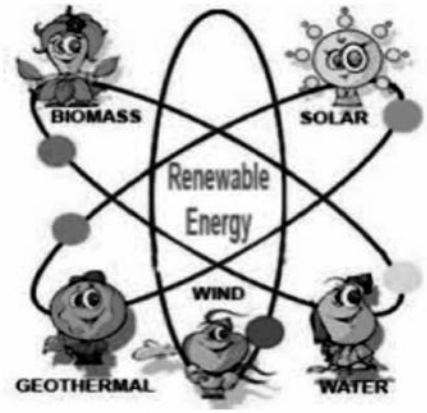
Issue No. : 1/2016
January, 2016

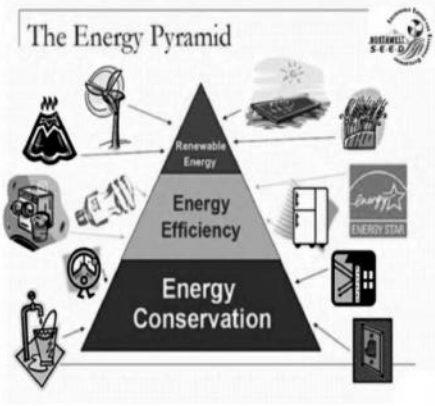


# S P E NEWS LETTER

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


## Happy Makarsakranti




**THE SOCIETY OF POWER ENGINEERS (INDIA)**
**VADODARA CHAPTER (ESTD. 1996)**
FF-48, AVISHKAR COMPLEX, OLD PADRA ROAD, VADODARA – 390 007
PHONE : (0265) 232 2355
e-mail: spevadodara01rediffmail.com
WEB: www.spevadodara.in

# OFFICE BEARERS & EXECUTIVE COMMITTEE MEMBERS FOR 2015-16

| | | | | | |
|---|---|---|---|---|---|
| 1. | Er. GV Akre | Chairman | 7. | Er. RN Purohit | Member |
| 2. | Er. SM Takalkar | Vice-Chairman | 8. | Er. KN Rathod | Member |
| 3. | Er. ND Makwana | Secretary | 9. | Er. BN Raval | Member |
| 4. | Er. GP Shukla | Jt. Secretary | 10. | Er. DC Mehta | Member |
| 5. | Er. KG Shah | Jt. Secretary | 11. | Er. JD Wadhwa | Member |
| 6. | Er. AN Makwana | Treasurer | 12. | Er. NG Yadav | Member |

## ADVISORY COMMITTEE

1. Er. VB Kambad
2. Er. VB Harani
3. Er. PO Kulshreshtha
4. Dr. RB Kelkar
5. Er. MG Mehta
6. Er. RS Shah
7. Er. MM Naik
8. Er. MM Patel
9. Er. SM Godkhindi
10. Er. PN Trivedi
11. Er. VJ Desai
12. Er. RR Vishwakarma
13. Er. JK Thakkar
14. Er. NV Vaidya
15. Er. KK Bhatia
16. Er. AR Shah

## OFFICE ADMINISTRATION COMMITTEE

1. Er. GP Shukla
2. Er.DC Mehta
3. Er.NC Solanki
4. Er. GM Bahudhanye

## EDITORIAL BOARD

1. Er. SM Takalkar
2. Er.NV Rede
3. Er.KN Rathod
4. Er.JK Surti
5. Er. JD Wadhwa

## SPECIAL INVITEE TO THE EXECUTIVE COMMITTEE

Er. N Dinker

## ACKNOWLEDGEMENT

Following member has donated to SPE(I) Vadodara

Er. Arvind H Patel  Life Member  Rs. 5,000

SPE(I) Vadodara Chapter thanks to above donor. SPE(I) further expects similar gesture from other members as well as from the well-wishers.

Executive Committee, Advisory Committee , Office Administration Committee and Editorial Board of SPE NEWS LETTER wish all the Members, Readers, Patrons and Well Wishers a **Very Happy New Years 2016**

# From The Chairman's Desk

I am happy to present first News Letter of year 2016, and wish you all very **Happy, Prosperous and Energetic New Year.**

One of the major events of year 2015 is the Agreement on Climate Change in Paris involving nearly 200 countries in the world. This has happened after nearly 20 years of meetings, discussions and negotiations among the leaders of most of the countries. During last few decades many eye opening disasters took place, which were believed to be the result of global warming and climate change. Many scientific evidences convincingly came through to prove this belief, which leads the world leaders to work seriously in signing this agreement on climate change.

