



VIGNANA BHARATHI
Institute of Technology

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Electrolit Presents

Elecvoice

power rides the world forever...

*National
Engineer's Day
2013*

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contents

1. Message to readers from Dr.P.S.Subramanyam.	03
2. Small Photovoltaic Residential stand alone system.	03
3. Electrical Softwares.	04
4. Wireless Power Transmission System	05
5. Longest distributed HVDC Transmission line in the World	05
6. National Engineers Day	06
7. Power Electronics In Power Systems	08
8. XBOX One	08
9. Mini Grid	09
10. Achievements of EEE Dept.	10
11. Fun Corner	11



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Special Thanks

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MESSAGE FROM DR.P.S.SUBRAMANYAM

It gives me great Pleasure to note that the mini Journal, "ELECVOICE" is again making its Presence, to inform you about the news pertaining to Electrical and Electronics Engineering Department of Vignana Bharathi Institute of Technology and also to educate the students about the latest trends and Developments in Different Fields of their chosen area.

In this context I recollect the enthusiasm and thrill exhibited by Faculty and Students of E.E.E, Department, when 'ElecVoice' was first published and unveiled in the year 2007. It was the first departmental Publication in V.B.I.T. and I had the Privilege of Inaugurating it. The Publication, which was meant to be a departmental news letter giving details about the facilities made available in the department and express the Views of the Staff and Students of the department, turned into a mini journal, giving brief technical articles also, thanks to the Zeal and Enthusiasm exhibited by the students.

Always I proudly sat that the E.E.E. Department is the Pioneer in the college, in getting the branch association, "ELECTROKZ" started, in conducting the National level Student Paper Presentation Contest, in starting the Publication, "ELECVOICE", in Conducting Departmental Seminars etc.

I wish that the Publication is made available periodically and regularly in time and in due course of time it becomes a regular Scholarly Journal and will be helpful to the students in Improving their Knowledge and Skill.

Dr. Pisupati Sadasiva Subramanyam,
Senior Faculty, E.E.E. Department.

SMALL PHOTOVOLTAIC (PV) RESIDENTIAL STAND ALONE SYSTEM

Array Size: 10, 12-volt, 51-watt modules; I_{sc} = 3.25 amps, V_{oc} = 20.7 volts , Batteries: 800

The PV modules are mounted on the roof. Single-conductor cables are used to connect the modules to a roof-mounted junction box. Potential reverse fault currents indicate that a PV combiner be used with a series fuse for each PV module. UF two-conductor sheathed cable is used from the roof to the control center. Physical protection for the UF cable is used where required. The control center, diagrammed in fig., contains disconnect and over current devices for the PV array, the batteries, the inverter, and the charge-controller.

The array is divided into two five-module sub-arrays.

The modules in each sub-array are wired from module junction box to the PV combiner for that sub-array and then to the array junction box. Cable size 10 AWG USE-2 is selected for this wiring, and the requirement for each sub-array is $5 \times 4.06 = 20.3$ amps.

Evaluated with 75°C insulation, a 10 AWG cable has an ampacity of 35 amps at 30°C, which is greater than the actual requirement of 20.3 amps (5×4.06).



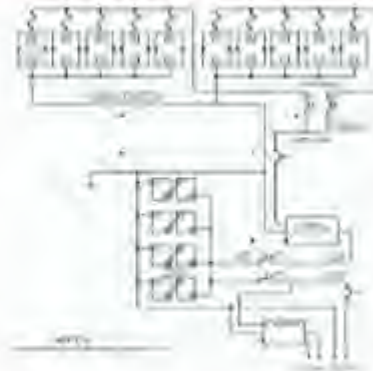
- The module short-circuit current is 3.25 amps
 - CONTINUOUS CURRENT: $1.25 \times 3.25 = 4.06$ amps
 - 80% OPERATION: $1.25 \times 4.06 = 5.08$ amps per module.
- The maximum estimated module operating temperature is 68°C.

