

SPE NEWS LETTER

APRIL, 2019 | Issue No. 2/2019



THE SOCIETY OF POWER ENGINEERS (INDIA)

Vadodara Chapter (Estd. 1996)

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Mission Shakti

इसरो ISRO



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NEW MEMBERS ENROLLED BETWEEN APR-2018 & MAR-2019

GR No.	NAME	Membership Grade
2320	Mehta Maulin A	Life Member
2321	Prajapati Hetalkumari B	Life Member
2322	Badheka Jatan S	Life Member
2323	Suthar Nilesh K	Life Member
2324	Panchal Ghanshyam C	Life Member
2325	Sheth Kamleshbhai B	Life Member
2326	Parmar Devendrasinh B	Member
2327	Sharma Shivani P	Life Member
2328	Verma Ramashankar M	Life Member
2329	Shukla Nilesh J	Hon. Life Fellow
2330	Gohil Bharatkumar P	Life Member
2331	Kumar Anil	Life Member
2332	Ranade Manasi M	Life Member
2333	Nanoty (Dr.) Archana S	Life Member



Very recently Nitti Aayog has stated that present installed capacity of power generation in India has increased to 344 GW and it's energy deficit has shrunken to 1% in 2018 which was around 4% in 2014. India now ranks 26th in the World

Bank's "Ease of Getting Electricity index" which was 99th rank in 2014. Aayog has also stated that in new and renewable energy sector, cumulative installed capacity has nearly doubled from 35.5 GW in 2014 to about 70GW in 2018 (76.87 by February 2019). In solar energy sector the installed capacity is increased from 2.6GW to 22GW in the same period. An expert group has been set up by the NITI Aayog to assess the achievement of the first milestone of 175GW RE by 2022. It has expressed confidence that India is on track to achieve this target.

Even though the installed electricity generation capacity is significantly higher than the peak demand of 162GW (January 2019), the country faces shortage of power in some of the states. The analysts and experts feel that this shortage is due to reluctance of DISCOMS in purchasing the power from generation companies which demand high price for energy produced, mostly by conventional energy sources. Some of the reasons for high prices are shortage of coal and unregulated price of imported coal, high transmission and distribution losses and inadequate infrastructure.

Large population of our country still do not have electricity at their homes. Also, it is estimated that demand will increase more than double in 2022 compared to level in 2012. The government cannot rely on conventional source of energy alone and must increase sources from renewable energy. It is keen in solving this problem by generating the electricity by low cost, non-conventional sources of energies like wind, solar, biomass, small hydro etc.

India's achievable potential for Solar and Wind is 479GW and 410GW respectively as reported in 2015. To achieve this level the government will be providing broad policy parameters, frameworks

and budgetary provisions while industry needs to act and support this growth by public-private partnership. The government has also launched some schemes like installing one lac solar pumps, solar panels on water bodies (thus reducing evaporation losses), solar roof-tops, waste to energy plants, sustainable electric vehicle (EV), hydrogen energy and fuel cells etc.

Distribution companies receive majority of their requirement of power from different generating stations in the country, by using convenient methods to harness the most economic source of energy. With increase in renewable energy, DISCOMS will have option for utilizing this cheaper power to optimize the cost of energy they buy. India is seriously working proactively on scheduling and dispatch of generation resource in the country by optimizing inter-state generating stations. CERC and POSOCO have launched the pilot program for implementing this scheme which is one of the steps taken to ensure uninterrupted power at reasonable price available to distribution companies.

The government has focused on sustainable growth in order to make the country energy-efficient within a specified time period. Individual can contribute to this growth by understanding and accepting these massive changes and using energy conservation practices and installing rooftop Solar plants for their energy needs at homes and offices. Society of Power Engineers (I), Vadodara Chapter had organized and continue to organize many seminars and conference to spread the awareness in development in RE sector. This is a contribution of SPE(I) Vadodara in the Power Sector of the Country.