However, there were many issues which were deliberated rigorously like responsibilities of developing and poor countries in causing carbon emission. They argued that developed countries are producing most of the emission and thus mainly responsible for causing the climate change. However, like other developing countries, India has agreed with Paris agreement after initial reluctance, to respect the global interest in reducing $CO_2$ emission. The agreement has become landmark event and every country will have to act seriously to implement it. As per agreement, developed countries are obliged to provide finance and new technologies to help developing countries to implement it. Many of the reform programmes our government is planning to implement, indicate that the government is already taking actions in controlling the emission in energy sector. Efficient Lighting Program (DELF) through which government is supplying LED lamps at highly subsidized rates for replacing incandescent and CFL lamps in households. The scheme is very attractive as it saves electricity bills for consumers. It is expected to save more than 100Billion kWh energy, thus reducing consumer bills by Rs. 40,000 crore.

It is reported very recently that central Environment Ministry has revised the norms for emission and water management in coal based thermal power stations, which is the largest generator of electrical energy causing emission. The norms are aimed to reduce emission of pollutants to 30 mg per cubic meters from exiting 100 mg. for new plants by adopting new technology. Very strict norms are set for water discharge in thermal power stations.

India has already planed very ambitious target for renewable energy of 1,75,000 MW in next 7 years which also will help us in keeping our commitments towards Paris agreement. Also revolutionary programs like smart grid, smart cities, digital India, and many such schemes will help in conserving energy.

With energetic work force of expanded committees of SPE(I) Vadodara chapter, we are now able to organize many activities for spreading the awareness needed for controlling global warming and its effect on our mother planet. We can effectively do so through our ongoing programs to reach students, industries and other places, and I appeal to all SPE(I) members to contribute by involving actively in this movement.

**G.V. Akre**
Chairmen

# Editorial

During various meetings of the Executive Committee and Advisory Committee, the issue of focusing of Chapter's activities towards Academic Institutions, is debated at length. Ultimately it is decided to make a core committee to explore the possibilities of going deep into the needs of academy in technical grooming of the would be engineers as well as updating the knowledge of teaching staff members.

The core committee has set the ball rolling. The members from the chapter hail from different disciplines such as Electrical, Mechanical, Civil / Structural, Instrumentation etc. It is a reality that power is the fore runner in the infrastructure development in this country. As a matter of fact, even a major civil engineering work also cannot start without power.

Therefore, it is natural that the passing out Engineering students will find more jobs in power sector such as power utilities, private power station and transmission line developers, major electrical contractors and equipment manufacturers.

With this background SPE(I), Vadodara thought it wise to organize various events for the final year students of various colleges in the state. To begin with, it is planned to have three 1-Day Workshops, each on Electrical, Mechanical & Civil/Structural Engineering on three different days.

The days selected are 24 January, 31 January and 07 February 2016 respectively for Electrical, Mechani-cal and Civil/Structural Engineering. These events are being organized on trial basis for Engineering Colleges around Vadodara. If these events meet with success, similar events will be organized by SPE(I), Vadodara, in different regions of the State.

Initial approach to the colleges indicates that there is keenness on their part. Even the teaching staff may also participate. The participant will be given a certificate of participation and also the lecture material of the workshop. Expert and exponent faculty members will be roped in for the event. The participating students will get exposure to the engineering aspects of the power sector. This will enhance their employability on passing out or during campus slection. Better placement ratio will add to the credit of the academic institution. So far as SPE(I), Vadodara is concerned, it will be able to fulfill one of its agenda (aim). Any surplus generated out of this event will be ploughed back for conducting similar activities in future.

It is also envisaged to rope in delegates from industries for this event. The members of society in general and the members of Executive/Advisory committee in particular, are requested to take note of the proposed academic events and strive hard to make them a grand success. The members can enthuse their own children, relative's/friend's children to participate in the event. Even an attempt can be made by everyone to rope in delegates from industries. Sponsorships and financial assistance are also welcome. Everyone should make efforts in this direction.

In addition to the above three pre-planned events, some colleges are likely to opt for an event in their colleges for the benefit of all the students and teaching staff. SPE(I), Vadodara will provide faculties for the event without much ascent on making profit.

