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(FOR PRIVATE CIRCULATION ONLY)

# **S P E News Letter**



## **2016 - 17, Year of Seminar & Workshop**

A QUARTERLY PUBLICATION OF THE SOCIETY OF POWER ENGINEERS (INDIA)

**THE SOCIETY OF POWER ENGINEERS (INDIA)**  
**VADODARA CHAPTER (ESTD. 1996)**

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*With Best Compliments From :*



## **POWERING GUJARAT**

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As a part of reform process, Gujarat Electricity Board (GEB) was unbundled in 2005 into various state owned power utility companies and Gujarat State Electricity Corporation Limited (GSECL) has taken up the responsibility of electricity generation.

### **SALIENT FEATURES**

- ❧ A Wholly Owned Subsidiary of Govt. of Gujarat
- ❧ Installed Capacity 6394 MW
- ❧ 1x800 MW Super Critical unit under Implementation at Wanakbori TPS
- ❧ Generation of Clean & Green Power
- ❧ Prime Minister Award Winner - Innovative & Unique 1 MW Canal Top Solar Power Project
- ❧ 6400 MW Power Projects under Planning
- ❧ Captive Mining
- ❧ Use of Better Coal Matrix – Washed & Imported Coal
- ❧ Optimum Fly Ash Utilisation



# **Gujarat State Electricity Corporation Limited**

**Regd Office:** Vidyut Bhavan, Race Course, Vadodara - 390007 (Gujarat)

[www.gsecl.in](http://www.gsecl.in)



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3. Er. SM Godkhindi	Secretary	9. Er. ND Makwana	Member
4. Er. DC Mehta	Jt. Secretary <sub>(Corporate)</sub>	10. Er. GP Shukla	Member
5. Er. JD Wadhwa	Jt. Secretary <sub>(Academy)</sub>	11. Er. NG Yadav	Member
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## SPECIAL INVITEE TO THE EXECUTIVE COMMITTEE

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## ACKNOWLEDGEMENT

SPE(I) Vadodara received **donations as** under:

- |  |                  |
|--|------------------|
| 1. <b>Er. Mrugen G Mehta</b> Life Member | <b>Rs. 2,000</b> |
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SPE(I) Vadodara Chapter thanks to above donors. SPE(I) further expects similar gesture from other members as well as from the well-wishers

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## From The Chairman's Desk

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At the outset I wish all the readers a very happy and prosperous New Year-2017. The year is started with very important news for the engineering community in the country. It is proposed by government to conduct

exit test for engineering students passing out from all engineering colleges in the country. This test is mandatory and may be instrumental in bringing about standardization in teaching from different engineering colleges.

The proposal is based on the fact that most of the graduating students lack knowledge of engineering they learnt during college term. The surveys conducted by responsible agencies stated that nearly seven lacs of students are produced every year and only 20% to 30% of them are able to get a decent job. This reflects poorly on the quality of education being imparted by engineering colleges in our country. There are nearly three thousand engineering institutes across the country, which use different tools and techniques to teach and test the skill of students. The exit test which government is serious about, will help assess standard of education in all the colleges and will be able to take remedial measures to improve the quality of teaching by giving training to teachers, improving infrastructure, industry involvement etc.

The factor responsible for poor quality in education is for the fact that many of these colleges are established as commercial venture without much regards to the infrastructure as well as quality of teaching. IITs in our country are regarded as best in the engineering education and the students graduating from IITs are really employable with very respectable pay package in India and abroad. However, in bid to open more IITs hurriedly, government converted few engineering colleges with sub-

standard infrastructure, compromising quality to IIT.

It is expected that mandatory exit examination in their final year, will test student's attainment levels. Government is to evaluate their performance in this examination to determine their employability, as their scores may be shared with prospective employers.

The issue is being discussed by All India Council for Technical Education (AICTE) and it may soon issue appropriate regulation and modalities for the engineering colleges. If the colleges fail to comply with the regulation, they might face the risk of losing approval status.

The Society of Power Engineers(I), Vadodara, which is the foremost Chapter in the country, has been feeling this gap in engineering education for two decades now and is undertaking many programs for students for their skill building in association with colleges in Gujarat. Very recently two such programs were successfully completed in association with Parul Institute of Technology and Morbi Engineering College. Many colleges are being contacted to take advantage of such training programs which are imparted by highly experienced faculty members from SPE(I). However, we strongly feel that such training should be included in their curriculum. Let us all start working in this direction.

We have engineer members from Electrical, Mechanical, Chemical, Civil, Structural, Computer, IT, Metallurgical and other streams. SPE(I) Vadodara can surely assist colleges in raising the level of knowledge of passing out students.

Through this column, I appeal all the members to come forward to share their knowledge with the students and Academy. You may please contact office bearers of the Vadodara Chapter.

**G V Akre**

*With Best Compliments From :*



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## Editorial

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Dear Friends,

### Let us continue discussion on "CHANGE".....

We all know that electrical energy sources are limited. The stock of Coal, Oil and Gas will last for short period and it is now time / mandatory to look for the alternate source of electrical energy. Wind is one of the sources, but it varies frequently in a day, which you might have experienced in this "MAKAR SANKRANTI" festival on 14-15 January 2017. Hence it is not so reliable. Another source is TIDAL WAVES OF SEA, which are also not so reliable. The third source is SOLAR POWER. We have commenced its use and as on December-2016; total 1159 MW capacity Solar Power Plants are installed in Gujarat. If you observe at national level, the total installed capacity of Solar Power Plants in India is 9012 MW till December-2016.

So far Gujarat or India is concerned; we have several options for installation of Solar Plant like Open Land, Narmada Canal, Roof-Top etc. But recently a new concept is put in operation i.e. the world's first "SOLAR HIGHWAY" is inaugurated in December-2016 in FRANCE. The road is paved with solar panels providing enough energy to power the street lights of the small Normandy town of Tourouvre in France.

This one-kilometre (Half mile) "Watt way" was covered with 2,800 square metres (30,000 square feet) of resin-coated solar panels. An average of 2,000 cars use the road in Tourouvre each day for testing the resistance of the panels for the project carried out by French civil engineering firm Colas. They are waiting to see whether the panels can withstand the impact of time and weather, as well as the loads they can take from big trucks.

One drawback of the system is that solar panels are more effective when angled towards the sun, typically on slanted rooftops, than when they are laid flat.

This new use of solar energy takes an advantage of large infrastructure of road already in use to produce electricity, without any extra cost.

This idea, which is also under exploration in Germany, the Netherlands and the United States, is that roadways are occupied by cars only around few hours of the day, providing vast exposure of surface to soak up the sun's rays for the remaining time.

Let us hope for similar idea to be explored in India shortly because we have large road infrastructure and we can save costly land for other use.

**DC Mehta, Editor**



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## MEMBERS IN NEWS

**Er. S. M. Takalkar** Vice-Chairman of SPE (I) was honoured by Gujarat Energy Transmission Corporation during an annual function for his sincere, valuable and consistent contribution to the growth of company (GETCO) during his long tenure of 34 years in GETCO.

