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GOA STATE CENTRE

*"97 Years of Relentless Journey Towards
Engineering Advancement for Nation Building"*

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FROM CHAIRMAN'S DESK

It is indeed a honour for me to write in this "ENGINEWS" issue being published on the occasion of **World Water Day 2017**.

Friends, as you are aware, more than 80% of our waste water flows back to nature untreated. Instead of wasting it, we need to reduce & reuse waste water & make the water cycle work better for every living thing. With this intension, we have invited Er. K. B. Wadhvane, an expert in Waste Water Sector to present his views and interact with us. It is our moral responsibility that everyone among us takes active part in reducing & reusing waste water in the best possible way.

Myself, along with the Hon. Secretary had the opportunity to attend Interactive Session at ESCI, Hyderabad wherein we could meet the Chairman & Hon. Secretaries of over 50 State & Local Centres of IEI coming from different places right from Jammu & Kashmir to Andaman & Nicobar & from Ahmedabad to Manipur. It was a mini India. We could discuss a lot of issues which were of common interest. The Interactive session was chaired by SOURESH BHATTACHARYA, VSM (RETD). SECRETARY & DIRECTOR GENERAL. He presented the issues such as Bye laws & Regulations, Technical matters, Membership, EEA, Finance & Administrative parameters on Best Centre Award, Election etc. The session was very much fruitful.

IEI, Goa State Centre has been entrusted with the responsibility of organising **25th Convocation of IEI & National Convention of Students'**

Chapter & Technicians' Chapter on 28th & 29th October 2017.

The event would be attended by President IEI, Secretary & Director General, Deputy Director General and other Directors of IEI. All the Members are requested to contribute in organising the event successfully.

The thrust of IEI has been on Membership issue. We have been pursuing the membership issue with Engineering Institutions in Goa for formation of students' Chapter. Already Don Bosco College of Engineering has established a Students' Chapter in Mechanical Engineering. Recently DBCE Students' Chapter Students have taken up a study tour to Kaiga power generating station as a part of their Curriculum. On the occasion of World Science Day on 28th February, a Students' Chapter in Mechanical Engineering has been established at Government Polytechnic Panaji. I was invited to chair the program as Chief Guest.

On 1st March, a meeting of the Co-coordinators from the Technical Institutions in Goa was convened for enrolling them as Institutional Members. The Co-coordinators from the Technical Institutions have shown deep interest to join the IEI.

I request all members to invite at least one NEW member to join us in this relentless journey towards engineering advancement for nation building.



Er. Gurunath M. Naik Parrikar, FIE


Activities At DBCE Students' Chapter



Industrial Visit to Kaiga Atomic Power Station & Kadra Dam

The Department of Mechanical Engineering of Don Bosco College of Engineering organized an Industrial Visit to **Kaiga Atomic Power Station & Kadra Dam** in association with **The Institution of Engineers (India), DBCE students' chapter** for third and fourth year mechanical engineering students on **28th January 2017**. Students had the opportunity to hear and learn from the training officials regarding the geometrical structure of the plant, its construction and working, the method of power generation and the safety and security measurements. A detailed presentation on the 'Nuclear Power Plant Aspects and Radiation' was given by **Shri U.P. Subramanya kumar, Scientific Assistant F**, bringing out the advantages of nuclear energy. Students were taken to the simulation center where one can learn actual simulation of controlling and keeping track with the operations of entire power plant using computer with specific software like UNIX, SCADA. On their return journey the students also visited Kadra Dam. Asst. Prof Sharad Shanbhag, Asst. Prof Manjunath Narwate, Prof. Suraj Marathe and Prof. and HOD Ajit Salunke accompanied the students in their visit.







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Talk on “Diesel engine technologies over Indian Railways”

On 3rd March 2017, the Department of Mechanical Engineering of Don Bosco College of Engineering organized an expert talk for third and fourth year mechanical engineering students in association with The Institution of Engineers (India), DBCE Students' chapter on “Diesel engine technologies over Indian Railways” by Dr. Suresh D. Mane, FIE & Principal, Girijabai Sail Institute of Technology, Karwar. The topics covered during the talk were Diesel Engine construction/components, New Technological features in Locos and New Technologies in Diesel Engines. Dr. Mane explained the various paths of cooling-air flow required in a normal Turbo supercharger installation. He said that Indian Railways operates 12000 trains every day and half of them are hauled by the diesel locomotives.

