E-VIDYUT

VOLUME-13

MARCH 2019

ELECTRICAL AND ELECTRONICS ENGINEERING

INDEX

PRINCIPAL MESSAGE

It Is pleasure to present my views for EEE magazine for E-VIDYUT VOLUME 13, March 2019. The Department of Electrical and Electronics Engineering has always been one of the most active and happening Departments of our Institute and has brought us lot of pride over the past. The Institute as a whole has been undergoing very drastic reforms in terms of curriculum updation and course structure. The EEE Department has taken up these readily which we hope will work for the benefit of the students. we look forward to the feedback on the same to ensure we are moving on the right path.

It is always good to see the students bring out their creative and hidden talents in any form and this would be a perfect platform for the students of the Department. This would also serve as an apt magazine for the sharing of technical articles by faculty and students from their respective areas of research. All the very best.

Dr. S. Krishna Mohan Rao

HEAD OF THE DEPARTMENT MESSAGE

It is my pleasure to pen my views for release of this semester issue of E-VIDYUT March 2019. I am extremely delighted to acknowledge that the editorial team has done a stupendous job of subsuming all the key events which have taken place over the course of last few months. To Top it off, this Magazine includes major events witnessed by our department as well as Engineering Advances in the Electrical Field. The essential objective of the Technical Magazine is to inform, engage, inspire and entertain a diverse readership " including students, faculty, parents and alumni- with a timely and honest portrait of our department activities.

This issue has made an earnest attempt in this direction and all the credit for its success falls upon faculty and students who have worked with dedication and enthusiasm to bring the issue forward. I convey my regards to all the readers.

Prof. Ganesh Prasad Khuntia

EDITORIAL BOARD

Welcome to the volume-13 edition of the E- Vidyut. We are really proud and exuberant to acclaim that we are prepared with all new hopes and hues to bring out this edition which is going to unfold the unraveled world of the most precious and proud moments of the EEE Department. The magazine is to be viewed as a lunch pad for the student's creative urges blossom naturally. As the saying goes, mind like parachute works best when opened.

This humble initiative is to set the budding minds free and allowing them to roam free in the realm of imagination and experience to create a world beauty in words. The enthusiastic Write ups of our young editors are undoubtedly sufficient to hold the interest and admiration of the readers. This magazine is indeed a pious attempt to make our young talents to give shape to their creativity and learn the art of being aware because I believe that success depends upon our power to perceive, observe and the power to explore. We are sure that the positive attitude, hard work, sustained efforts and innovative ideas exhibited by our young buddies will surely stir the minds of the readers and take them to the surreal world of unalloyed joy and pleasure.

FACULTY MEMBERS

Prof. Sudhansu Bhusan pati

Dr. Srikant kumar Das

Prof. Subrat Kumar Panda

Prof. Saumendra Behera

Dr. Sujit Kumar Panda

STUDENT MEMBERS

Truptimayee Nayak(3rd yr)

Ashutosh Mishra (3rd yr)

Swetasingdha Panda(2nd yr)

Prasad Maharana(2nd yr)

ABOUT DEPARTMENT

The Department of Electrical and Electronics Engineering was established in the year 2007. It aims at producing qualified engineers in the areas of electrical machine, power electronics, control system, power system, and instrumentation. The field of Electrical and electronics is advancing at a very rapid pace. Power electronics has taken the center stage in every area be it power systems, control systems, power quality, etc. The department is well equipped with a group of highly qualified and dynamic teachers. It boasts of laboratory facility to be one of the best in the state. The students are encouraged and motivated to take up challenging projects. Summer training, industrial visit and projects are carefully planned for the students to remain updated with the technology trend. Seminars and short courses are regularly organized to update the students with the latest in the education and industry trends.