**Best Wish to Er. Takalkar**





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## PGVCL AREA MAP



## PGVCL AT GLANCE

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## Chapter's Activities



- On **03 Oct 2016**, Chapter organised a **Satyanarayan Pooja** to celebrate the foundation day of the Chapter. The pooja which was organized at the office premises of the Chapter, was well

attended by members and their spouse. The pooja was performed by **Er. SM Takalkar**, Vice-Chairman of the Chapter and his better half **Mrs. Purnima**. The members and their family availed prasad and greeted each other.

- On **10 Nov 2016**, the Chapter celebrated **Power Day** to commemorate the beginning of the electrical power system in India. A small Hydro Power Station was commissioned in Darjeeling on 10 Nov 1897. **Er. HN Baxi**, Executive Director, GSECL, Vadodara spoke on the topic of "**Fuel Management in Thermal Power Plants**". The speaker gave details of the sources and transportation of fuel and also cost effective fuel management in the era of **Open Access** and **Power Trading**. He also presented statistics of fuel and power generation in the state and the country. The lecture was organized at Vasvik Auditorium, the IE(I), Vadodara. The members appreciated the talk.
- On **10 Dec 2016**, the Chapter celebrated **Energy Conservation Day**. Experts and exponents in the field of Energy Efficiency and Conservation were invited to give talk and present case studies.

First presentation was made by **Dr. Sagar Agrawat**, Senior. Scientist, GERMI, Ahmedabad. His presentation covered following:

- The GoI has an ambitious plan to add **100,000MW Solar Power** in to the Grid in next few years.
- If the total solar energy is tapped in reality, it is 1800 times more than the Global Power requirement.
- Direct utilization of solar energy includes mirror reflectors for cooking, special engines, power towers etc.
- He briefed about GERMI's flagship

programs and commercial aspects of solar power generation.

Second presentation was made by **Er. Bharatbhai V Shah**, proprietor of M/s Poly-phase Motors, Vadodara. In his brief presentation, he stressed the need for energy efficient motors in every part of power utilization. He stated that large quantum of power/energy can be saved by utilizing energy efficient motors.

The third speaker was **Er. JA Patel** working with M/s Akaish Mechatronics Ltd., a company engaged in the business of Energy Audit.

He spoke on his personal experience in Energy Audit and exhibited by calculations, the amount of energy and money which can be saved by following the energy audit report.

The last speaker for the evening was **Er. KS Shah**, Chief Manager (Elect.), GNFC, Bharuch. His presentation covered the following.

- Various steps taken up by GNFC to conserve the energy
- Variable speed drives and their effect on energy saving.
- Use of high efficiency motors by GNFC
- Training to staff for energy conservation
- Use of LED for lighting and replacement of existing fans by 5-Star rated fans.
- Role of BEE in saving energy by introducing star rating
- Case study of replacement of 350kW motor by small motors and saving of 105kW.

**Dr. BG Desai**, an expert and exponent in the field of Energy Conservation, Audit and Management summed up the event which was organized at Vasvik Auditorium, the IE(I), Vadodara.

The programme was designed by **Er. BN Raval**, Executive Committee Member

- On **18 Dec 2016**, in the morning the All India AGM of SPE (I) was held at Vadodara in the auditorium of GETRI, Gotri Road, Vadodara. 75 members (from Vadodara Chapter) attended the meeting. Report of the AGM is brought out in this issue.

Also in the evening, the Chapter organized a **Cultural** event and **Dinner** for **Members** and their **Spouse** to commemorate the completion of 20 years of the incorporation of SPE(I) Vadodara Chapter. The musical evening was staged by Mrs. Pallavi Joshi and her troop. They rendered hit film songs of yesteryears, gazals and light songs. During the break in the cultural programme, **Er. PA Shah**, Life Member was felicitated with "**Engineering Merit Award-2016**" for his

meritorious service to the Power Sector by presenting **Citation**. Er. GV Akre-Chairman and Er. SM Godkhindi-Secretary of the Chapter felicitated him. Past employees and other individuals who helped the Chapter over 20 years were also felicitated. The **Senior Life Members** (as detailed hereunder) of the Chapter who completed 65 years of age on 31 Aug 2016 were also felicitated by presenting a shawl to them by the office bearers of the Chapter.

GR No.	NameShri...	GR No.	NameShri...
2038	Acharya Kalapi H	183	Shah Rajendra S
2039	Amin Dilipkumar S	2126	Joshi Suresh P
417	Shah Mahesh S	1365	Dadich Ram D
1681	Shukla Prakash B	488	Chaudhari Suhas D
27	Vyas Mahendra H	2125	Amin Rajnikant B
2064	Kavaiya Kanti D	642	Shah Dilipkumar J
1682	Shah Kaushik R	1455	Jani Vasantkumar A
1305	Shah Satish K	340	Trivedi Ashvinkumar B
40	Harani Vasudev B	723	Shah Ashokkumar A
1536	Karode Anil P	731	Parikh Ashokkumar R
2094	Patel Chimanlal K	220	Dave Kiritkumar S
2131	Bhavsar Piyushkumar R	118	Kulshrestha Pravinchndra O
350	Patel Pankajkumar K	1903	Shukla Pradhyuman M
528	Shah Haresh M	243	Brahmbhatt Rameshbhai B
1991	Tilwani Harilal D	218	Gajjar Bhupendrakumar C
189	Patel Mukesh S	1914	Parikh Nareshkumar K
96	Bankar Rajendra P		

The Vadodara Chapter has also honoured late Shri Nalin Bhatt, Ex. Chairman, GEB for his contribution in the growth of SPE (I) (Vadodara Chapter). His son Shri Dhaval Bhatt accepted memento on behalf of his late father. Er. N. Dinker founder President, Er. S.K. Negi, MD GETCO and President - All India SPE(I) and Er. P.J. Thakkar Member (Technical) GERC, were also felicitated during the cultural programme.

The programme came to an end with a grand dinner, which was organized in the Auditorium of Baroda High School, Alkapuri, Vadodara. The event was anchored by Er. RN Purohit.

#### **CHAPTER'S ACTIVITY TO BRIDGE ACADEMICS WITH INDUSTRIES**

The Chapter had organized different programmes for the benefit of College Students from Electrical / Electronics wing during first quarter of the year 2017.

Er. PA Shah – Life Member approached the colleges on behalf of the Chapter and 2 colleges agreed for the programme. The details of the program are as under.