In the array junction box on the roof, two 30-amp fuse sin pullout holders are used to provide over current protection for the 10 AWG conductors. These fuses meet the requirement of 25.4 amps (125% of 20.3) and have a rating less than the derated cable ampacity. In this junction box, the two sub-arrays are combined into an array output. The ampacity requirement is 40.6 amps (10 x 4.06). A 4 AWG UF cable is selected for the run to the control box. It operates in an ambient temperature of 40°C. Appropriately derated cables must be used when connecting to fuses that are rated for use only with 75°C conductors. A 60-amp circuit breaker in the control box serves as the PV disconnects switch and over current protection for the UF cable.

The minimum rating would be $10 \times 3.25 \times 1.56 = 51$ amps.

The inverter has a continuous rating of 500 watts at the lowest operating voltage of 10.75 volts and an efficiency of 90% at this power level. The continuous current calculation for the input circuit is 64.6 amps ($(500 / 10.75 / 0.90) \times 1.25$). The cables from the battery to the control center must meet the inverter requirements of 64.6 amps plus the DC load requirements of 6.25 amps (1.25 x 5).

A 4 AWG THHN has an ampacity of 85 amps when placed in conduit and evaluated with 75°C insulation. This exceeds the requirements of 71 amps (64.6 + 6.25). This cable can be used in the custom power center and be run from the batteries to the inverter. The discharge-circuit fuse must be rated at least 71 amps. An 80-amp fuse should be used, which is less than the cable ampacity. The DC load circuit is wired with 10 AWG NM cable (ampacity of 30 amps) and protected with a 15-amp circuit breaker. The equipment ground for the inverter must be an 8 AWG conductor based



Mrs.K. Neelima,
H.O.D EEEDept.

ELECTRICAL SOFTWARES

1. EMI Software: EMI has always been committed to providing high quality and dependable programs. Recently they have been focusing on developing prediction software for electromagnetic interference specifically for engineering and designing firms.
2. Electrist: Simply one of the best electronic and electrical engineering calculators available, Electrist is reliable, accurate and compatible with the widely popular Palm OS.
3. Circuit Magic: This fundamental software package is used across the world for educational purposes. Though the program covers many circuit calculations it focuses mainly on Kirchoff's laws, Node Voltage and Mesh Current methods.
4. NFPA, NEC: When it comes to electrical engineering software, these two are possibly the best unit conversion programs available on the market today.
5. LabVIEW: Anyone who is searching for electrical engineering software will more than likely be familiar with LabVIEW. This essential software program from National Instruments is one of the most commonly used programs for testing, control and measurements.

6. Sure Count : Believed by many to be the first symbol-recognition software program, Sure Count is now used primarily in the construction industry.
7. X Fusion Software: Need to speed up your drawing skills? This program will allow for all digital designers to complete digital timing diagrams in no time!

M.V. SUBRAMANYAM
ASSOCIATE PROFESSOR

Wireless Power Transmission System

Witricity is based on strong coupling between electromagnetic resonant objects to transfer energy wirelessly between them. This differs from other methods like simple induction, microwaves, or air ionization. The system consists of transmitters and receivers that contain magnetic loop antennas critically tuned to the same frequency. Due to operating in the electromagnetic near field, the receiving devices must be no more than about a quarter wavelengths from the transmitter. In their first paper, the group also simulated GHz dielectric resonators. The Witricity devices are coupled almost entirely with magnetic fields, which are argued to make them safer than resonant energy transfer using electric fields, since most materials couple weakly to magnetic fields. The Witricity devices are also claimed to be unusual in that they support efficient energy transfer for "mid-range" distances several times larger than the diameter of the resonant objects. 'strongly-coupled' resonances to achieve high power-transmission efficiency.

By: Mrs. K.S. Mani,
Associate Professor

THE LONGEST HVDC TRANSMISSION LINE IN THE WORLD

Transmission lines are divided by DC (Direct Current) and AC (Alternate Current). High-voltage Direct Current, called HVDC, is a form of transmission method used for long distance power delivery because of its ability to transmit current over very long distances with fewer losses than AC. For comparison, a thousand-mile HVDC line carrying thousands of megawatts might lose 6 to 8 percent of its power, compared to 12 to 25 percent for a similar AC line.