VISION AND MISSION OF THE DEARTMENT

VISION

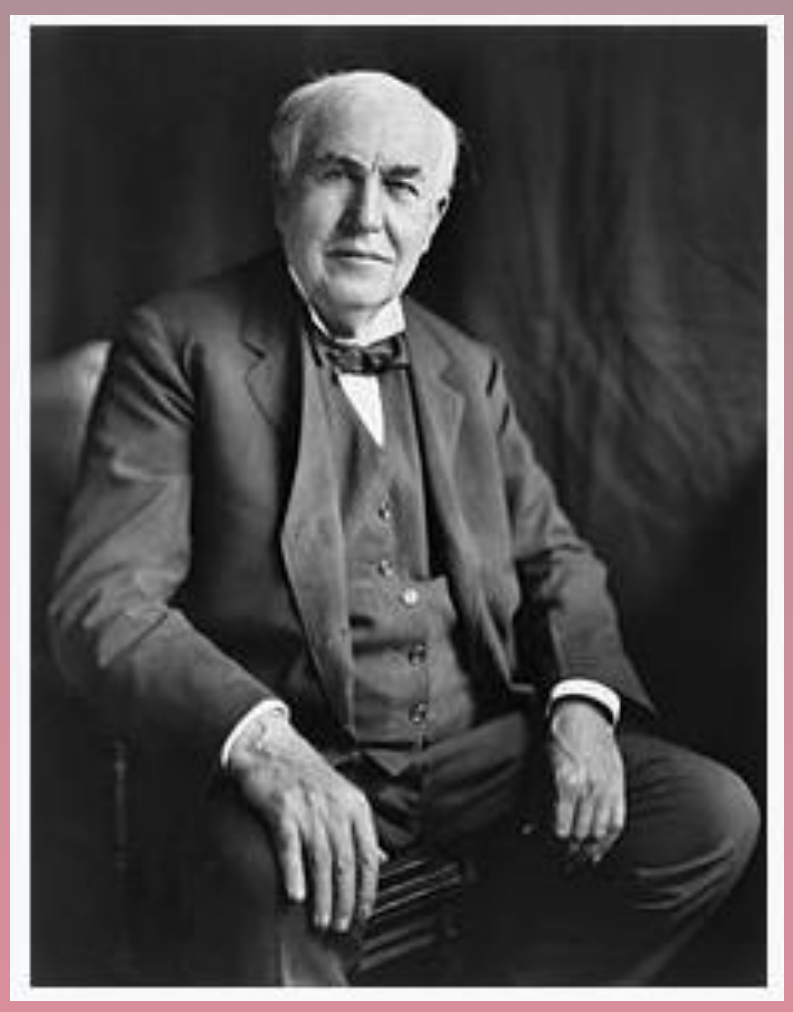
To create a distinctive culture, that could enable students and faculty members collaboratively approach to advance their knowledge about recent advancements in the core domains of electrical and electronic engineering such as power electronic, smart grids, renewable energy etc., and develop effective, implementable and environment friendly solutions towards solving the energy vs. sustainability crisis for present and future society.

MISSION

- To create a culture of research and Innovation through necessary collaboration with the premier institutions to purse career in research.
- To develop a distinctive environment where student, teacher can learn and acquire necessary knowledge and skills through effective collaborations and holistic interactions.
- To create a conducive ambience where students and faculty members can engage themselves for developing effective solutions for recent as well as prominent future challenges in the area of energy generation, transmission and distribution.
- To Generate a Pool of eco-pruners and entrepreneurs with the ability to address the industry and social problems and should be able to provide weight age towards Society and sustainable energy issues

SCIENTIST OF THE QUARTER

Thomas Alva Edison



Thomas Alva Edison (February 11, 1847 – October 18, 1931) was an American inventor and businessman who has been described as America's greatest inventor. He developed many devices in fields such as electric power generation, mass communication, sound recording, and motion pictures. These inventions, which include the phonograph, the motion picture camera, and the long-lasting, practical electric light bulb, have had a widespread impact on the modern industrialized world He was one of the first inventors to apply the principles of organized science and teamwork to the process of invention, working with many researchers and employees. He established the first industrial research laboratory

Edison was raised in the American Midwest; early in his career he worked as a telegraph operator, which inspired some of his earliest inventions. In 1876, he established his first laboratory facility in Menlo Park, New Jersey, where many of his early inventions were developed. He later established a botanic laboratory in Fort Myers, Florida in collaboration with businessmen Henry Ford and Harvey Firestone, and a laboratory in West Orange, New Jersey that featured the world's first film studio, the Black Maria. He was a prolific inventor, holding 1,093 US patents in his name, as well as patents in other countries. Edison married twice and fathered six children. He died in 1931 of complications of diabetes.

RELIABILITY & DEREGULATION

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The natural monopoly of the transmission and distribution network operators has created a well-founded concern that the reliability of the power supply will decrease in future. To prevent this, a certain amount of regulation is unavoidable. A regulatory body needs to collect and publish performance indicators of all transmission and distribution companies. The regulatory body also needs to set standards for the reliability performance, including a penalty system. Possible options are the payment of compensation to customers and a control of the distribution and transmission charges depending on the reliability performance. The techniques for the data collection and the calculation of performance indicators are well developed and can directly be used.