Thanking you,

G V Akre
Chairman





Dear Reader,

According to India Infrastructure Research, the total coal-based installed capacity stood at 197GW as of March 2018, accounting for about 58% of the installed capacity of 344GW across all sources of power generation. While, the share of coal-based capacity in total capacity has increased consistently between 2013 and 2015, it has continued to decline marginally since then. According to India Infrastructure Research, the average year-on-year growth rate of power generated by coal-based power plants during 2012-16 was 9.3%.

Meanwhile, in 2016-17, electricity generation from coal-based plants accounted for more than 80% of the total power produced during the year. Private sector (IPPs and utilities) had the highest share in coal-based generation, followed by the central and state sectors. Between 2012-13 and 2016-17, generation from coal-based power plants has increased at a CAGR of 8.1%. In 2017-18, coal-based generation until was around 951BUs, maintaining the 80% share of the total power generation.

The plant load factor (PLF) for coal-based power plants has declined considerably from about 70% in 2012-13 to 59% in 2017-18, and is set to decrease even further. Rapidly changing generation mix will require coal-based power plants to be more flexible through multiple

physical changes. Moreover, the operational strategy of power plants will need to be changed in order to deal with the challenges posed by flexibilisation.

By 2022, renewables are expected to account for 33% of the country's power generation, and 43% by 2027. The future load generation scenario suggests a heavy demand growth, likely to be fulfilled in part by renewable sources of energy. However, given the intermittent and variable nature of these sources, the role of load balancing will be significantly played by coal-based and hydropower plants.

The installed coal-based power capacity is expected to reach 248,513MW by 2026-27, as per CEA's National Electricity Plan. An additional capacity of 51,342MW is under-development and likely to yield benefits by 2021-22. Major changes are expected in the country's installed capacity mix going forward. The share of coal-based power capacity in total installed capacity is expected to stand at about 48% by 2021-22 as against 57.3% in 2017-18. It is further expected to reduce to 39% by 2026-27.

We will be extremely happy to receive your views, opinions and suggestions. Please feel free to reach out to us.

Happy Reading!

(AWADHESH KUMAR SINGH)

CHAPTER'S ACTIVITIES



On **21 Jan 2019**, Chapter organized a joint lecture programme with IE(I) Vadodara in the Vasvik Auditorium of IE(I), Vadodara Local Centre. The topic was "**Solar KisanYojna**". Speaker was **Er. RB Patel**, SE, GUVNL-Gandhinagar. The speaker presented the details of new

schemes introduced to make solar power generation in the agriculture field more practicable. Since the farmer will be able to sell surplus power to DISCOM, he will use only required quantity of water. This will help in reducing water consumption from the bores.He

demonstrated with the help of facts and figures the advantages of the scheme including pay back, loan facilities and metering. He stated that the scheme is being implemented on trial basis on some feeders. After its success, it will be extended to entire state. After the initial trial, some changes are also possible in structure of scheme. The lecture was well received and attracted lot of interaction.

◆ On **20 Feb 2019**, Chapter organized a joint lecture programme with IE(I) Vadodara in the Vasvik Auditorium of IE(I), Vadodara Local Centre. The topic was "**Premature Failure of Transformers - Causes and Preventive**

Measures". Speaker was **Shri P Ramachandran**, Technical Advisor, ABB – Vadodara. The speaker elaborated on large number of parameters which leads to the premature failure of transformer. They include manufacturer, transportation, installation and maintenance. Lack of predictive and preventive maintenance is also responsible for failures. The lecturer presented smallest details of manufacturing process, design aspects as well as testing aspects. The lecture was well received which was evident from the Q&A during the whole lecture session.

◆ On **27 Feb 2019**, Chapter organized **1-Day Seminar on "Maintenance of Electrical & Mechanical Equipment in Industries and Utilities"** at Engineering Association Building, Bhakti Nagar Industrial Estate, Rajkot. The Seminar was attended by about 90 delegates from Industries and Academic institutions. A short report on the same is brought out in this issue.

◆ On **22 Mar 2019**, Chapter organized a joint lecture programme with IE(I) Vadodara in the Vasvik Auditorium of IE(I), Vadodara Local Centre. The topic was **"Information Security aspects in Technology" and "Data Privacy in Digital Economy"**. Speaker was **Er. Advait S Lele**, from Infosys Ltd.-Pune. He is a son of Er. SB Lele Life Member and former Vice-Chairman SPE(I) Vadodara.