Another advantage of HVDC is that it would require fewer lines along a route; hence it is suitable for places with long distance from power plant to urban areas and for underwater under water electricity transmission.

HVDC might be higher compared to HVAC in terms of cost of investment, however, for long distance; HVDC is widely used to eliminate the line power losses. Below is the comparison between HVDC and HVAC:

HVDC in 2013, the world's longest transmission lines have been built with the length over 2,375 kilometers (1,550 miles) in southern Brazil in the Amazon area

This line has surpassed the Xiangjiaba-Shanghai system in China. It connects between two power plants; "Jirau" and "Santo Antonio" in the southeastern Brazil called Rio Madeira HVDC System.

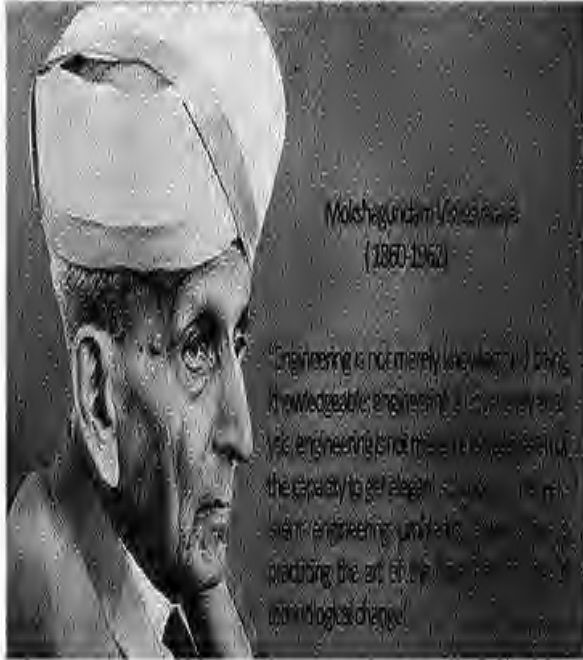
It is a good reference in remembrance of 'War of Currents' between Nikola Tesla and Thomas

By- Mr. A.Gopala Krishna,
Associate professor.



"Trust because you are willing to accept the risk, not because it's safe or certain."

PRIDE OF INDIA



Mokshagundam Visvesvaraya
(1860-1962)

"Engineering is not merely a vocation. It is a knowledgeable, engineering is a profession and vice versa. Engineering is not merely a profession but the capacity to get along with the modern engineering and to predict the art of the technological change."

Mokshagundam Visvesvaraya, popularly and affectionately known as Sir MV, was born on September 15, 1860 in a village known as Muddarahalli in Chikballapur Taluk, Kolar District. His father died in Kumool when Visvesvaraya was just 15 years old. Visvesvaraya completed his lower secondary schooling in Chikballapur. After schooling he joined Central College in Bangalore for his graduation.

In India Sept. 15 is celebrated as Engineer's Day in memory of our beloved Sir MV.

He lead a very simple life. He was a strict vegetarian and a teetotaler. He would go to sleep by 10 P.M. and wake up at 6 A.M. His diet included a very light breakfast, two slices of bread or chappatis, vegetables without spices, rasam, curds, Nanjangud bananas for lunch. He was known for his honesty and integrity. Before accepting the position of Dewan of Mysore, he invited all his relatives for dinner. He told them very clearly that he would accept the prestigious office on the condition that none of them would approach him for favours. Such things are unheard of these days.