The risk of a serious blackout requires a somewhat different approach. The consequences of such an event are so large that it is not appropriate to wait for the collection of sufficiently confident statistics. Some kind of stochastic prediction of the risk of a blackout needs to be applied to the system. When this risk becomes unacceptably high, the regulatory body should intervene. In many deregulated markets, this task lays with the operator of the transmission grid. Unfortunately, implementation of the task is not very transparent. The main problems are expected at transmission level.

Various markets mechanisms may also be used to prevent too much reduction in supply reliability, especially to prevent shortages in generation capacity and in transport capacity in the transmission network.

New reliability analysis tools need to be developed to include the uncertainties of the market in reliability planning tools, and to enable the application of reliability techniques at the system operational level.

Modelling of PV Cells & its Impact on Grid

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Generation of solar energy has tremendous scope in India. The geographical location of the country stands to its benefit for generating solar energy. The reason being India is a tropical country & it receives solar radiation almost throughout the year, which amounts to 3000 hours of sunshine. This is equal to more than 5,000 trillion KWh. Almost, all parts of India receive 4-7 kwh of solar radiation per sq. meters .This is equivalent to 2300 -3200 sunshine hours per year.

Electricity demand,, a rising interest in clean technologies ,saturation of oil resources and energy security are reasons for demand for renewable energy generation systems which is rising every year.

Among all the renewable energy sources the use of solar energy is increasing rapidly due to its availability & advancement in Photovoltaic technology.

But integration of PV technology to utility grid is a critical process. In this present scenario current controlled pulse width modulated voltage source inverter is widely used.

SOLAR PV MODULE:- Photovoltaic modules are composed of many PV cells connected in series (usually 36 no's) (Ethyl vinyl acetate) An insulating tidlar sheet is placed beneath PV modules are thin silicon wafers sealed between a layer of toughed glass & layers of EVA (Ethyl Vinyl Acetate).An insulating tidlar sheet is placed beneath layers for further protection.PV systems are generally classified as grid connected and stand- alone systems. Fig 1 and fig.2

Grid- connected PV systems operate in parallel with & interconnected with the electric utility Grid. The primary component is inverter PCU(Power conditioning unit).PCU which converts DC power by PV array in to AC power in consistency with voltage & power quality requirement of utility Grid .A bi-directional interface is made between PV system AC O/P circuits & electric Utility network.

Stand-Alone PV systems operate independently and are designed to supply certain DC or AC electrical loads. These systems are powered by PV array only

The V-I characteristics of a PV module as shown in fig. 1 is a non-linear graph between current and voltage generated by a PV module (Maximum Power Points) are shown to represent the point at which power drawn from a PV module is maximum . MPL represent the track or path tracked by maximum power point tracking (MPPT).

The P-V Characteristics of a PV module as shown in fig .2 is a non linear graph plotted between power & voltage of a PV module, for different densities W/m 2 ,different graphs are plotted.