The speaker elaborated on the following issues related to information security and Data Privacy. The presentation revolved round the following.

The topic of Information Security aspects in

technology covered the following (i) what is information breach? (ii) ways of information breach in today's digital world (iii) cost of information breach for organizations (iv) safeguards available. In essence, what is personal information, like name and other identifiers like Aadhar, PAN no etc. and sensitive corporate information for organizations like business data, trade secrets etc. and how it can be misused, and ways to protect in digital age. How information security plays critical role for service providers and customers.

The topic of Data Privacy in Digital economy covered the following (i) what is Data Privacy (ii) importance in today's global digital economy (iii) cost of privacy breach and Govt. regulations (iv) awareness within corporate community, employees and data users / data subjects. In essence, when all our personal information is available online, by way of mobile apps like Paytm etc., internet banking, as well as permissions we give while downloading any app, do we realize how we share our privacy with unknown people and organizations? Any breach of that personal information can prove costly to us - as small as nagging phone calls to sell card, to fraudulent transactions in the bank account. Do we know what data privacy means? Do we know as individuals and corporate entities how can we protect personal information? E.g. any electricity utility collects wealth of personal information from name and age to address, gender, payment history, as well as banking details of its customers. The lecture received very good response from young and old members alike.



Before the presentation of Er. Advait started, there was a formal ceremony to launch the publication of book written by Er. SB Lele, who is a Life Member of SPE(I) Vadodara Chapter and the former Vice-Chairman of the Chapter (now re-located in Pune). The book is titled **"Relocation of World's Population"**

Er. Lele briefed the members regarding the theme and contents of his book

A **1-Day Seminar** on the topic of **Maintenance of Electrical and Mechanical Equipment** was organized at Rajkot on 27 Feb 2019. The venue was the Auditorium of Rajkot Engineering Association. The aim of the seminar was to bring the Industry and Academy on the same platform.

During the inaugural session, **Shri AN Chandramouli**, VP, M/s Echjay Industries-Rajkot, **Er. SS Patel**, Chief Engineer, GSECL, Sikka TPS, **Er. GV Akre**, Chairman-SPE(I) Vadodara, **Er. Jaimin Gandhi**, Chief Engineer, PGVCL-Rajkot, **Shri Hemant Madeka**, Director, M/s Rolex Rings-Rajkot, **Er. JT Baxi**, Life Member-SPE(I) Vadodara and local coordinator, Rajkot, **Er. SM Takalkar**, Vice-Chairman-SPE(I) Vadodara were on dais. Er. Akre gave welcome speech and Er. SM Takalkar presented vote of thanks. The other dignitaries on dais also spoke and highly praised SPE(I) Vadodara for bringing such an event to Rajkot.

95 delegates from Industry, Academy, GETCO and GSECL attended the seminar. **M/s Rolex Rings** and **M/s Echjay Industries** sponsored the event. Co-sponsor for the event was **M/s Jyoti CNC Automation** while **M/s Prashant Castings** and **M/s Radhe Group of Energy** were the supporters.

The detail of lectures during the seminar is as

under:

Lecture Timing	Speaker	Topic
10.00 to 10.45	Er. SM Takalkar	Industrial Electrification
10.45 to 11.30	Dr.(Prof.) Jignasa Mehta	Maintenance of Mechanical Equipment in Industries
11.30 to 12.15	Er. PA Shah	Hydro Power Plant: Hydro Mechanical - Electrical Equipment
13.15 to 14.00	Er. JT Baxi	Case Studies of Energy Audit in Industries
14.00 to 14.15	Er. Ambani	Introduction to Thermal Power Plant
15.00 to 15.45	Er. Vrajesh Desai	Maintenance of Instrument Transformers
15.45 to 16.15	Er. A Natrajan	Room Temperature Vulcanizing (RTV), High Voltage Insulation Coating
16.15 to 17.00	Er. PA Shah	Maintenance of Motor, Compressor, Fan, Pump etc.