##### **1) 5-Day Workshop – LE College, Morbi – 08 to 12 Jan 2017**





The workshop, "**Industrial Practice in the field of Electrical Engineering**", was organized by the Chapter, in which initial 2-Days were for lectures at GETRI and balance 3-Days were for power system & Power Plant visits. Total 40 students with 1 Professor participated in this workshop. The lectures were delivered by following Faculties on the topics shown against each:

Lecture No	Faculty Shri...	Subject
<b>08 Jan 2017</b>		
Lecture 1	SM Takalkar	Substation Design & Engineering
Lecture 2	PA Shah	Energy Management & Audit
Lecture 3	HM Dabla	Turbines in Power Plant
Lecture 4	PA Shah	Hydro Power Station
Lecture 5	VJ Desai	Engineering of Instrument transformer
<b>09 Jan 2017</b>		
Lecture 6	DC Mehta	Construction of Transmission Line
Lecture 7	AK Malek	Electrical Safety
Lecture 8	VJ Thakar	Protection Relay for Plant & Switchgear
Lecture 9	SM Godkhindi HM Solanki	Distribution system and Automation
Lecture 10	KN Velani	Engineering of GIS Substation

During Lecture Sessions, **Er. BB Chauhan** and **Er. BB Mehta** - the Chief Engineers of GETCO were invited to address students, who appreciated the efforts of SPE(I) for knowledge sharing. **Er. Karandikar**, Director GETRI was guest of honour during concluding session.

#### **Power System and Power Plant visits:**

Date	Subject	Visit Place
10 Jan 2017	Hydro Power Plant & GIS substation Visit-1	Sardar Sarovar Narmada Project, Kevadia
11 Jan 2017	Power System Visit-2	State Load Despatch Centre
	Power System Visit-3	400kV Asoj Substation
12 Jan 2017	Laboratory Visit-4	HT Meter Testing Laboratory of MGVCL-NABL Accredited
	Power System Visit-5	Vadodara City SCADA system by MGVCL
	Power Plant Visit-6	Solar Power Plant - Canal Top - Sama, Vadodara

Very good response received from the students. Few feedback points are reproduced here:

- ✓ **We invite you to arrange some programme into our college and if possible then together we may start Student Chapter.**
- ✓ **Some lectures are excellent & clear all concepts.**
- ✓ **Everything is good.**
- ✓ **Experienced closeness to environment of level of knowledge.**
- ✓ **Some video presentation required.**
- ✓ **Really good initiative taken to bridge Academics with Industries. Such practical knowledge will help students to grow professionally as well as personally.**

Chapter is trying to improve from the feedback points. The Chapter is thankful to all Faculties for their keen interest in taking good lectures. The Chapter is also thankful to other supporting members namely Er. NG Yadav, Er. NC Solanki, Er. AH Dhebar etc.

#### 1) 4-Day Workshop – Parul University, Waghodia – 06 to 09 Mar 2017



Group photo of Parul University students at Trivedi Associate's Training Centre at Nana Fofalia, Nr. Vadodara.

4-Day workshop was organized by the Chapter titled **"Hands-on Training on Power System and its upcoming Scenario"** for Parul University students.

During all 4 Days, Power System, Industrial and Discom System related visits were arranged. Total 40 students (19 students of PIET and 21 students of PIT) with 1 Professor on each day participated in this workshop.

The visit programme was planned as under:

Date	Subject	Visit Place
06 Mar	Power System Visit-1	State Load Despatch Centre, Gotri
	Industrial Visit-1	M/s. Trevide Associates Vocational Training Centre, Nana Fofalia
07 Mar	Power System Visit-2	400kV Asoj Substation
	Industrial Visit-2	M/s Highvoltrans, Halol
08 Mar	Discom Laboratory Site Visit-1	HT Meter Testing Laboratory –NABL-Accredited
	Discom Control unit Site Visit-2	Vadodara SCADA System by MGVCCL at Subhanpura
09 Mar	Power Plant Visit-1	Wanakbori (GSECL) Thermal and Small Hydro Power Station

Very good response received from the students. The Chapter is thankful to the supporting members namely Er. PA Shah, Er. Urmila Shah etc.

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### 1) 5-Day Workshop – LE College, Morbi – 14 to 18 Mar, 2017.

The workshop, "**Industrial Practice in the field of Electrical Engineering**", was organized by the Chapter, in which 2-Days were for lectures in the Auditorium of DEEPAK FOUNDATION, NH-8, Vadodara and balance 3-Days were for Power System & Industrial visits.

Two batches of Total 50 students with 2 Faculty Members participated in this workshop. The lectures were delivered by following Faculties on the topics shown against each:

Subject	Faculty Shri...
Construction of Transmission Line	DC Mehta
Induction Motor & its Controls	RN Purohit
Distribution System	SM Godkhindi& HM Solanki
Hydro Power Station & Solar Power Station	PA Shah
Power Plant Auxiliaries & Ancillaries	VJ Thakar
Instrument transformers – CT, PT, CVT	GV Akre
Power Transformers	AR Shah
Electrical Substation Design & Engineering	DC Mehta
Turbines in Electrical Power Plants	KH Joshi
Electrical Power Stations – Overview	PA Shah

During inaugural session, Er. SM Takalkar – Vice Chairman, SPE(I)-Vadodara briefed on power system and scenario of day to day working in view of need of power.



Two Batches of 25 students in the classroom of Deepak Foundation



Faculties Er. RN Purohit, Er. KH Joshi, Er. PA Shah and Er. DC Mehta delivering Lectures



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Very good response received from the students. Few feedback points are reproduced here:

- ✓ **If I get a chance again, I will be very glad to have an opportunity.**
- ✓ **Amazing & Fabulous training. Everything is excellent. Satisfied with the faculty provided.**
- ✓ **Food was very good and tour well organized during visits.**

The Chapter is thankful to all Faculties for taking interesting lectures. The Chapter is also thankful to other supporting member namely Er. PA Shah, Er. Urmila Shah etc., who helped a lot for management the workshop.

**Er. SM Godkhindi and Er DC Mehta along with Er. PA Shah are responsible for best programme management.**



**Visit to 400kV Kasor Substation of GETCO**

- On **25 & 26 Feb 2017**, the Chapter & CBI&P-New Delhi jointly organized a **2-Day Seminar on "Electric Motors & Controls"** at Vasvik Auditorium, the IE(I), Vadodara. The report of the event is brought out in this issue seperately.
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## OBITUARY



**Er. Mahendra M Nayak** the Founder member-cum-Joint Secretary of Vadodara Chapter left for his heavenly abode on 09 Mar 2017. He had been active in the activities of SPE(I) in general and the Vadodara Chapter in particular since inception of the Chapter, till last day. He rendered his services as an Executive Committee member and an Advisory Committee member.

May God give peace to the departed soul.



**Er. Gajanan M Bahudhanye** passed away on 17 Mar 2017. He was an Advisory Committee member right from the day he became Life Member of SPE(I) Vadodara Chapter. Inspite of his good professional and technical back ground, he was down to earth. He rendered selfless service to the Chapter till he breathed his last. In his death, the Chapter has lost a well-wisher and arch active member.

May God give peace to the departed soul.

# BRIEF REPORT ON THE SEMINAR ON “MOTORS & CONTROLS”

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The Vadodara chapter of SPE (I) organized a 2-Day seminar on “Electric Motors & Controls” in the Vasvik Auditorium of the Institution of Engineers, Vadodara, on 25-26 February 2017. 125 delegates hailing from academic institutions, industries, motor manufactures and consulting firms, attended the seminar.