Let us all work together to make the events and the scheme, a great success.

**Happy New Year of 2016 to all the readers.**

**SM Takalkar**
**Editor**

# Chapter's Activity

- On 27 Oct 2015, a lecture on "Viable Energy Storage- Options & Opportunities" was organized at GETRI Auditorium. As per the tradition the Chapter celebrates Power Day on 10 Nov. every year. However, due to Diwali Festival on 10 Nov, the same was preponed to 27 Oct 2015. Speaker, Er. SB Lele, an active member of SPE(I) Vadodara, delivered lecture. He stated that there is lot of potential of Renewable Energy World over but being unpredictable, its integration in the Power System is posing problems. Energy storage devices are, therefore, required to make such renewable acceptable. He went on to explain various likely modes of Energy Storage devices such as Pumped Storage, Batteries, Super conducting magnet, Flywheel, Regenerative fuel cell storage, Compressed air etc. The lecture was well received by the members present
- On 14 Dec 2015, a Panel Discussion on the theme of "Energy Conservation" was organized at GETRI Auditorium. The Chapter celebrates Energy Conservation day on 14 Dec every year. Experts and exponent faculty is invited to deliver talk on Energy Conservation / Management.

  The panelists and brief about their talk/presentation is as under:

  1. **Er. Rutvik Rawal,** GM(E), M/s Milacron

     In his speech, Er. Rawal stated that he concentrated upon following for saving energy:

     - Maintaining unity power factor as far as possible, to get rebate from power supplier.
     - Running of compressor through pressure settings
     - Lighting conservation by replacing conventional lighting by LED and replacing tube lights from 40W to 18W.
     - Providing Cooling tower fan motors sensor
     - Carrying out Thermography Inspection, avoiding electrical hazards
     - Providing Timers in HVAC
     - Adopting Energy conservation activates in plant by (i) Installation of Solar lights for compound lighting (ii) Monitoring air leakages in plant (iii) Electrical heating is replaced by PNG burner (iv) After treatment, re-use of sewage water for gardening

  2. **Er. Bharat Pandya**, GM(E), Philips(India)-Muval

     Er. Pandya stated that he initiated (i) Daily monitoring of each area of energy consumption (ii) Bi-weekly review of energy projects (iii) Commodity meetings to exchange energy saving ideas (iv) Adaptation of best engineering practices (v) Power purchase from Wind and exchange (vi) In house Nitrogen generation

  3. **Er. Vijay Chaudhary**, Sr. Manager, Mittal Processor-Surat

     Er. Chaudhary emphasized on Regular Energy Audit of running plants where pooling activities are focused and analysis of problems. He also stressed upon implementation of major recommendations such as (i) switch over from LDO to PNG for boiler, installation and blow down system for boiler and supply steam to ICP from this boiler (ii) installation of new air compressor lowering SEC.

     In the conclusion, he mentioned that Energy Audits will identify gaps in energy saving.

  5. **Er. SM Takalkar**, Vice-Chairman, SPE(I) Vadodara

     In his speech, Er. Takalkar stated that saving of resources like Steel, Cement, Aluminium, Copper etc. means a great saving of energy. He added that proper designs and construction practice can give good saving in resources.

  All the presentations and discussions were appreciated by the members present.

  Er. SB Lele was an Anchor for the whole programme.

# Electricity – Commodity OR Service

Normally the commodity (goods) traded in the market, is measured either in numbers or weight or volume and has physical existence in solid, liquid or gaseous form. Price of commodity is related to the aforesaid units. Some items available and are traded in bundle. For example bundle of number may be pair, such as boots and socks or set such as billiard balls or it may be in pack such as bottle of x numbers tablets/capsules. Bundle of weight is pack of tea leaves,tooth paste etc. Bundle of volume is bottle of hair oil, bottle of mouthwash etc.

In case of sale of commodity, merchant physically delivers item to purchaser against payment. Sold item become property of the purchaser for ever and has never to return the same to merchant in future, unless it is a contracted requirement or good will. It is also not the matter how the consumer uses the purchased items. The milk purchased can be used for preparing tea, coffee, milk shake, curd, butter, ghee or sweet etc.