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“Applications of energy Management & Audit”

On 10th March 2017, the Department of Mechanical Engineering of Don Bosco College of Engineering organized an expert talk for BE Mechanical Engineering students in association with The Institution of Engineers (India), DBCE Students' chapter on “Applications of energy Management & audit” by Dr. Jagannath Hirkude, HOD-Mechanical, PCCE, Goa. He explained students about the general aspects of energy management and the various areas of studies for an energy auditor like energy efficiency in thermal utilities namely boilers, furnaces, FBC boilers, waste heat recovery etc. He also explained about the energy efficiency in electrical utilities like electric motors, compressed air system, fans and blowers, cooling towers etc. He showed the method of conducting energy auditing by considering a case study.

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IEI Scholarship

Mr. Adrian D'Souza, student of first year Mechanical Engineering of DBCE received IEI Scholarship for the year 2016-17

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Voice over LTE: A Cellular Master-stroke

- Deepak P Chodankar
Sr VP and Technology Evangelist

Recently when some of the cellular operators announced a new service called “Voice Over LTE”, one half the population of cell phone users went euphoric while the other half remained nonplussed. The former perhaps knew the significance of the service, the latter did not know what this new service is to be eaten with. Unmindful of the public perception, the claims made by each of the operators varied significantly, yet one aspect remained common to all of them, that is, all of them were to offer High Definition Voice as against the present day standard definition voice. What it actually meant was that over the normal cell phone calls, the user would get to listen to CD Quality voice with high depth as against the present one, which is generally considered as shallow with no “steel” in it.

Well, that gave rise to several questions, the first and the foremost being, who in the first place asked for a High Definition clarity for normal voice calls when the present 2G and 3G voice quality had been doing so wonderfully? Ever since technical stability was achieved in cellular operations, not many complained about the quality of voice as much as they used to be sore with call drops and the range issues. Historically speaking, the superiority of 2G or 3G voice was by no means an easy technological achievement. Years of research efforts were spent just to refine the voice delivery. Over the past decade or so, the

voice delivery has remained bullet proof and non-withering even in rains and storms, call handovers (while crossing the cell boundaries) have happened without any glitches, as much as that the variations and emotions in tones also could be delivered perfectly. Though nobody was expected to listen to top level concerts and orchestras over the cell phones yet on many a occasion, they have helped deliver the concerts live to the audiences across the continents. So when such a time tested voice delivery service is available over the present networks, then why bring in something High Definition that not many need or are unaware of. As a rule when a new service comes, it does not come alone but brings with it many more add-ons. And in order to incorporate these, at the barest minimum a user has to necessarily go in for upgrades including change in mobile set. That he has to shell out extra just to get these new features as well as additional charges for utilization of these extra features is yet another story in itself.

Voice Over Long Term Evolution (VoLTE)

But come what may, new technologies will keep coming whether one wants them or not. Obsolescence is an inseparable part of modern technology. 2 G Voice networks have served us for a long time and have outlived themselves. The new voice services, Voice Over LTE (VoLTE), will be delivered over the new

upcoming 4G LTE Networks.

The terms LTE, 4G, GPP though otherwise common in telecommunication parlance, yet they are quite puzzling and confusing.

The Long Term Evolution (LTE) was developed by 3GPP. Now 3GPP is a 3rd Generation Partnership Project which is a collaboration between groups of telecommunication associations or partners. After successfully developing Third Generation (3G) mobile phone system specifications based on then evolved GSM (Global System for Mobile Communications), 3GPP is quite a force to reckon with. Originally LTE was developed as a fully IP (Internet Protocol) based Cellular System for Data alone. Voice was not to have been part of LTE at all. Cellular Operators on LTE were to carry the voice through the traditional 2G or 3G systems separately. However the LTE operators were quick to react as this dual network operations would have caused them enough of difficulties, operational as well as management. Secondly this fragmentation would have led to several incompatibility issues amongst the multiple operators. Thus Voice over LTE (VoLTE) was devised as a way out where in which the operators could pack the data as well as voice on the same standardized network. However it was easier said than done.

VoLTE Techniques

In order to deploy voice over LTE a number of systems were proposed, studied, analysed, discarded, adopted and finally just a handful were accepted.

Under 3GPP specifications 23.xx a technique called Circuit Switched Fall Back (CSFB) has been standardized. In this scheme, before a voice call is initiated, a variety of call routines are executed for the voice circuit to fall back to 2G/3G connection. Subsequent to this is the voice call established. The CSFB also allows SMS to be carried through a specialized interface.

