/White Papers issued

- Smart Grid Security, Security in SDN Networks
- Wireless backhaul solutions for small cells
- Lightning and Surge Protection in Telecom Networks
- Emerging Optical Switching Techniques (Waveband Switching and Photonic Slot Routing)
- Energy storage platform, Energy efficiency testing of telecom equipment & Green Telecom
- Network Function Virtualization (NFV) and its impact on future Telecom Network, Intellectual Property Rights (IPR's) in the perspective of Telecom
- GL on Measurement Metrics and Measurement Methodology for GSM BS in Static mode for Green Passport

Approvals issued by TEC during the period from Jan 2016 to Mar 2016

Interface Approvals.....	03
Type Approvals	0
Certificate of Approval.....	0



ISO : 9001-2008

Certifications

issued by TEC

Type Approval (TA)

Interface Approval (IA)

Certificate of Approval (CoA)

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Other Activity

- National Working Group 15 & 17 meeting held in TEC.
- Meeting of Working Group on "Technology & Manufacturing Roadmap" held in C-DoT, Delhi.
- 13th meeting of core group for Green Telecommunications.
- One Contribution regarding ITU-T G.652D and G.657 was submitted to SG-15 of ITU -T.

Representation of TEC in Training/Seminar/ Meetings

- ITU-T SG-12 & 15 meetings at Geneva
- Wi-Fi India, Digital India 24th Convergence summits-2016 held in New Delhi
- Meeting on Future Development in Telecom sector held in CSOI, New Delhi
- Conference on Spectrum Management held in New Delhi
- Workshop on EMF Measurement for 3G, 4G stations held in DoT
- EU Training on RED, LVD & EMC directives in Feb-16

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टी ई सी संचारिका : दूरसंचार अभियांत्रिकी केन्द्र
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