Some of the job positions he held were

1. Assistant Engineer, Bombay Government Service (in 1884)
2. Chief Engineer, Hyderabad State (he served only for 7 months starting April 15, 1909)
3. Chief Engineer in Mysore State (Nov 15, 1909). He was also Secretary to the Railways.
4. President of Education and Industrial Development committees in Mysore State
5. Dewan of Mysore. (for six years starting 1912)
6. Chairman, Bhadravati Iron Works
7. Member of the Governing Council of the Indian Institute of Science, Bangalore
8. Member of the Governing Council of Tata Iron and Steel Company (TISCO)

1904 : Honorary Membership of London Institution of Civil Engineers for an unbroken period of 50 years

1906 : Kaisar-i-Hind* in recognition of his services

1911 : C.I.E. (Companion of the Indian Empire) at the Delhi Darbar

1915 : K.C.I.E. (Knight Commander of the Order of the Indian Empire)

1921 : D.Sc. - Calcutta University

1931 : LL.D. - Bombay University

1937 : D.Litt. - Benaras Hindu University

1943 : Elected as an Honorary Life Member of the Institution of Engineers (India)

1944 : D.Sc. - Allahabad University

1948 : Doctorate - LL.D., Mysore University

1951 : D.Litt. - Andhra University

1953 : Awarded the Honorary Fellowship of the Institute of Town Planners, India

1955 : Conferred 'BHARATHA RATNA' (The gem of India), the highest distinction of the country

1958 : Durga Prasad Khaitan Memorial Gold Medal' by the Royal Asiatic Society Council of Bengal

1959 : Fellowship of the Indian Institute of Science, Bangalore

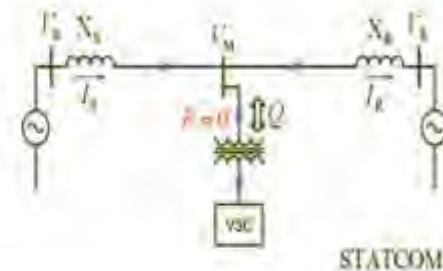
When Sir M. Visvesvaraya cleared his engineering, Government of Bombay offered him a job and appointed him Assistant Engineer at Nasik. As an engineer, he achieved some marvelous feats. He planned a way of supplying water from the river Sindhu to a town called Sukkur. He devised a new irrigation system called the Block System. He devised steel doors to stop the wasteful flow of water in dams. He was the architect of the Krishnaraja Sagara dam in Mysore. The list is endless.

Sir M. Visvesvaraya lead a very simple life. He was a strict vegetarian and a teetotaler. He was known for his honesty and integrity. In 1912, Maharaja of Mysore appointed Visvesvaraya as his Dewan. Before accepting the position of Dewan of Mysore, he invited all his relatives for dinner. He told them very clearly that he would accept the prestigious office on the condition that none of them would approach him for favours. As Dewan of Mysore, he worked tirelessly for educational and industrial development of the state. When he was the Dewan many new industries came up. The Sandal Oil Factory, the Soap Factory, the Metals Factory, the Chrome Tanning Factory, were some of them. Of the many factories he started the most important is the Bhadravati Iron and Steel Works.

Sir M. Visvesvaraya voluntarily retired as Dewan of Mysore in 1918. He worked actively even after his retirement. Sir M. Visvesvaraya was honored with Bharat Ratna in 1955 for his invaluable contribution to the nation. When he reached the age of 100, the Government of India brought out a stamp in his honor. Sir Visvesvaraya passed away on April 14, 1962 at the age of

POWER ELECTRONICS IN POWER SYSTEM

DESCRIPTION: A static synchronous compensator (STATCOM), also known as a "static synchronous condenser" ("STATCOM"), is a power electronic device used in power system for regulating device used in alternating current electricity transmission networks. It is based on a power electronics voltage-source converter and can act as either a source or sink of reactive AC power to an



reactive AC power to an electricity network. If connected to a source of power it can also provide active AC power. It is a member of the FACTS family of devices.

PURPOSE: Usually a STATCOM is installed to support electricity networks that have a poor power factor and often poor voltage regulation. There are however, other uses, the most common use is for voltage stability. A STATCOM is a voltage source converter (VSC)-based device, with the voltage source behind a reactor. The voltage source is created from a DC capacitor and therefore a STATCOM has very little active power capability. The reactive power at the terminals of the STATCOM depends on the amplitude of the voltage source. For example, if the terminal voltage of the VSC is higher than the AC voltage at the point of connection, the STATCOM generates reactive current; on the other hand, when the amplitude of the voltage source is lower than the AC voltage, it absorbs reactive power. The response time of a STATCOM is shorter than that of an SVC, mainly due to the fast switching times provided by the IGBTs of the voltage source converter. The STATCOM also provides better reactive power support at low AC voltages than an SVC, since the reactive power from a STATCOM decreases linearly with the AC voltage (as the current can be maintained at the rated value even down to low AC voltage).