The inaugural function was presided over by Er. SK Negi, Ex. MD, GETCO and All India President of SPE(I). Er. YV Joshi, President ERDA was the chief guest. Others who shared the dais included Er. Bharat Shah, Past President, All India Electric Motor Manufactures' Association and Proprietor, Polyphase Motors, Er. GV Akre, Chairman, SPE(I) Vadodara and Er. SM Takalkar, Vice-Chairman, SPE(I) Vadodara. Er. GV Akre welcomed the dignitaries, delegates and the guests. He briefed the gathering about the activities of SPE(I). After lighting of lamp and floral welcome to the dignitaries, Er. SM Takalkar gave information in brief regarding the seminar. Er. YV Joshi made a small presentation on various aspects of motors. Er. SK Negi was very happy that SPE(I), Vadodara Chapter has organized a seminar on a topic which is covering vast cross section of the electrical power utilization. He also stated that over a period of time, the design and control of motors have undergone radical changes. Er. DC Mehta, Joint Secretary of the chapter presented vote of thanks. After the inaugural function, technical sessions started. The details of presentations made by various learned speakers are briefed hereunder:

**1. Er. Bharat V Shah** – Past President, All India Electric Motor Manufactures' Association and Proprietor, Polyphase Motors- 702, GIDC, Makarpura, Vadodara.

**Topic:** Construction of Induction Motors, Standardization, Classification of Motors, Life Cycle costing and

special purpose motors, How the running cost of motors is considerably more important than the initial purchase cost was highlighted.

## **Special Purpose Motors :**

Machine Tools, Textile Machines, Ginning Motors, Stenter Motors, Warship, Submarine etc.

Case Study of highly populated 5 HP motors  
There was a Display of high speed (12,000 RPM) vibration free motors manufactured by M/s Polyphase Motors.

**2. Prof. Dr. Archana Nanoty** – Director, Technical Education, GSFC University.

**Topic:** Multiphase Motors – Design & Development

Brief of presentation:

- Current stresses in motors
- Comparison of torque with dual 3-phase and conventional 3-phase motors.
- High current applications like ship propulsion, aerospace, hybrid vehicles.
- Case study of 6-phase induction motors designed and tested at Mogar.

**3. Prof. Dr. Ketan P Badgajar** – HoD, Electrical department, Govt. Engg. College, Bhavnagar.

**Topic:** Condition Monitoring of Rotating Electrical Machines.

Brief of presentation:

- Understanding of construction, performance, failure mechanism, analysis of magnetic vibration, chemical signals, instrumentation etc. explained.
- Causes of faults in Frame, stator, Rotor, bearing, electrical connection etc. and

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remedies thereof.

- Regularly monitoring of Thermal, Chemical, Vibration.
- Electrical status of stator, rotor, turn to turn, signature analysis.

**4. Er. UK Jethwa** – V.P. (Electrical)  
Reliance Industries Ltd., Mumbai.

**Topic:** HT/LT Motors Maintenance in Large Industries

Brief of presentation:

- The bearing cooling done by wastage air can save energy.
- Improvement in air suction of 1.1 MW motor.
- Re-greasing on line
- Silver coating on machines.
- Role of Switch board reliability in motor performance.
- Current signature analysis.
- Different ways to reduce outages
- Condition monitoring
- Contamination of windings
- Aiming at zero failure of motor by various means

**5. Dr. DK Chaturvedi** – AGM, NTPC Ltd.  
Noida

**Topic:** Design Requirement of Motors for VFD Application and High Quality Motors

Brief of presentation:

- More insulation leads to failure
- Common causes of winding failure
- Clearances for air circulation
- Remedial measures like coil, winding and coil shaping machines.
- Test on motors such as Tan Delta Corona Imaging
- Design Requirement of motors from IGBT based VFD.

**6. Er. Vikas Jayvant** – Director, Energy Advice India

**Topic:** Selection Criteria for Motors & Energy Savings through Applications

Brief of presentation:

- Motor Characteristic
- Environmental factors affecting performance
- Power Supply condition
- Selection of motors

**7. Er. Pradeep Thakur** – Director, Energy Advice India

**Topic:** Condition Monitoring of Motors

Brief of presentation :

- Condition monitoring of motors
- Predictive maintenance strategy
- Power quality and power control
- On line and off line monitoring
- Thermal imaging
- Motor current signature
- Power analyzer data login

**8. Er. Bharat P Makwana** – M/s. Epoch Automation Pvt. Ltd.

**Topic:** Super Premium Rotating Electric Motors

Brief of presentation :

- Categories of energy efficient motors
- Stray losses and efficiency (IEC 60034)
- Challenges faced by Indian Industries
- Star rating by BEE based on % saving in consumption of power.
- Different types of losses in motors
- Stator/Rotor copper losses, Iron losses & Stray losses.
- New Technologies (LSPM, LSSR, LSPMA) in motors.
- Submersible motors.
- Performance comparisons of different types of motors.

**9. Er. Mohan R Tilwalli** – Proprietor, Gururaj Engineers





## **NATIONAL SEMINAR ON ELECTRIC MOTORS & CONTROLS**

2-Day National Seminar on "Electric Motors & Controls" was organized by the Chapter on 25 & 26 Feb 2017 at Vasvik Auditorium, Opp. GERI, Near Trident Circle, Race Course, Vadodara.  
(Registration in progress)



The seminar was inaugurated by Er. SK Negi, All India President of SPE(I) jointly with Chief Guest Er. YV Joshi, President- ERDA.

Er RN Purohit, the Member of Steering Committee from SPE(I), Vadodara Chapter briefed on the purpose and motto of this seminar.



Specific features of the Seminar were.....

Steering Committee of executives having rich experience from the Utilities, Manufacturers, Testing Laboratory and Consultants etc. was formed to achieve best output from the Seminar.



The Technical sessions of the Seminar were conducted by expert manufacturer of motors – Er. Bharat V Shah, Proprietor, Polyphase Motors, Makarpura, Vadodara.

Total 14 speakers were invited to deliver their lectures giving sufficient time slot.

The experts from academic.. Prof. Dr. Archana Nanoty & Prof. Dr. Ketan Badgujar gave information on Multiphase Motors & Condition Monitoring of Rotating Electrical Machines respectively.



The delegates expressing their views during concluding session.

The Vice Chairman of SPE(I), Vadodara – Er. SM Takalkar concluded the Seminar with vote of thanks.



Group Photograph of SPE (I) Engineers responsible for Successful Seminar.

The Chapter is also thankful to team of members namely ...

Er. SM Godkhindi,  
Er. VB Harani,  
Er. AR Shah,  
Er. NV Rede,  
Er. Urmila Shah etc.,

Er. DC Mehta,  
Er. MG Mehta,  
Er. RS Shah,  
Er. JK Surti,

Er. NG Yadav,  
Er. KN Rathod,  
Er. KK Bhatia,  
Er. AH Dhebar,

Er. NC Solanki,  
Er. PA Shah,  
Er. VB Kambad,  
Er. Keval Velani

who have given services behind the screen for event's success.