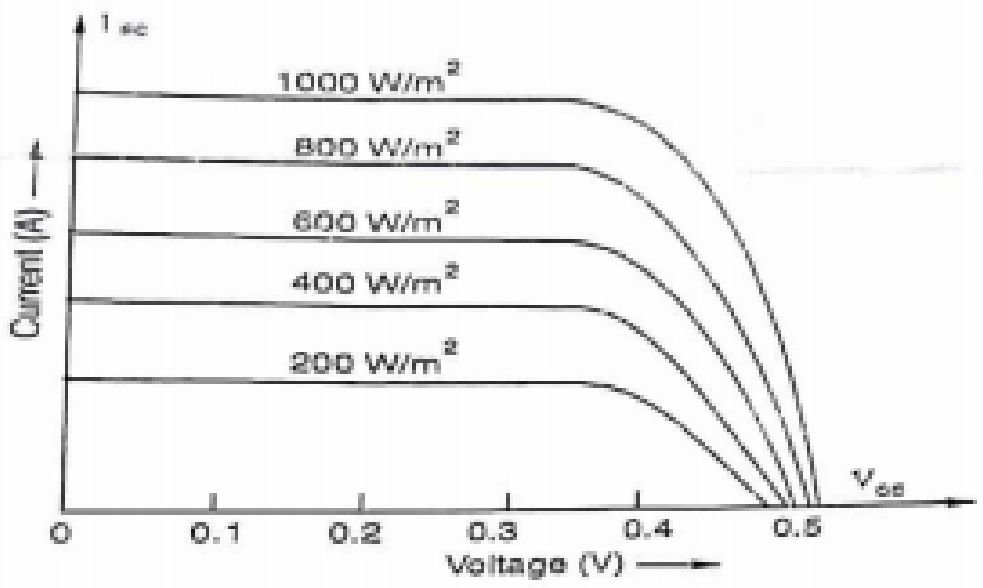

Figure 1- V-I characteristics of a PV Module

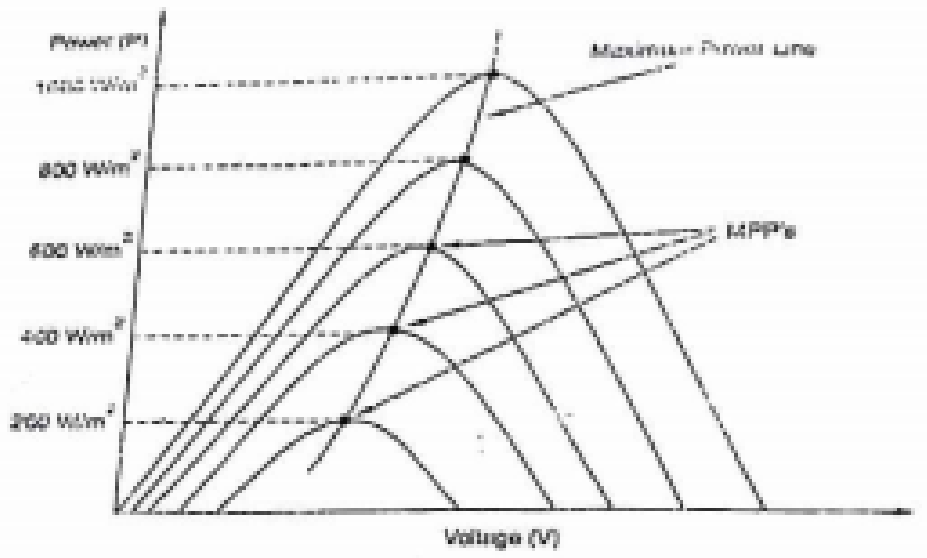

Figure 2- P-V Characteristics of a PV Module

Designing PV cells with some electrical appliances like DC-DC boosters are very useful in boosting up the voltage where ever it is necessary & also for suppressing the ripples, etc. DC-DC choppers with variable duty cycle can be used along with filters.

Energy Storage System

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Introduction

Electrical power infrastructures are changing dramatically around the globe due to smart grid initiatives, the establishment of renewable and the resulting distributed nature of creating electricity, the need for independent micro grids to ensure grid reliability, new demands from end users, the need to reduce greenhouse gas emissions, as well as the capability to accommodate mixed energy resources. As a result, the power network faces great challenges in generation, transmission and distribution to meet new and many times unpredictable demands of providing coherent electricity supply. Electrical Energy Storage (EES) has been considered a game changer with a number of technologies that have great potential in meeting these challenges. The suitability of a storage technology is determined primarily by its power and energy capacity and the rate at which these can be stored and delivered. Other characteristics to consider are roundtrip efficiency, cycle life, calendar life, safety, reliability, effect on the environment and ramp rate (how fast the technology can respond to a command). Other energy storage technologies such as compressed air fly wheel, and pump storage do exist, but recent generation focuses on battery energy storage systems (BESS) and its related applications.

Overview of the Energy Storage Technologies

Today, most common battery chemistries are based on lead, nickel, sodium and lithium electro chemistries. Emerging technologies like flow batteries utilize various transition metals like vanadium, chromium and iron as the electro active element. Carbon electrodes are a critical part of several of these battery systems. . Each storage type has distinct characteristics, namely, capacity, energy and power output, charging/discharging rates, efficiency, life-cycle and cost that need to be taken into consideration for possible applications. Understanding their chemical characteristics and related regulations are critical steps for possible use. This includes the application, sitting, installation, operation and maintenance, as well as shipping and disposing of used batteries. This topic presents a survey of available and emerging battery technologies and their design and performance characteristics. Electric Double Layer Capacitors (often referred to as ultra capacitors or super capacitors) are also addressed in this topic.