BY : B.PREETHAM, I V -EEE

CAN YOU TALK WITH YOUR T.V. ?

Yes it is possible now with the help of Xbox One. Now your T.V. will respond to your commands and gestures. Xbox One effectively creates what might be called the first genuinely "smart" television. You'll be able to talk to Xbox One by saying "Xbox" and issuing a command; the device is capable of reacting to your gestures and movements, with the help of built-in Kinect sensor; and you can control it with a smartphone or tablet via the Integrated Smart Glass service.

Kinect is a motion sensing device by Microsoft for the Xbox One console and Windows PCs. Based around a webcam-style add-on peripheral for the Xbox One console.



By: M.Mahesh, I V -EEE

MINI GRID

Mini-grids are small electrical distribution systems connecting multiple customers to multiple sources of generation and storage. Mini-grids are typically characterized by multipurpose electrical power service to communities with populations ranging up to 500 households with overall energy demand ranging up to several thousand kWh per day. Three different application domains of mini grids may be as follows:

i. Village Micro-grids: The village micro grids provide ac electricity to "off-grid" settlements offering step up from batteries, solar home systems and portable engine-generators.

ii. Diesel mini-grids: Diesel mini-grids are established as independent power grids using (primarily) diesel engines as the generation source. They supply the power to remote communities, industries and for other local demand.

iii. Urban mini-grids: Urban mini-grids are the local distribution networks in developed areas that have a utility grid. The mini-grid can operate autonomously with local generating sources or interconnect to operate in parallel with the utility grid



Indian initiatives in mg development

Mini-grids are found to be a better option for supplying renewable energy based reliable power to remote rural communities. However, the challenge is to maximize the benefits of subsidy while ensuring that the consumer is happy to pay for the services. The MNRE provides a subsidy. Innovations in accessing local developmental and state funds for setting up the village level utility, and ensuring it's O&M from the sale of electricity, have brought clean electricity services within affordable limits to the rural consumer.

Conclusion

The mini grids are advantageous in remote areas to provide sustainable, reliable electricity and cost effective electricity. In many cases grid extension is often highly costly and unlikely to happen—even in the medium-to long-term. In these scenarios, mini-grids could provide an ideal intermediary solution, especially for small towns or large villages where enough electricity can be generated to power household use, as well as local businesses. When it is used in conjunction with renewable or hybrid systems, they can increase access to electricity, without undermining environmental fac-

By: B.Manasa , I V -EEE

FACULTY ACHIEVEMENTS OF EEE DEPARTMENT

1. A paper has been presented on "OPTIMIZATION APPROCH FOR POWER FACTOR CORRECTION AND CAPACITOR PLACEMENT IN A DISTRIBUTION SYSTEM" in SPRINGER's international conference in Chennai in Feb-2013.
By- Dr. P.S.Subramanyam
-Ms. K.Neelima
2. A paper has been published on " DIFFERENTIAL EVOLUTION BASED OPTIMIZATION APPROCH FOR POWER FACTOR CORRECTION" in International Journal of Electrical & Power Engineering in July-2013.
By- Dr. P.S Subramanyam
-Ms. K.Neelima
3. A paper has been published on " AN OVERVIEW OF VOLTAGE PROFILE IMPROVEMENT USING DVR" in IEAT in Dec-2012.
By- Mrs. M.Sharanya
4. A paper has been published on" EFFECT OF CARRIER FREQUENCY ON T.H.D IN CLOSED LOOP CONTROL LOOP CONTROL OF 5 LEVEL MULTI LEVEL INVERTER FED 3 ϕ INDUCTION MOTOR" in IJER in May-2013.
By- Mr. M.V.Subramanyam
Mrs. K.Samanthika Mani
5. A paper has been published on "FUZZY LOGIC CLOSED LOOP CONTROL 5 LEVEL MULTI LEVEL INVERTER DRIVEN 3 ϕ INDUCTION MOTOR" in IJEPD in June-2013.
By- Mr. M.V.Subramanyam
-Mr. G.Poorna Chandra Rao
6. A paper has been published on "PARTICLE SWARM OPTIMIZATION TECHNIQUE TO SAVE UNIT COMMITMENT PROBLEM" in IJACR in June-2013.
By- Mr. G.Poorna Chandra Rao
7. A paper has been published on "INTELLIGENT LOW COST MOBILE PHONE BASED IRRIGATION SYSTEM USING ARM." in IJER in June-2013.
By- Mr. A.Gopala Krishna
-Mr. Sathyasayana
-Ms. J.Archara
8. A paper has been published on "SPACE VECTOR MODULATION ALGORITHM FOR A MULTI LEVEL INVERTER" in IJER in June-2013.
By- Mr. I.Rahul
-Mr. M.Santhosh