Er. Keval Velani, Executive Member, SPE(I) Vadodara had organized Audio-Visuals. **Er. JT Baxi**, Retd. CE, GETCO and a Life Member of SPE(I) Vadodara was the main coordinator in Rajkot for the seminar. He has a lion's share in organizing the event at Rajkot.

Er. KN Rathod, Advisory Member, **Er. NC Solanki**, Executive Member and **Er. VB Kambad**, Advisory Committee Member provided logistic support. Anchoring was done by **Er. PA Shah**, Advisory Member.

Simple Method to Check Fault in 3-Phase Squirrel Cage Induction Motor with Test Lamp only.

Rotor has no winding but has conductor bars connected to end rings at both ends. So, there is rare possibility of fault due to sturdy structure. Any damage is detectable on inspection.

Stator has winding containing numbers of coils placed in different slots of core. Ultimately these coils are interconnected to form three groups. Six ends of these three groups are brought out in terminal box marked as A_1-A_2 , B_1-B_2 and C_1-C_2 .

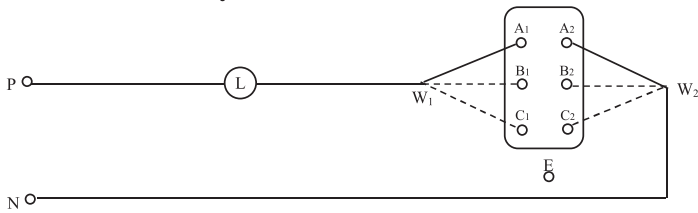
Fault may be of insulation failure due to high voltage or voltage surge. It may also be due to over heating from over load resulting in damage to insulation or melt and break of winding. Sometime polluted environment may corrode the insulation. In rare case there may be mechanical damage to winding during service and

maintenance. Insulation damage may result in partial/full winding short circuited, two phase winding shorted or winding to ground leakage. Melting/burning of conductor results in open circuit. So, for fault, these possibilities have to be checked.

Before start of testing, all supply connections to terminal and earth connection on body have to be removed.

Loss is wastage of energy reducing net useful energy for work at output. More loss reduces the efficiency hence uneconomical. It is the task to manage heat dissipation at appropriate rate else temperature may rise resulting in damage to machine or equipment. Machine capacity is related to safe temperature rise criteria.

Part-1 Continuity Test



One wire from phase through lamp W_1 and other from neutral W_2 are connected to terminals A_1 - A_2 .

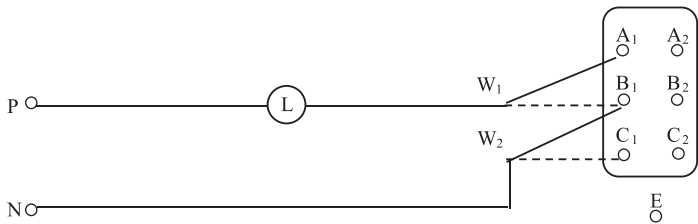
If lamp glows in this condition, this circuit is through, else circuit is broken.

Repeat same way with other pairs of terminals B_1 - B_2 and C_1 - C_2 .

Part-2 Short Circuit Test

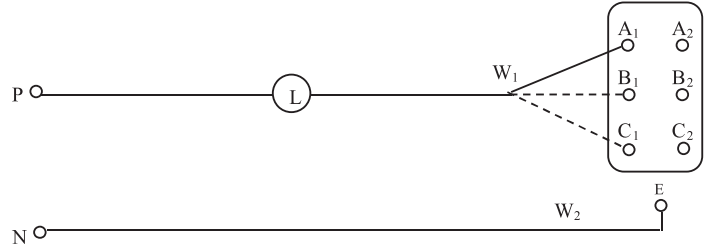
Observe brightness of glowing lamp in above three cases. More brightness in any case compared to other cases indicates short circuit in that group of coils. This means part of the winding in the group is bypassed by inter turn short circuit due to insulation damage. Equal brightness in all the three cases indicates no such fault.