Service is utilization of others' assets for specified period against payment. The payment is related to **time** i.e. period of utilization. The example of material asset is the facility developed by service provider such as hotel, rented house, resort, party plot, auditorium, audio system etc. and it is given for utilization by customer against payment. Utilization of some service may be in a group such as bus or taxi wherein utilization is for travel up to specified destination for each person or a group. So in case of service, nothing is delivered permanently but only temporary facility is given for utilization for specific period. The customer does not take away anything physically but only derives the satisfaction by use of the same. The other type of asset is capacity to do specific task such as plumber, carpenter and electrician. In this type of service, concerned i.e. plumber, carpenter or electrician, visit customer's premises along with tools and do the work as required by customer and at the end he go back. He does not leave any physical thing to customer except the work done by him. Other type asset is a knowledge The consultant may be legal, medical or technical. They pass on knowledge in the form of advice. They are paid for their services.

Therefore, there are two types of deal in practice. One is exchange of material against payment which is known as sale. Other is exchange of non-material items against payment as above which is known as service.

Supply of Electricity is a Service. It is not measured in Numbers, Weight or Volume but measured in kWH known as unit. Unit is flow of one ampere at rated voltage of 250V(1-phase) for **4 hours**. It is similar to unit of Day Wage of worker for **8 hours**. There is no physical delivery of any entity from supplier to customer. Current enters the customer premises through one conductor and equal current flows back through other conductor. Nothing is left at customer's premises except work done by the supplied power. Flow of Current is actualy a flow of electrons. Numbers of electrons visit customer's premises and all go back after doing the work assigned by customer viz. cooling, heating, lighting, motor operated equipment, welding etc. It is similar to carpenters visiting customer premises for furniture work and go back after doing the work. Their charges are related to numbers of carpenters and numbers of the days (period) they work at customers' premises. Likewise charges for electricity are also related to current (numbers of electrons) and hours (period). Supply of electricity is similar to supply of man power for work of customers. Man power supplier sends technicians/labours for doing work whereas electricity supplier sends electrons for doing work. Sales Tax applicable for commodity (goods) is claimed on electricity. The difference in electrical power supply service compared to other services, is that the consumer need not call any one for service. Consumer can switch on & off the supply at his will. He pays for what he uses and need not pay anything in advance. This feature of electricity makes it most versatile form of energy and therefore now, has become indispensable. It is difficult for anyone to think of life without electricity.

**Er.N. D. Makwana**
nd_makwana@yahoo.co.in

# Technical and Statutory Requirement for Establishment of Solar Power Plant

**SM Takalkar**
MD, TPEC

**PA Shah**
Practicing Engineer

## 1 INTRODUCTION:

**1.1** Worried about the fast depletion of fossil fuels, the energy managers and the governments all over the world have started exploring the renewable sources like wind, solar, biomass, biogas etc. These renewable sources, once being labeled as most expensive and technologically inferior, have now become a focal point and are becoming more and more viable day by day.

**1.2** The Solar Power falls under the category of Renewable Energy and have some benefits over the conventional power generator.

**1.3** The Developer may be Independent Power Producer – IPP or Captive Power Producer – CPP. Either IPP or CPP may be interested to take the benefit of Renewable Energy Certificate – (REC) to have a least payback period.

**1.4** Now a days absorption of solar power is becoming enlighten as par as power system stability is concerned.

**1.5** Also, developer has to move from one department to another department for obtaining various permissions and approvals.

## 2 BASIC ABOUT SOLAR POWER PROJECT – SPP:

**2.1** The sun is worshiped as a God in our Country, as it gives us solar energy as well as light during day time. It is observed that only 47% of the total solar energy reaches to the earth. Thus, only 47% amount of energy of sun can be used for generation of power and other activities like water heating, cooking food, etc. However, India is getting about 250 to 300 sunny days in a year and therefore can become world's leader in Solar Power.

**2.2** The thermofusion reactions occurring in the sun causes energy generation. It delivers visible light, infrared, ultraviolet rays, x-rays and radio waves to earth.

**2.3** The photovoltaic cells are capable to convert the sunlight in to electricity. A simple wafer of silicon with wires attached to the layers will produce the current based on the types of silicon. The voltage generated by each cell is about 0.5 volts.

**2.4** As there is no moving part in the solar power plant, there is no wear and tear of the equipment, but due to exposure to the nature, the expected life span of the solar panels is about 25 years.