## WELCOME TO SPEAKERS .....



Er. Bharat V Shah - Proprietor,  
Polyphase Motors (L) by Er. SK Negi



Prof. Dr. Archana Nanoty – Director, Technical Education,  
GSFC University (R) by Er. Bharat V. Shah



Prof. Dr. Ketan P Badgujar – HoD, Engineering College,  
Bhavnagar (R) By Er. YV Joshi



Dr. SH Chetwani – ERDA (R) by Er. GV Akre



Er. UK Jethwa Reliance Industries Limited, Mumbai  
(R) by Er. Dr. BG Desai



Dr. DK Chaturvedi AGM, NTPC Ltd., Gurgaon (L)  
by Er. SM Takalkar



Er. Vikas Jayvant Energy Advice India (R)  
by Er. VB Harani



Er. Pradeep Thakur Energy Advice India (R)  
by Er. ND Makwana

## WELCOME TO SPEAKERS .....



Er. Bharat P Makwana M/s Epoch Automation P Ltd.  
(L) by Er. VB Kambad



Er. Ankit J Bhilkar – Larsen & Toubro, Mumbai  
(L) by Er. AR Shah



Er. NN Parekh – Electrical Safety Consultant  
(R) by Er. KN Rathod



Er. CG Ramatirth – Former Western Railway Engineer  
(L) by Er. KK Bhatia



Er. Mohan R Tilwalli Proprietor, Gururaj Engineers, Vadodara.  
(L) by Er. MG Mehta



Er. RP Sharma – Freelance Consultant-Vadodara  
(L) by Er. JK Surti



Dr. B.G. Desai – "Bhishma Pitamah" of Motor concluded the Technical Session.





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**Topic:** Variable speed Drives & Their Control Techniques.

Brief of presentation:

- Variable speed drive for DC motors and AC motors and control thereof
- Number of poles cannot be changed when running the motor, the speed can be change using VFD.
- VFD are not applicable to fix speed motors meant for steel rolling mills, conveyors, processing machines, form fill, crushers, pulverizes, ball mills, winders, centrifuges, traction, automobile, hoist, lift etc.
- The SCRs are used to change the speed in DC motors, it can be turned OFF and ON easily.
- The breakthrough can be achieved by IGBTs (Insulated Gate Bipolar Transistor) and MOSFETs (Metal Oxide Semiconductor Field Effect Transistor).
- VFD are based on frequency of the power. When frequency is reduced, the motor voltage is also reduced in same proportion and vis-a-vis.
- Motor details like voltage, frequency, rated current and speed is required to design the VFD.
- Building block for MV PWM Drives

**10. Er. NN Parekh** – Electrical Safety Consultant (Ex. Chief Engineer, IPCL, Vadodara)

**Topic:** Motors for Hazardous Area Application

Brief of presentation:

- Special enclosure is required for design of motor in hazardous area i.e. liquids, gases and vapors.
- Classified hazardous area are zone or division, gas group and temperature class.
- Zone or division are 0, 1, & 2.
- Gas group are 1. (Methane), 2A. (Acetone Ethyl family etc.), 2B. Ethylene, Butadiene etc.) & 2C.

(Hydrogen, Carbon etc.)

- Temperature classification are T1, T2, T3, T4, T5 & T6 having maximum surface temperature as 450°, 300°, 200°, 135°, 100° & 85°C.
- Procurement of motors and hardware.
- Integrity of IP equipment.
- Internationally accepted testing agencies.

**11. Dr. SH Chetwani** – ERDA

**Topic:** Energy Efficient Motors

Brief of presentation:

- Type of motors IE1, IE2, IE3, IE4 & IE5 as per IEC 60034
- Losses in the motor are copper, core, friction and windage.
- Design validation carried out on the basis of electromagnetic analysis & thermal analysis.
- IE4 class motor has optimum efficiency.

**12. Er. CG Ramtirth** – Former Divisional Engineer, Western Railway.

**Topic:** Electric Traction Motors

Brief of presentation:

- SLD of 25kV AC locomotive.
  - Traction power circuits
  - Primary boggies
  - Tap changer control circuit
  - Distinguish among locomotive, boggy and guard
  - AC & DC Locomotives.
  - Difference between passenger locomotives and freight locomotives.
  - Parts of locomotives like break assembly, loading pad, traction motor, gear box, wheel and axle.
  - Electrical parameters like Ammeter, OHE, Voltmeter on driving desk of 25 kV Locomotive.
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**13. Er. RP Sharma** – Freelance Consultant

**Topic:** Real Life Situation of Motors in Process Industries.

Brief of presentation:

- Importance of procurement of motor considering life cycle, cost, quality, efficiency and capacity.
- Application of various motors depending upon the use of motors.
- Automation & operation of motors.
- Working out ratings of motors.
- Maintenance, services of motors.
- Training to the staff
- Project execution methods

**14. Er. Ankit Bhilkar**, Asst. Manager, L&T Mumbai.

**Topic:** Industrial Automation

Brief of presentation:

- Classified application like torque, variable torque & load.
- Explained speed verses torque and speed verses load graphs.
- Operation of Hoist, extruder, reciprocating compressor, screw compressor, reactor, conveyors, roller, Jaw crusher etc.
- Variable torque application in centrifugal fan, ID/FD fan and pump.
- Power flow in motors including losses.
- Use of VFD – Soft starter, Soft Stop, Speed control, Torque control, Energy Saving & Power factor improvement, Quality & Productivity, Electronic Reversing.

**15. Er. PA Shah**- Practicing Electrical Engineer (Former Chief Engineer-GETCO)

**Topic:** Large Capacity Motors for Pumping Station

Brief of Paper: (The paper could not be presented for want of time)

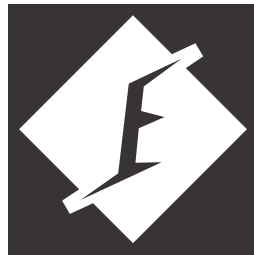
- Type of Starter – DOL, Star Delta and soft starter, application thereof.
- Function of pumping station.
- Pumping station in Gujarat
- Hydro power station and reversible operation of turbine generator to pump motor.
- Load requirement for pumping station, normally 2500kW to 5000kW for each pump.
- Component of pumping station are Large capacity motors, big pump, gear box, LT motors, auxiliary transformer, bus duct, DG set, battery & battery charger, HT/LT cables with accessories, lighting system, earthing system etc.
- Type of pump concrete volume (CV) and vertical turbine (VT)

The technical sessions were conducted by **Er. Bharat V Shah** (Proprietor, Polyphase motors). The anchoring of the inaugural session was done by **Er. RN Purohit**, Advisory Committee member SPE (I) Vadodara. **Er. PA Shah** assisted Er. Bharatbhai V Shah for conducting the question answers sessions after technical paper presentations.