Yet another technique called Simultaneous Voice LTE (SV-LTE) provides the same facilities as CSFB but more importantly it allows simultaneous flow of data as well as circuit switched voice. A serious drawback of this technique is that it requires two radios to run at the same time within the mobile handset which drains out the battery quite quickly, creating a serious issue.

And finally the VoLTE scheme which uses the IP Multimedia Subsystem (IMS). The IMS is an IP based framework that helps deliver rich Multimedia services over Internet Protocol quite seamlessly. Else one would have to use several independent applications running concurrently. Despite all the odds and implementation complexities, the IMS based VoLTE has firmed up its position and has come to stay.

VoLTE – The IMS way

The IMS is a complex subsystem. The concept for a VoLTE using IMS was initially rejected by many operators as it was seen to be very expensive and arduous to implement and maintain.

However quite a few of these operators also could see lot of value in it and decided to rework on it to eliminate the inadequacies. The big names like AT&T, Nokia, Alcatel and others collaborated to develop what is called One Voice Profile for VoLTE. The IMS was cut to the size making it quite compact and elegant, while retaining the required functionalities. Now quite a few application suites could be conveniently integrated with the VoLTE. The GSMA World Congress complimented these efforts and announced its support and acceptance to this One Voice Profile.

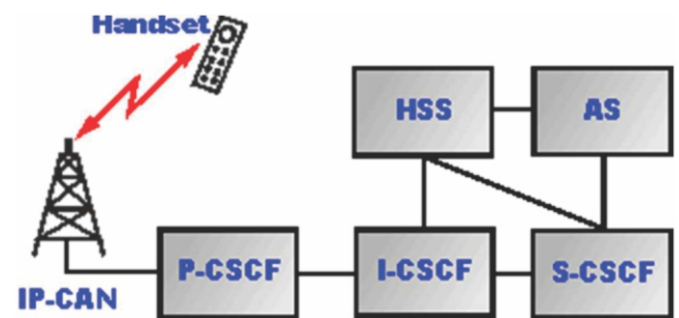


Fig 1 : VoLTE Components

Reference to Fig 1 shows a few essential ingredients of a typical IMS based VoLTE deployment.

IP-CAN is an IP based Connectivity Access Network which is connected to the user through the proxy P-CSCF (Proxy Call State Control Function). All the SIP (Session Initiation Protocol, used during setting up of IP Calls) signalling to and from the user is routed through P-CSCF. The S-CSCF (Serving Call State Control Function) is an important component of the system as it houses a number of interfaces to enable it to communicate with other entities within the overall system. AS, the Application Server handles the voice as an application. HSS the Home Subscriber Server is the main subscriber database which contains the subscriber details and are provided to the other entities within the network. The subscribers in turn are granted an access or denied, depending upon their availability status.

The VoLTE call processing is simple and straight forward. The calls are processed by the subscriber's S-CSCF and the connections are established through the P-CSCF.

Another important requirement of VoLTE is that it should work with the legacy circuit switched networks in a seamless manner, using only a single radio in the handset. A system called Single Radio Voice Call Continuity has been in use for the same.

Furthermore the IP versions to be used in VoLTE also play a significant role as some of the networks have already switched over to IPV6 from IPV4. The VoLTE devices have to support both, IPV4 and IPV6, by operating in dual stack mode. Yet another issue that needs to be handled is the "overhead" resulting from the IP Header which makes the packets bulky. To address the issue the Robust Header Compression protocol is

used to compress the voice data packet headers.

VoLTE- The Way Forward

All in all, Voice Over LTE is evolving and hopefully shall shortly be able to build enough of wherewithal to replace the present day cellular voice systems fully. The customers will be in position to derive quite a few benefits through VoLTE though for some of them he will have to wait for a while. An immediate benefit will be the High Definition voice delivery that VoLTE is being promoted for. The users will simply love the crispy, clear voice delivered with all the traits and variations in the original voice retained. Calls will get established fairly quickly and call drops

will be a thing of past. Simplified billing will be yet another relief to the consumers as they will get rid of tedious details of charges towards talk-time, call-minutes, SMS etc. The consumers will be charged for "Data Usage" alone as voice, SMS will be carried as data. With the refinements coming in, battery power retention will be longer and energy management will be highly effective. The cellular operators will be able to manage and operate their networks quite efficiently and their uptime is expected to be very high. The bandwidth and the spectrum management will be highly optimized. Overall it will be a win win for both, the operators and the consumers, with better value for money services.