**2.5** Further, the efficiency of solar energy is less than 77% of the solar spectrum with usable wavelengths. About 43% photon energy is utilized to warm the crystal. One important aspect in the Solar Power Plant is, as the temperature increases the efficiency reduces and vice a versa. In general, the estimated efficiency of plant is 24% at 0°c and 14% at 100°c.The overall efficiency of any Solar Power Plant is ranging from 14% to 20%.

**2.6** With the technological develop-ment, use of the photo voltaic cells and the solar panel manufacture has undergone tremendous change, bringing in a sharp decline in the cost.

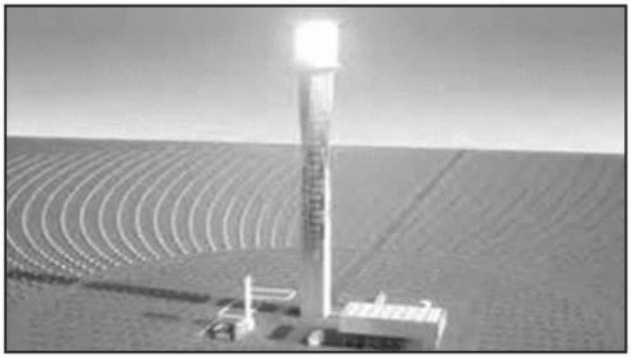
## 3 TYPES OF SPP :

**3.1** The solar power projects are classified on the basis of Mounting arrangement, Connectivity and type of Cell. The mounting arrangements are Ground Mounted, Roof Top, Canal Top and Canal Bank. The connectivity of power produced by solar generator may be the State Grid Connected and Non-grid connected, which is also known as Stand Alone Solar Power Project. The type of cells used in producing electrical energy, are Photovoltaic (PV), Concentrated Solar Power (CSP) and Solar Thermal Power Project (STP).

**Solar Power Plant**

**Tracking Arrangement**

**Thermal Solar Power Plant**



**Concentrating Solar Power Plant**

**Roof Top Solar Power Plant**

**Roof Top Solar Power Plant**

**Canal Top Solar System Power Plant of Sama at Vadodara, Gujarat.**

**Canal Top Solar System Power Plant of Sama at Vadodara, Gujarat.**

**3.2** The panels can be stationary or moving (sun tracking system)both of them has own advantages & disadvantages.

**4 SITE SELECTION:**

**4.1** The site selection criteria for Solar Power Projects are many, but technical points are as follows:

**4.1.1** Sun Direction shall be from North to South.

**4.1.2** Sufficient and cheap land should be available to make the plant economically viable.

**4.1.3** One can utilize un-used land like Government owned goucher (cattle grazing land),roof of big building, canal bank, canal top, even the corridor of railway and highway can also be used to harness solar power.

**4.2** The numbers of sunny days have equal weight age for establishment of Solar Power Plant.

**4.3** One of the important technical points is power evacuation scheme for delivering the power generated from solar power plant to the nearby substation of State Transmission Utility.

## 5 INDEPENDENT POWER PRODUCER – IPP:

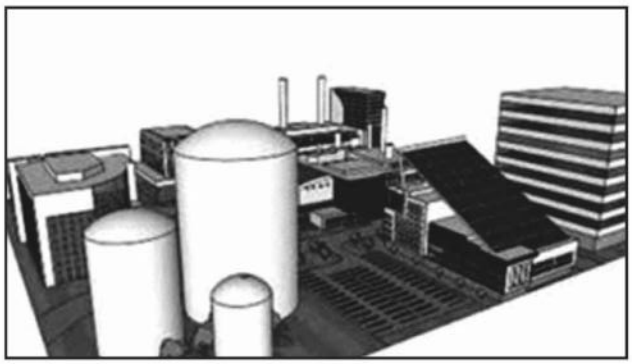
**5.1** Here the Owner of the plant is Developer &the energy Purchaser is generally a distribution utility (DISCOM). The power generated by owner is sold to DISCOM. The plant must be grid connected. Owner has to pay Wheeling Charges and transmission/distribution losses to the State Transmission Utility(STU)/DISCOM. The permissions from various authorities are required as listed separately. Power Purchase Agreement is to be executed between Developer / Owner and concerned Distribution Company.

## 6 CAPTIVE POWER PRODUCER – CPP:

**6.1** In this case, the owner of the plant and power consumer is the same. In this case power is generated and consumed in owners' premises. For standalone plant, no permission is required. While power is generated at one location & it is to be consumed at another location of the owner, grid connectivity is required. This can be done by paying the wheeling charges to the STU.