The concluding session was chaired by **Dr. BG Desai**, an exponent in the field of Energy Efficiency. Dr. BG Desai summed up the technical sessions and gave his concluding remarks. In the end, the participants expressed their views on the total proceedings of the seminar.

All participants have taken active part in interactions with the author of the papers and also appreciated the seminar as far as technical contents & presentations by the authors including hospitality are concerned.

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From :*



**SHREEJI**  
**ELECTRICALS**

**SURAT**



# PROCEEDINGS OF ALL INDIA ANNUAL GENERAL MEETING OF SPE (I) ON 18 DEC 2016 AT VADODARA

The **All India AGM** of SPE (I) was held on **18 Dec 2016** at **Vadodara** in the auditorium of Gujarat Energy Training and Research Institute (GETRI), Gotri Road, Vadodara. **75** members (from Vadodara Chapter) attended the meeting. The following transpired during the meeting.

1. Due to lack of quorum at the schedule time of 10.00 hrs. the members present left the house and reassembled at the same place after 30 minutes and carried on the business of AGM.
2. **Er. SK Negi**, MD of Gujarat Energy Transmission Corporation (GETCO) and All India President of SPE (I), presided over the meeting.
3. **Er. SM Takalkar**, Vice-Chairman, SPE (I) Vadodara Chapter informed the house that due to unavoidable circumstances, the office bearers of SPE (I) HQ could not remain present. However, they have sent agenda points and audited accounts for the last financial year 2015-2016
4. **Er. SM Godkhindi**, Secretary, SPE(I) Vadodara Chapter on behalf of

Secretary, HQ read out the minutes of the last All India AGM held in Vadodara on 11-10-2014. The minutes were passed without any change.

5. **Er. SM Takalkar** gave information regarding the inception of SPE (I) before independence and number of chapters existing then and their present status. It was informed that Vadodara Chapter is the most active chapter with consistency in activities and high membership.
6. **Er. AN Makwana**, Treasurer, SPE(I) Vadodara Chapter presented the accounts of SPE (I), Central Office on behalf of the office bearers of SPE (I) HQ. The accounts were passed unanimously.
7. **Er. RN Purohit**, Life Member of Vadodara Chapter presented the amendment to the bye-laws of SPE (I) covering the **Life Membership for Institutions**. This amendment has already been approved by the AGM of Vadodara Chapter on 18 Sep 2016 and now it is put up for the approval of All India AGM

		Approved in SPE(I), Vadodara Chapter	Approved in All India AGM
Sr. No.	Category of Institute	Fees for Life time Membership	Fees for Life time Membership
1	Large Institutions	Rs. 50,000/-	Rs. 1,00,000/-
2	Medium Institutions	Rs. 25,000/-	Rs. 50,000/-
3	Small Institutions	Rs. 15,000/-	Rs. 25,000/-
4	Other Institutions (Including Academic)	Rs. 25,000/-	Rs. 15,000/-
5	Patron Member from Any of Institutions	Rs. 1,50,000/-	Rs. 2,00,000/-

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The amendments as above were approved by AGM

1. **Er. RN Purohit** also presented an amendment to by laws pertaining to procedure of election of committee members. These amendments were approved by the AGM of Vadodara Chapter held on 18 Sep 2016. The amendments were approved by the All India AGM unanimously. They are circulated through the **20<sup>th</sup> AGM Notice** of SPE(I) Vadodara Chapter.
  2. A New Bye-law of Honorary Fellow Membership and Merit Award was discussed and approved in Annual General Meeting of SPE (I), Vadodara Chapter on 18-09-2016. Er. RN Purohit presented this draft bye-law of SPE (I) of Honorary Fellow Membership and Merit Award. The bye-law copy is already circulated through the **20<sup>th</sup> AGM Notice** of SPE(I) Vadodara Chapter. This bye-law is approved in All India AGM unanimously.
  3. After the agenda as above, **Er. GV Akre**, Chairman, SPE (I) Vadodara Chapter invited open house discussions. The following is the brief of discussions/suggestions/proposals.
    - **Er. AR Shah** suggested that the Chapter should organize short term courses for Utilities and Industries. The HV testing equipment with the colleges/industries can be used for study and R & D.
    - **Er. Vrajesh Desai** suggested forming an Expert Technical Committee for conducting **seminars and technical activities and promoting R & D.**
    - **Er. DC Mehta** suggested that SPE (I) has a good pool of talent and therefore, we can invite problems/suggestions from members and others through website and provide solutions.
- **Er. KG Shah** offered his services for enhancement of website and documentation.
  - **Er. PA Shah** suggested that we should design lecture material as per the syllabus framed by different utilities.
  - **Er. Col. VJ Trivedi** suggested that SPE(I) should organize study visits to places like Load Dispatch Centre and learn about SCADA. The substation visit should include SCADA and GIS.
  - **Er. SM Takalkar** requested Er. SK Negi to organize a meeting of SPE(I) office bearers with the Ministers/Secretaries in Government of Gujarat for projecting and promoting SPE (I) Vadodara Chapter.
  - **Er. GV Akre** suggested that Government of Gujarat should engage SPE(I) Vadodara Chapter for Energy Audit. This should be made as a discussion point with the Power Minister. He further emphasized on extensive use of e-mail for all communication including suggestions, if any. He also mooted an idea of Digital Library.
  - **Er. AN Makwana** suggested that we should involve more and more students by giving them an opportunity to make presentation.
  - **Er. Paresh Doshi** from L&T-Vadodara suggested that SPE(I) should take help from GEDA for conducting programmes in colleges and industries. Er. SM Takalkar indicated that this is already being done.
  - **Er. JC Marathe** requested SPE(I) to organize lectures and awareness for Electrical Safety.
  - **Er. (Prof.) JD Wadhwa** suggested that discarded equipment like CB, CT, VT, Distribution transformers etc. from power utilities should be given

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to academic institutions for study by the students. He further suggested that for students after passing out, a six months' special course should be devised for better employability. This can be done with nominal fees.

λ **Er. (Prof.) Praful Chudasama** of SRICT-Ankleshwar suggested that SPE(I) should work like a bridge between Academy and Industry for the benefit of the students.

λ **Er. N. Dinker, Founder Chairman** of SPE (I) Vadodara Chapter, appreciated the working of SPE(I) Vadodara and stated that it is due to regularity in conducting monthly meeting, publication of quarterly NEWS LETTER and organizing monthly lectures and AGM. He also added that the Chapter has progressed so well because of the selfless services provided by the members of the Chapter. He mentioned the names of late Er. NN Jadhav and Er. SM Takalkar for their contribution.

λ **Er. SM Joshi** (presently residing in USA) wished that SPE(I) Vadodara Chapter must continue to grow and become more powerful and useful.

4. In his presidential address, **Er. SK Negi** emphasized on the following.

λ There should be thrust on Automation and Digitization.

λ The members and engineers should aim at adopting healthy and reliable system. Importance should be given to Human Safety particularly effective Earthing.