Part-3 Between Groups (phase) Short Circuit Test



Test wires W_1 and W_2 are connected to pair of terminals A_1 - B_1 . In this condition glowing of lamp indicates short circuit between pair of coil groups i.e. short circuit between phases. Repeat the same way with other pairs of terminals A_1 - C_1 and B_1 - C_1 .

Part 4. Earth Fault Test



Test wire W_1 is connected to terminal A_1 and W_2 to earth terminal E on the body. In this condition glowing of lamp indicates phase to body (ground) fault. Repeat in the same way with wire W_1 to B_1 and W_2 at E . Finally wire W_1 to C_1 while W_2 remains at E .

In this way all possible faulty condition can be checked with test lamp. Experienced person can estimate extent of fault level based on intensity of lamp glow under different conditions. The tests can help in averting a major damage to the motors.

Er. ND Makwana
LM, SPE(I)

ENGINEERING QUIZ

What happens when neutral connection is broken as under?

Case 1 As in Fig.-1 between transformer and earthing

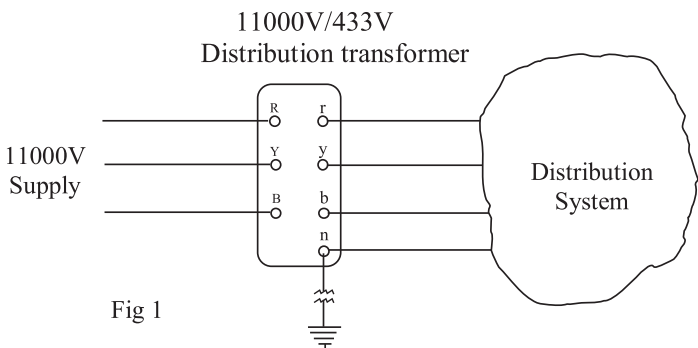


Fig 1

Case 2 As in Fig.-2 between transformer and distribution system.

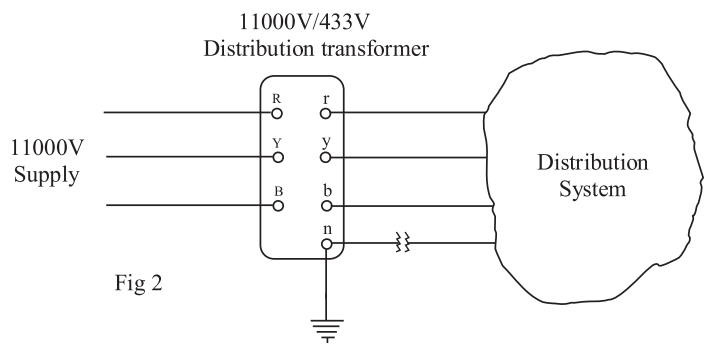


Fig 2

Er. ND Makwana
LM, SPE(I)

Conseil International Des Grands Reseaux Electriques (CIGRE) which mean in English as “International Council on Large Electric Systems” is having its HQ at Palais des congres in Paris (FRANCE). Every alternate year, in the month of August CIGRE organizes Exhibition and International Conference for five days. To attend this event is like going to a pilgrimage for every Electrical Engineer. Er. SM Takalkar attended the event in Paris in last August with his spouse. The brief about CIGRE conference is as under.

The inaugural ceremony was held on 26th August 2018 at 16.00 hrs. in the Grand Amphitheatre. The hall has a capacity of 3000 seats with a very big stage.

The function started on dot. There was an opening speech by the President CIGRE which was followed by a wonderful keynote speech by Mrs. Audrey Zibelman, CEO, Australian Energy market operator. She spoke on Future Electricity Market. The hall was full to its capacity with the presence of delegates, accompanying person (spouse etc.) and invitees. The inaugural function was followed by welcome drink in the lounge of the venue. As a matter of fact, the venue and the HQ of CIGRE is a very big premises which has shopping mall on the ground floor, Theaters & conference halls on the 1st floor and space for exhibition on 2nd floor and 3rd floor. More than 3000 delegates, accompanying persons and exhibitors participated in the conference.