**6.2** Permission from Various authorities is required for this purpose. In addition to this, Power Wheeling Agreement is also to be executed between Developer and DISCOM. The transmission losses and distribution losses are accounted to arrive at the real cost of power to DISCOM.

**Power Generated and Consumed in the Same Premises.**



## 7 RENEWABLE ENERGY CERTIFICATE – REC:

**7.1** As per the statute, it is obligatory on the part of generating companies/utilities to have renewable source generation of at least 10% of the installed capacity of the company/utility. If this statutory require-ment is not fulfilled, there will be a penalty. Alternatively, the company/utility can buy REC (certificate).

**7.2** A REC is deemed as certificate of power generated from Renewable Energy sources. 1 REC = 1 Mega Watt hour of renewable energy generated. It can be sold or traded to meet mandatory Renewable Purchase Obligation (RPO) targets set by State Electricity Regulatory Commissions for renewable energy purchases by utilities/generating companies. The Exchanges identified for REC trading are Indian Energy Exchange & Power Exchange of India.

**7.3** The REC would be divided into two categories: one is Solar Certificate and another is Non-Solar Certificate which includes wind generation, bio-gas, biomass generation etc.

**7.4** RE generator can sale electricity either to the distribution licensee of the area in which the eligible entity is located at a price not exceeding the pooled cost of power purchase of such distribution licensee; or to any other licensee or to an open access consumer, at a mutually agreed price, or through power exchange at a market determined price. All REC based on captive power production shall be eligible for their entire energy generation including consumption of power for own use.

**7.5** REC mechanism is NOT an incentive scheme; rather its main aim is to enable sale and purchase of renewable component across the State boundaries. REC mechanism will coexist with all current incentive based schemes, since most of these schemes are based on certification of generation.

**7.6** In surplus scenario, maximum of 25% of REC, generated in a year, can be carried over only for next year.

**7.7** Though REC represent environmental attribute, it will not be related to carbon credits. These two mechanisms will operate independent of each other. The cross subsidy charges are payable in addition to non-availability of banking of power.

## 8 STATUTORY REQUIREMENTS:

**8.1** **State Nodal Agency** for registration of solar power project give approval of Installation, approval for consumption and approve the probable Date of commercial operation (COD).

**8.2** **State Transmission Utility** will conduct System Study for Power Evacuation Scheme. Grant Connectivity; execute Long Term Open Access - LTOP Agreement. Developer has to pay Transmission Charges @ 4% or Actual. The Operation &Maintenance of Transmission Line will be carried out by STU and Charges @ 1.5% pa is payable by Developer. Further, data transmission line for power evacuation scheme will be carried out by nearby substation; hence the developer has to pay Rental Charges for the use of space for RTU,

Modem, etc. to STU.

**8.3** **State Load Dispatch Centre** – It will carry out Data Integration and pay the charges on monthly basis.

**8.4** **DISCOM** – The distribution company, apply for LT/HT connection for energy consumption during non-generation period in the jurisdiction of Licensee where SPP is to be installed. Execute the agreement for the connection. Further, it will also execute the Power Wheeling Agreement with the concerned DISCOM, where power is to be consumed.

**8.5** **Pollution Control Board** – The plant has to be got registered with State Pollution Control Board by paying necessary fees. Consent for the Installation of Plant and to operate the Plant is to be obtained.

**8.6** **Electrical Inspection Authority**– The approval of drawings / specifications for equipment for Switch Yard and HT Lines to be installed in solar power plant has to be obtained from Electrical Inspector of the state. Also the approval for method of construction of equipment in the yard, solar project, etc. has to be obtained from him. The approval of drawings / specification for SPV cell, Inverter Transformer, Solar Modules, etc. is also to be taken. The charging Permission for Plant is also given by the Electrical Inspectorate.

**8.7** **CT & PT for metering** – This is very important approval. The specification for metering CT/PT is given by STU. A copy of order placed by Developer for metering CT & PT shall be furnished to STU. The factory testing is witnessed by representatives from STU & DISCOM at the works of the manufacturer and NABL accredited Laboratory. Further, site testing on metering CT/PT is carried out in presence of representatives of STU and Testing Laboratory of DISCOM &concerned Division of DISCOM.