λ The forum should be launched to include engineers from IEEMA, CBIP, CEA, Equipment Manufacturers, FGI, Engineering Colleges, Consultants, Tata Power etc. The forum should organize meetings regularly not

exceeding a period of six months. This forum will prepare data sheets and provide solutions to the problems in Electrical Power Systems. The forum may also discuss and deliberate on use of latest technology like polymer insulators instead of porcelain, ester oil instead of mineral oil, use of vacuum interrupter instead of SF<sub>6</sub> etc.

λ SPE(I) should engage and involve engineering students to the maximum possible extent.

λ Feedback document regarding the benefit derived by the industry due to energy conservation, should be obtained for taking forward the aim of BEE. Out of the members of committee of SPE(I), 4 members should be selected to work on the issues related to industries and utilities.

λ Major industries and utilities should be requested to spare the services of senior officers for delivering the lectures on various topics.

The meeting ended with a vote of thanks by **Er. DC Mehta**, Joint Secretary, SPE(I), Vadodara Chapter.

**Er. RN Purohit** anchored the entire AGM session.

## Count Your Blessings

Count your blessings instead of your crosses;  
Count your gains instead of your losses.  
Count your joys instead of your woes;  
Count your friends instead of your foes.  
Count your smiles instead of your tears;  
Count your courage instead of your fears.  
Count your full years instead of your lean;  
Count your kind deeds instead of your mean.  
Count your health instead of your wealth;  
Love your neighbour as much as yourself.

**Er. NR Joshi**

Asst. Prof.

Electrical Engineering College, Nashik



# Mathematics of Road Travel Safety

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During last decade, car usage has increased multifold. Earlier, car was considered as luxury and it was within the reach of aristocrats only. But now the picture has changed due to better average earning that permit to have own car. On the other side, many international brands have ventured in small car production with variety of models at competitive price. Also vehicle loan is available very easily at liberal terms and competitive interest rates.

Also public transport is lacking in reliability, regularity, courtesy, comfort and cleanliness. Due to absence of responsible management, many a times this is putting travellers in embarrassing position. Ultimately there is drift from public transport to private vehicles. Hence, heavy vehicle traffic is on the roads. The speed of the car on highway is around 120 kM per Hour.

Most of the persons driving car have over confidence about their driving skill and alertness. It seems they are ignorant of the risk involved in high speed driving in undisciplined traffic. Ultimately they cannot control the vehicle during actual unexpected event and disaster takes place.

Here is some simple calculation that may highlight the issue and may notify the risk and help in careful driving.

Speed of 120 kM per hour = 2 kM per minute = 2000 meters per minute

=  $2000 / 60$  meters per second =  $2000/60 \times 3.281$  Ft. per second = 109 Ft. per second.

This means vehicle is advancing 109 Ft. per second.

As a power engineer, we analyze time for each steps of fault clearance, starting from occurrence of fault till arc quenching, following the breaker operation. This is required for relay setting and coordination.

Road driving emergency steps may include, creation of image on retina, convert to signals, transmit to picture recognizing zone in brain that interprets picture & sequence

and the information is passed on to central nerve system. Received data is processed by comparing relevant history and course of action is decided and directives are given to action centre of brain, from where order is sent to concerned organ of body (hand or foot) and finally organ acts to turn steering or presses the brake lever.

High speed driving has no adverse effect in normal straight disciplined traffic. But during emergency, it turns to havoc, particularly when sudden obstacle comes on the way due to human, animal or vehicle crossing, object falling from vehicle ahead, parked vehicle due to emergency or accident etc. Under such condition there are two options.

## (1) Stop the vehicle

It is established that it takes 1.6 seconds to react for any event with stable mind and full concentration. By this time, vehicle moves  $1.6 \times 109 = 174$  Ft. So breaking starts after 174 Ft., then slowing down and stops. So total travel may be about 200 Ft. before stop. So gap of more than 200 Ft. is required for safety. If gap is less and breaking is soft, vehicle may have collision. Whereas hard breaking causes travellers' collision with front seat or dashboard. The vehicle may overturn as well.

## (2) Turn the vehicle.

In emergency, steering turn may be between 30 to 60°. With steering rotation of 15, wheel turning may be 2 to 4° (consider average 3° wheel turn).

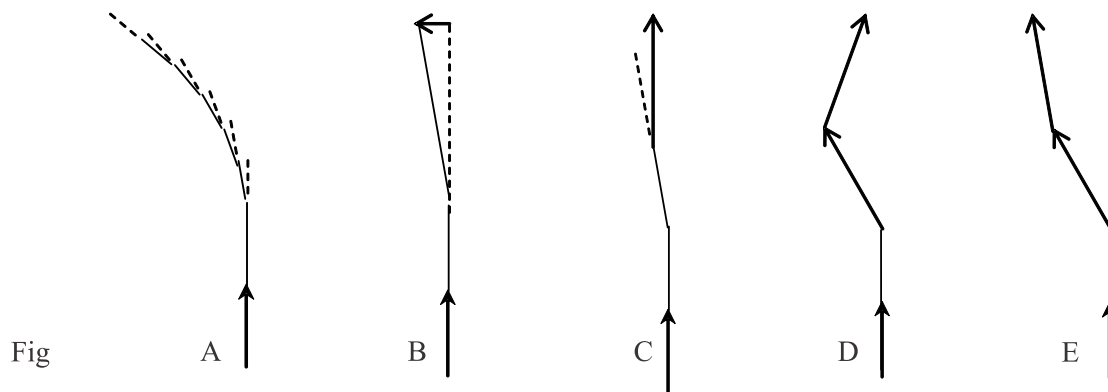
- A. Steering remains turned. Here vehicle turning is continuous but assume 3° turn at every foot. Then say by 30 Ft. travel turning may be  $30^\circ \times 3 = 90^\circ$  degree and vehicle may be off the road within  $30/109 = 0.3$  seconds. (Fig A)
- B. Steering turned back to normal immediately. Consider this occurs in 0.05 seconds. By this time vehicle advances  $109 \times 0.05 = 5.5$  Ft. and turning will be  $5.5 \times 3 = 16.5^\circ$ .  $\sin(16.5) = 0.28$ . Every second vehicle

moves side wise by  $109 \times 0.28 = 30$  feet. Vehicle may be off the road before 2 seconds. (Fig B)

- C. Track change by turn left side, turn right side and straight. Vehicle requires side wise shift of about 7 Ft. So reverse turning by equal angle should be for 0.24 seconds only and then straight

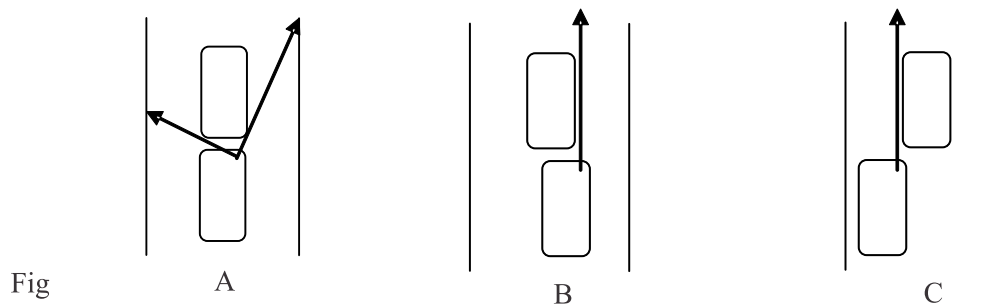
after 0.05 seconds, as in (Fig C)

- D. For safe track change, turning angle and its duration is the criteria. In case turning angle and / or duration is not as required in C above, it may move as in Fig D or Fig E and ultimately go off the road.