EVENTS CONDUCTED UNDER ELECTROKZ

CPRI Visit

The power house of the India electrical industry, set up in 1960 by the government of India, it functions as a center for applied research in electrical power engineering assisting the electrical industry in product development and quality assurance. CPRI also serves as a independent authority for testing and certification of power equipment.



The Head of the department Mrs.K.Neelima and two faculty members Mr.Gopal Krishna and Mr.Ramesh, by final year B.Tech. EEE and M.Tech, went on an industrial visit to the central research institute of power on 23rd August 2013.

Guest Lecture

EEE Department had taken up a technical lecture program on need of Power Electronics Application to Electrical drive and also briefing on power electronic systems, modern electrical drive system, modern variable speed system, Power Electronic Converters in ED Systems and Modeling and Control of Electrical Drives.

The session started with the introductory speech by HOD EEE dept Mrs.K.Neelima followed by an eye opening session by the honorable guest Dr.Gurram Ravindranath(MVSR Engineering college,Dean(R&CE),professor,Dept of EEE)

On 25th July 2013



"Success is walking from failure to failure with no loss of enthusiasm."

FUN CORNER

Electrical quiz...

1. True or false? You can extend battery life by Storing at lower temperature.
2. Give an example of alternating energy.
3. The generation voltage is usually between_.
4. if DC motor is connected across AC supply it will_.
5. What would you call a power failure?
6. Can capacitance be negative?
7. What is the full form of AMF?

Tongue twisters...

- Mr. Tongue Twister tried to train his tongue to twist and turn, and twit an twat, to learn the letter "T".
- "The sixth sick Sheik's sixth sheep is sick"

Phrases to be repeated rapidly..

- Red leather, yellow leather.
- Upper roller, lower leather.
- Rally lorry, lorry roller.

Brain Teasers

1. The City of Power——ELECTRICITY
2. The City related to distance and Power——VELOCITY
3. The Native that has 2 or more possibilities——ALTERNATIVE
4. The Rent that everyone has to pay——CURRENT

5. The city with which a condenser is able to store energy——CAPACITY
6. The age old potential difference——VOLTAGE
7. The law that can weigh tons——NEWTONS LAW
8. The law which has lens——Lenz's Law
9. The law that has well——MAXWELLS LAW]
10. The law that has god's symbol name——OHMS LAW

By:

M.V .SUBRAMANYAM
ASSOCIATE PROFESSOR

Riddles...

- 1) What comes once in a year, twice in every month, four times in every week, and six times in each and every weekend?
- 2) What was given to you belongs to you exclusively and yet is used more by your friends than by yourself?
- 3) What is black when it's clean and white when it's dirty?
- 5) What two things can you never eat for breakfast?
- 6) Two girls were born to the same mother, on the same day, at the same time, in the same month and year and yet they're not twins.
How can this be?



"Big pay and little responsibility are circumstances seldom found together"

EVERY GENERATION NEEDS A NEW REVOLUTION



Best wishes from :
EEE Dept.

Special Thanks
College Management,
Principal , Vice Principal .

send your feedback at :electrox.eee@gmail.com