In addition to Grand Amphi theatre, there are three more conference halls or theaters named “Havane”, “Bordeaux” and “Bleu”. They are also very spacious having a capacity of 1000 to 1500 seats each.

After the opening ceremony on 26th August, there were parallel technical sessions on different topics in all the four seminar halls named above. They included workshops and technical presentations. There were some poster sessions also. There were large number exhibition stalls which included manufacturing Giants like ABB, Siemens, GE etc. and Service providers who participated in the exhibition.

There were about 200 delegates to this conference from India. CBI & P had organized a special dinner on fourth day i.e. on 29-8-18 in the hotel Hayat Regency nearby the CIGRE venue.

The delegates and their spouse / accompanying person were invited for the dinner which was with varieties of Indian food.

CIGRE had also organized a cruise (boat ride) in the river Seine on one evening. This was with family on first come first served basis. The 2-hour cruise was full of enjoyment as the ride covered major monuments of Paris. There was free drink & bites in the Cruise.

There was a special Dinner organized by the president of CIGRE for all the delegates & their spouse at **cite de la monde at du design**. Of course, there was very little which the Indian delegates could eat but venue of the dinner and the gathering was impressive with the river sein flowing in the background.

The presentations in different auditoriums / theaters comprised Generation, Trans-mission, Distribution, Energy markets, Drives, Power Electronics, Sub-Stations SCADA etc. Each presenter was given only Four minutes. It was indeed surprising to see that 4 minutes presentation covered the entire theme. The time schedule was maintained meticulously. For questions, best audio system was available in each auditorium. Large number of volunteers, security personnel and the office bearers of CIGRE were available for assistance within hall and at all the places of the venue. Entry was restricted to only bonafide participants. Free transport from Airport of Paris to the venue & back was made available by the organizers.

In short, the CIGRE Bi-annual conference is worth attending at least once in life for the power/electrical engineers.

The Brief or the activities of CIGRE is given here under.

CIGRE was founded in 1921 at Paris with the aim to provide platform to various stake holders in the large power system for mutual benefit. It has 14,000 members as on the date from 100 countries. It has a worldwide network of experts from Generation, Transmission, Distribution companies and system operators as well as ministries, regulators, manufacturers, academicians and consultants. CIGRE is focused on practical aspects of power system.

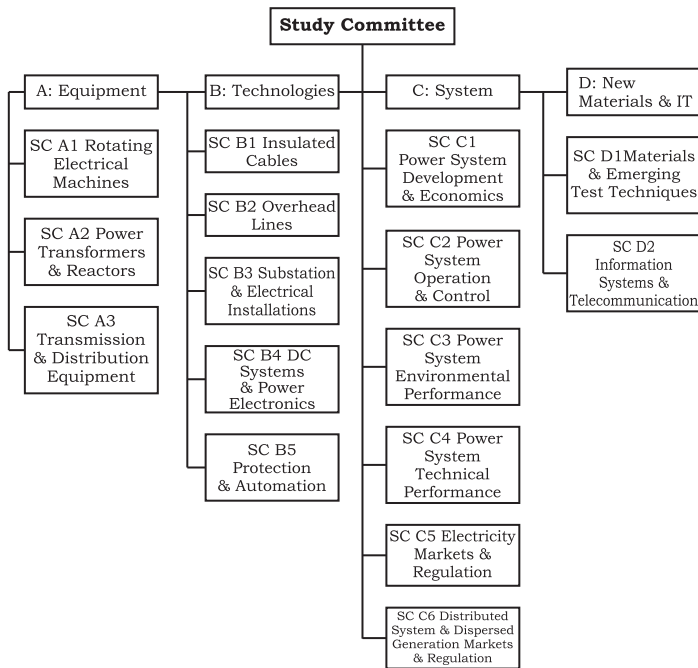
As an important benefit, CIGRE members are

provided free online access to 9,000 valuable technical publications based on the studies carried out by experts all over the world. CIGRE also publishes journal named “Electra” which contains lot of information in the form of technical brochures, papers of technical sessions etc.