**8.8** **ABT Meter** – The specifications for ABT meter is furnished by STU & DISCOM. The testing of ABT meter shall be carried in NABL Laboratory of DISCOM. The installation of ABT meter has to be done in presence of DISCOM and sealing of meter is done thereafter.

**9 ABSORPTION OF POWER:**

**9.1** Compared to the generation from wind turbine, the generation from solar power plant is more predictable. However, the ambient temperature and unexpected clouds can make a lot of difference in Solar Generation.

**9.2** The Solar panels need continuous cleaning. Any lacuna in the same may result into reduction in power generation in the range of 2% to 5%. Any incidence of local storm in the Solar Park having installed capacity of say 50MW or more may cause deposition of dust on the solar panels and can result in to considerable reduction in power generation.

**9.3** The U.I. charges will be levied on the defaulting Developers in case of drop in power generation compared to the guaranteed dispatches. However, if there is provision of Force Majeure in the Agreement, the U.I. penalty shall be viewed liberally.

**9.4** While it is a need to harness the green energy, there are monitory implications to the Load Despatches of the hosting states. The regulators are controlling the aspects of absorption of power in to the State Grid. Under certain condition of load dispatch, it may be cheaper for the utility to buy REC rather than lose on high cost solar power. The installed capacity of Solar Power in the State of Gujarat is 976MW and Solar Power Demand Catered is 771MW in March- 2015. The total installed capacity of power in Gujarat is 23997MW as on 31$^{st}$ Mar-2015 (5496MW State, 8126MW Private Participation, 5811MW Central Sector, 3542MW Wind, 976MW Solar, 41MW Biomass and 9MW Mini Hydro Sector) and peak is 14005MW.

**9.5** For Roof Top Solar Power Project, the policy is silent about metering. Presently two meters i.e. import and export are to be installed separately. Also, the purchase price by DISCOM is not specified or contracted. This aspect is preventing the roof top solar power generation from taking quantum jump.

**9.6** DISCOMs are yet to find a way out to absorb roof top solar power while not jeopardizing its technical as well as financial interest.

**9.7** It is necessary to bring uniform Solar Power Absorption Policy at National Level. Various stakeholders need to come on common platform and help the policy makers to make the Solar Power technically and economically viable renewable source. This will be a win-win situation for Developers, DISCOMs and Consumers.

**10. CONCLUSION:**

**10.1** Solar Power Generation is need of the time to get rid of the evils of consuming Fossil Fuel.

**10.2** Proper policy need to be formulated at National Level to give justice to all stakeholders.

**10.3** For encouraging roof top solar, it is necessary to carry out technical & financial exercise and arrive at the formula acceptable to all the stake holders.

**10.4** For hastening the process of Solar Power Installation, Single Window Clearance will be very useful instead of taking permissions from each department or organization.

# Random Thoughts

An average human mind goes through a number of thoughts in 24 hours. When we talk on 'thought', a multitude of thoughts bombard our mind. First and foremost is how, when, where, why- Thought is getting developed in our mind. What is the quality of thought – Is it a 'pure' or impure thought? How to evaluate? Unlike materials viz. Gold etc., the quality (purity) of which is measurable, whether we can measure the quality of thought? Is it a sin to have impure thoughts? If so, how it can be got rid of. Everything we do or think may be right (or wrong) but to equate impure or wrong things to 'sin' is not correct as it means enstrangement from God, because of which God is upset. They do further feel that God cannot get upset and his love is un-conditional.

One thing appears to be sure that one may have impure thoughts, but acting on impure thought can amount to undesirable actions. Therefore, one has to practice to have pure thoughts and if impure thoughts crop up, simply shift your attention so that impure thoughts vanish from mind. Mind-fullness is thekey. Accept, do not react, do not pursue, do not feel guilty.

**A story:**

There once was a little boy who wanted to meet God. He knew it was a long trip to where God lived, so he packed his suitcase with water and eatables and started his journey. When he had gone about three blocks, he crossed a park where he saw an old woman. She was staring at a flock of pigeons. He was tempted to rest there too.