Celebration Of National Science Day And Foundation Day At The Department Of Fabrication Technology And Erection Engineering Of Government Polytechnic Panaji

Foundation day of (Fabrication Technology and Erection Engineering Department of Government Polytechnic Panaji) FTEE and National Science Day was celebrated on 28th February, 2017, at Government Polytechnic Panaji, where we have the IEI Goa State Centre located within the campus..

Dignitaries present were Er. G. M. Naik Parrikar, Chairman, IEI, Goa State Centre, Chief Guest, Mr. G. R. Akadas, Director MSME Goa, as guest of honour, Expert Speaker Mr. Pradip Sarmokadam, Member Secretary, Goa Board of Biodiversity. FTEE Alumnus, Industrialist Mr. Atul Pai Kane also joined the gathering.

On this occasion, the Technology Business incubation centre and **IEI Students' chapter (Mechanical)** were launched. Students

gave overwhelming response to exhibit their science based projects, which were displayed at the venue.

Er. Parrikar stressed upon involvement of students in IEI day-to-day activities and briefed the gathering about the various ways in which establishing the IEI Students' chapter will be beneficial to them. Er. Parrikar explained to the students the schemes available for students to avail.

Mr. Akadas elaborated the various schemes of Central government available to all entrepreneurs across the country under the umbrella of MSME.

Mr. Sarmokadam highlighted the need for continuous improvement and enlightened the objectives of celebration National Science Day.



Dignitaries on the Dais: Mr. Pradip Sarmokadam, Mr. G.R. Akadas, Er. G.M. Naik Parrikar and Principal L.R. Fernandes



Er. Gurunath M. Naik Parrikar delivering speech as Chief Guest



I/C Head of FTEE Department Er. R. L. Chary Nachinolkar, addressing the gathering



Launching of GPP Students' Chapter (Mechanical) at the hands of Er. Gurunath M. Naik Parrikar



Interactive Session at ESCI, Hyderabad

IEI HQ had organised an Interactive Session for the newly elected Chairmen and Hon. Secretaries of

IEI State and Local Centres at Engineering Staff College of India (ESCI) on 19th February 2017.



Interactive Session



Chairman & Hon. Secretary attending the Interactive Session.



Er. Souresh Bhattacharya, VSM (RETD). Secretary & Director General, IEI presenting the issues.



Er. G. M. N. Parrikar, Chairman, IEI, GSC sharing the views.

Myself, along with the Hon. Secretary had the opportunity to attend the Interactive Session at ESCI, Hyderabad wherein we could meet the Chairmen & Hon. Secretaries of over 50 State & Local Centres of IEI coming from different places right from Jammu & Kashmir to Andaman & Nicobar & from Ahmedabad to Manipur. It was a mini India.. The Interactive session was chaired by Souresh Bhattacharya, VSM (RETD). Secretary & Director General, IEI. The issues related to day to day affair such as Bye laws &

Regulations, Technical matters, Membership, EEA, Finance & Administrative parameters on Best Centre Award, Election, AGM, Guidelines about the activities of the Centre, etc. were explained by SDG with the help of PPT.

Interaction on other issues of common interest took place wherein we had the opportunity of expressing our views. The session was very much fruitful.



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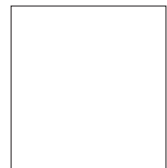
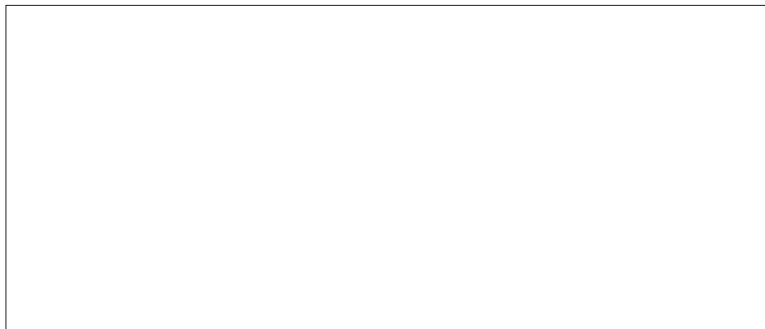
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