As stated above, CIGRE organizes international conference every two year in Paris. Next conference will be in August end 2020. In addition to it, CIGRE also organizes symposia at various locations during the intervening period. There is a discount to the members in the Registration fee.

CIGRE has 16 study committees, each with multiple working groups. It carries out and encourages international studies. The 16 study committees comprise 24 members from different countries. 240 working groups produce 40 to 50 technical brochures per year. The 16 study committees are as under

4 Group of CIGRE Study Committees



CIGRE-India has been a member of CIGRE-Paris since 1949 and member of Administrative Council since 1970. CIGRE-India coordinates all the activities of CIGRE-Paris and organizes similar events in India which includes membership drive, training, dissemination of knowledge etc. There are 850 members of CIGRE in India. CBI&P is planning to take this figure to 1,500 in this year of 2019.

The benefits of joining CIGRE Activities are as follows:

- ◆ Access to more than 9,000 CIGRE Technical Reports
- ◆ Bimonthly journal “Electra” is given free of cost
- ◆ Opportunity to participate & present papers at CIGRE Sessions held at Paris at discounted registration fee.
- ◆ Opportunity to participate in CIGRE Working Group and Study Committees
- ◆ Opportunity to become part of Worldwide network of experts which benefits an individual and organization



Er. SM Takalkar (Second from left), Er. VK Kanjlia, Secretary, CBIP (Extreme Left) and Er. PP Wahi, Director, CBIP (Centre) at the Registration Counter at CIGRE Conference Paris

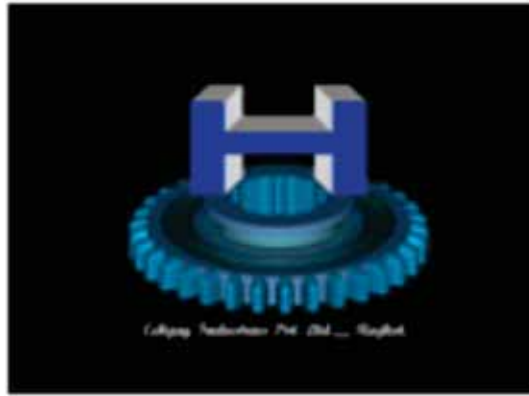


Er. SM Takalkar, Vice-Chairman of SPE(1), Vadodara and Mrs. Purnima S Takalkar attending the Inaugural Session of CIGRE Conference in Paris



Er. SM Takalkar & Er. PP Wahi (CBIP) in the exhibition hall at CIGRE Paris

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Delegate Registration



Working Group of Rajkot Seminar L to R S/Shri Sandip Parmar, NG Yadav, RS Shah, KN Velani, PA Shah, NC Solanki, HS Jadeja, SM Takalkar, KN Rathod, VB Kambad & Harendra Parmar



Digital presentation of Seminar by Er. KN Velani, Executive Committee Member, SPE(I) Vadodara Chapter



Anchoring of the Seminar by Er. PA Shah, Advisory Committee Member, SPE(I) Vadodara Chapter



Er. JT Baxi, LM-SPE(I) Vadodara and local coordinator of Rajkot briefing about Seminar



Er. SM Takalkar, Vice-Chairman, SPE(I) Vadodara Chapter presenting Vote of Thanks



Delegates



Delegates



Er. SM Takalkar conducts concluding session L to R Ers. KN Velani, PA Shah, VB Kambad, NG Yadav, RS Shah, SS Patel, SM Takalkar, KN Rathod & NC Solanki



Presentation of Certificates to participants by Er. RS shah

GLIMPSES OF RAJKOT SEMINAR



Dignitaries & Chief Guests on Dais during Inaugural Session L to R S/Shri SS Patel, AN Chandramouli, GV Akre, Jaimin Gandhi, Hemant Madeka, JT Baxi & SM Takalkar



Shri Hemant Madeka, Director M/s. Rolex Rings-Rajkot delivering speech



Shri AN Chandramouli, VP, Echjay Industries-Rajkot delivering speech



Er. GV Akre, Chairman, SPE(I) Vadodara Chapter briefing about SPE(I)

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