The boy sat down next to her and opened his suitcase. He was about to take a drink of water when he noticed that the old lady looked hungry, so he offered her some food. She gratefully accepted it and smiled at him. Her smile was so pretty that the boy wanted to see it again, so he offered her some water. Once again she smiled at him. The boy was delighted! They sat there all afternoon eating and smiling, but they never said a word. As it grew dark, the boy realised how tired he was, and he got up to leave but before he had gone more than a few steps, he turned around, ran back to the old woman and gave her a hug. She gave him her biggest smile ever. When the boy opened the door to his own house a short time later, his mother was surprised by the look of joy on his face. She asked him, "what did you do today that made you so happy?" He replied "I had lunch with God." But before his mother could respond, he added "you know what? She's got the most beautiful smile I've ever seen!"

Meanwhile, the old woman also radiant with joy, returned to her hut. Her son who seldom noticed her and saw her only as a burden, was stunned by the look of her peace and joy on her face. She looked like she had found a treasure. Surprisingly he asked, "what, what did you do today that made you so happy?" She replied, "I ate in the park with God." But, before her son responded, she added, "You know, he's much younger than I had expected". He ignored her, thinking that old age was getting to her. But the old lady had the most rested and content sleep that night.

Moral: God is everywhere. We just need to share our happiness and make other smile to feel him.

**Note:** After reading the story, it reflected for some time on the flow of events and how contentment and happiness was felt by the two actors of the story i.e. a young boy and an old lady. The boy personifies the beautiful, radiant smile of the old lady as 'God' and the old lady finds 'God' in the boy for his loving, compassionate and sharing behaviour.

As against a simple and graceful way of feeling the presence of God, the religious fanaties have pushed/pushing this planet to a violent and dangerous situation. May better sense prevail!

**By N. Dinker**

# Future Programmes

- 1-Day Training/Workshop programme for Electrical Engineering Students, Teaching Staff and Industrial Engineers on 24 Jan 2016.
- 1-Day Training/Workshop programme for Mechanical Engineering Students, Teaching Staff and Industrial Engineers on 31 Jan 2016.
- 1-Day Training/Workshop programme for Civil Engineering Students, Teaching Staff and Industrial Engineers on 07Feb 2016.

The members of SPE(I) Vadodara and readers of the SPE NEWS LETTER may please take note and enthuse the Students, Teaching Staff and Industrial Engineers, in their known circles, to participate in the training Programme/Workshop.

Interested individuals or group can contact

**Er. S.M. Takalkar-** M.: 9925233951

**Er. N.D. Makwana** -M.: 9898148945

# Members in News

**Er. Bharat Dangar,** Life Member, SPE(I)-Vadodara has been elected as a Mayor of Vadodara Mahanagar Seva Sadan (Vadodara Municipal Corporation). He is an Asst. Professor in Faculty of Technology & Engineering, Maharaja Sayajirao University of Baroda, Vadodara. He has done Masters in Electrical Engineering from the same college.

Office bearers and Members of the Society of Power Engineers (I) Vadodara Chapter are proud that one of the Life Members of the Chapter has become a First Citizen of Vadodara City.

Best wishes and congratulations to Er. Bharat Dangar for his achievement.

# Appeal

The members of SPE(I) Vadodara and the readers of this NEWS LETTER are requested to help the organization in any one or more ways as follows:

1. Submit article for publication in the NEWS LETTER such as Short Story, Poem, Personal achievement etc.
2. Enthuse business houses and industrialists in your known circle, to sponsor advertisement in the quarterly SPE NEWS LETTER (Half page: Rs. 1000, Full page Rs. 1500)
3. Provide feedback (Readers' Views) regarding the contents and quality of publication, in writing(preferably e-mail)

Members are requested to note that invitation for monthly lecture programme will be sent in soft copy only i.e. (i) via e-mail to those who are having internet facility and have registered their e-mail Id (ii) through **sms** to those who do not have internet facility and have registered their mobile nos. It is difficult to communicate with those members who are yet to register their e-mail Id or mobile no. with SPE(I) office. These members are requested to register either their e-mail or mobile no. by sending SMS to following nos.

1. **Er. ND Makwana,**
   Secretary, Mob. 9898148945
2. **Er. JK Surti,**
   Editorial Board, Mob. 9925247318
3. **Er. NV Rede**
   Editorial Board, Mob. 9925233945

Book - Post

Printed Matter

From :
**The Society of Power Engineers (India)**
**Vadodara Chapter**
FF-48, Avishkar Complex,
Old Padra Road, Vadodara - 390 007.

To _____

_____

_____

Print & Design : AAKAR 9825039225, 2429225