#### (1) Over take

Over taking vehicle increases the speed but it may be on average 5km/H higher than the vehicle being over taken. To take vehicle from safe distance back to safe distance ahead, needs to overrun by  $200 + 200 = 400$  Ft. This takes about 89 seconds with this speed difference. During this 89 seconds, vehicle travels by  $89 \times 109 = 9690$  Ft. Hence to start over taking, this length of side track should be clear. On turning of road, 9690 feet length is not visible. Therefore, it is not advisable to overtake.



Driver seat is on right side of the vehicle so he/she has long view on right track where as very short view on left track, as in the figure A. When one fourth of the vehicle is taken towards right track, full track is visible as in Fig B. But left side full track is visible only when vehicle is fully taken on left track as in Fig C. Therefore over taking from right side is advisable.

Our roads are subject to any eventuality like humans, animals and vehicles roaming on the road, vehicle halt, park and repair on road. Dark colored vehicles without brake light, back light and reflectors. Zigzag drive (frequent track change), slow driving on high speed track, cross the road in haste without due care, etc.

It is, therefore, important that one selects the speed based on destination reaching time and emergency treating time. If above averment is studied properly by all the drivers, the accident may be reduced drastically. Truly speaking R.T.O. Authorities can educate the aspiring Driving Licence seekers.

**N.D.Makwana**

# LIST OF ENROLLED MEMBERS FOR THE YEAR 2016 – 17.

In our last News Letters of July-16 & October-16, the list of NEW MEMBERS was incomplete; hence the complete list of NEW MEMBERS from April, 2016 to March, 2017 is repeated here:

Month	Membership No	Full Name	Membership Category
Apr-2016	2228	Dave Pratikkumar J	Student Member
	2229	Patel Radheshkumar V	Student Member
	2230	Patel Pratik A	Associate Member
	2231	Vaishnav Ramin R	Student Member
	2232	Raghav Rajat	Student Member
	2233	Modha Paresh R	Associate Member
May-2016	2234	Mistry Rushil P	Associate Member
	2235	Prajapati Ramesh D	Associate Member
	2236	Khalasi Dipeshkumar B	Associate Member
	2237	Soni Neel S	Associate Member
	2238	Mochi Pratik K	Associate Member
	2239	Chauhan Niravkumar A	Associate Member
	2240	Chharchhoda Mufaddal H	Student Member
Jun-2016	2241	Shah Aakash M	Associate Member
	2242	Solanki Mitesh P	Associate Member
	2243	Joshi Varsha R	Life Member
	2244	Rupareliya Hardik V	Member
	2245	Rathod Nitinbhai J	Life Member
	2246	Patel Ramesh C	Life Member
	2247	Desai Hrishikesh R	Member
	2248	Patil Mayur G	Associate Member
	2249	Zavare Khushbu R	Associate Member
	2250	Saswadkar Pratik V	Associate Member
	2251	Chauhan Bhadresh B	Life Member
Jul-2016	2252	Kamble Sharad M	Life Member
	2253	Takalkar Shashank S	Associate Member
	2255	Joshi Kedar U	Student Member
	2256	Ainapure Hardik P	Student Member
	2257	Suthar Kishan B	Student Member
	2258	Prajapati Mrugesh K	Student Member
	2259	Kachhiya Dhruv M	Student Member
	2260	Patel Parth M	Student Member
	2261	Shah Smit N	Student Member
	2262	Patel Yash M	Student Member
	2263	Parikh Raj S	Student Member
	2264	Kotecha Ravi H	Student Member
	2265	Kavaiya Dharam R	Student Member
	2266	Thekdi Kunj K	Student Member
	2267	Shah Umila H	Member
Aug-2016	2268	Goswami Aniket M	Student Member

Month	Membership No	Full Name	Membership Category
Sep-2016	2269	Shah Dhairya S	Student Member
	2270	Nikhade Kedar P	Student Member
	2271	Panchal Vaibhav B	Student Member
	2272	Danani Rahul D	Student Member
	2273	Parmar Nirmal R	Student Member
	2274	Patel Meet A	Student Member
	2275	Pandya Parth J	Student Member
Oct-2016	2276	Mehta Gaurang M	Associate Member
	2277	Manoj Kumar	Life Member
Nov-2016	2278	Makwana Deep K	Life Member
	--	--	--
Dec-2016	2279	Rajpura Natvarlal H	Life Member
Jan-2017	2280	Chudasama Praful P	Life Member
	2281	Sutaria Hasmukhbhai R	Life Member
Feb-2017	2282	Bhatt Madhukar V	Life Member
	2283	Dabla Harshad M	Life Member
	2284	Velani Keval N	Life Member
Mar-2017	2285	Bharuchwala Kiran P	Life Member
	2286	Agashe Satej P	Life Member
	2287	Gohel Hiteshkumar M	Life Member

## SUMMARY OF ENROLLED MEMBERSHIP DURING 2016-17:

Members	05
Student Members	28
Associate Members	18
Life Members	15
TOTAL	66

**Note:** All Members, Associate Members as well as Student Members of 2016 –17 are requested to renew their membership for the year 2017-18.



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**Website:** [www.iecindia.co.in](http://www.iecindia.co.in)



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The proposed institute will have a complete infrastructure and facilities for imparting training (Theory & Practical) in various fields as mentioned under:

**1) Training Centre**

- a) Training and skill development under - VTP Scheme, approved by The Director of Employment and Training, Government of Gujarat.
- b) Crane Operator training for Various types of cranes on imported Desktop Simulator (USA Made).

**2) Service Centre**

- a) Service Centre for instrument repair, testing and calibration as per ISO & NABL requirement.
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- c) Inspection, testing and certification of
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**3) Authorized Training Centre (ATC) ROOF TOP SOLAR PLANTS.**

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## GLIMPSES OF NATIONAL AGM OF SPE (I)



Unveiling of Souvenir by Er. SK Negi (R),  
National President



Felicitation of Er. SK Negi, National President  
by presenting a memento



Er. SK Negi, National  
President addressing AGM



Er. GV Akre, Chairman  
addressing AGM



Er. SM Takalkar, Vice-  
chairman addressing AGM



Er. SM Godkhindi, Secretary  
presenting his report



Er. N Dinker, Founder Chairman of SPE(I)  
Vadodara Chapter, expressing his views



August gathering during National AGM of SPE(I)

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