Lead acid batteries:

The lead-acid battery was invented in 1859 by French physicist Gaston Planet and it is the oldest and most mature rechargeable battery technology. There are several types of lead-acid batteries that share the same fundamental configuration. The battery consists of a lead (Pb) cathode, a lead-dioxide (PbO_2) anode and sulphuric acid electrolyte (H_2SO_4). The deep cycle/traction and the traditional stationary battery types are the most commonly used in Smart Grid applications. The deep cycle battery is composed of very thin plates and has a low energy density; however, its relatively high power density makes it attractive for use in motor vehicles to provide the high current required for power engine starters

The larger format and thicker plate stationary battery is used in a number of applications where interruption to the load cannot be tolerated. Common use in the energy space includes standby backup power for switchgear, turbine motors, data centres and any other application where reliability of the load is critical. Lead-acid batteries are widely used because they are less expensive compared to many of the newer technologies and have a proven track record for reliability and performance.

Nickel–Cadmium batteries

The nickel–cadmium battery (NiCd) is a rechargeable battery using nickel oxide hydroxide and metallic cadmium as electrodes. Wet-cell nickel-cadmium batteries were invented in 1899. A NiCd cell delivers around 1.2 volts output voltage until nearly the end of discharge. Compared with other types of rechargeable batteries, NiCd batteries offer satisfactory life-cycle characteristics and improved performance at low temperatures with a good capacity retention at high rates. However, the material costs are higher than that of the lead acid batteries. Moreover, NiCd cells experience the so called “memory effect” and high self-discharge rates which have a great impact to their performance characteristics. In addition, an environmental concern on the disposal of the toxic metal cadmium has dramatically reduced the use of NiCd batteries.

Nickel–metal hydride batteries

A nickel–metal hydride battery (NiMH) is also a type of rechargeable battery. Similarly to NiCd batteries, NiMH cells use nickel oxide hydroxide (NiOOH), which is formed in the positive electrode. The use of Cd in the negative electrode is replaced by a hydrogen-absorbing alloy. A NiMH battery can have two to three times the capacity of an equivalent size NiCd, and its specific energy of 80Wh/kg is about 50% of a lithium-ion battery. Main applications of the NiMH batteries are found in consumer electronics and plug-in electric vehicles and hybrid vehicles due to the technology maturity and their competitive cost to Li-ion batteries. However, Li-ion batteries are considered to most promising for the EV industry mainly due to their continuously falling cost and improved performance.

For example, lithium cobalt oxide (LiCoO2) batteries are used in most handheld electronics due to their high energy density and low weight. Other types such as Lithium iron phosphate (LiFePO4), lithium ion manganese oxide batteries (LiMn2O4, Li2MnO3, or LMO) and lithium nickel manganese cobalt oxide (LiNiMnCoO2 or NMC) offer lower energy density, but can provide longer lifetime and inherent safety. These types are widely used for electric tools and medical equipment. The newer emerging type of lithium–sulphur batteries promises the highest performance-to-weight ratio. Liion batteries present a high efficiency and a long lifespan. The technology is still under development, therefore further performance improvements may be expected in the future. In January 2017, Tesla Motors began production of lithium-ion battery cells for energy storage at its Giga factory in Nevada. The high-performance cylindrical "2170" cell, jointly designed by Tesla and its Japanese partner Panasonic, will be used in Tesla's Power pack 2 and Power wall 2. In 2018, it is expected to be used for its Model 3 electric vehicles as well.

Flow batteries

Flow batteries are considered unique in that the power and energy of the battery are entirely decoupled. A flow battery is consists of multiple electrochemical cells connected in series in a stack. These stacks are then connected in series and/or stacks to form a Flow Battery Energy Storage System (FBESS). The stack configuration dictates the power of the cell while the energy is controlled by the chemical energy contained in the electrolyte tanks that are external to the stack. Positive and negative electrolyte solutions are pumped into the stack where they are separated by ion-exchange membranes or a porous separator. Ion exchange (accompanied by flow of electric current) occurs through the membrane while both liquids circulate in their own respective space. There are several types of flow batteries such as Fe-Cr, Fe-V (vanadium 10 redox) and hybrid flow systems such as Zinc-Bromide (Zn-Br2) and Zinc-Chloride (Zn-C12). These are typically aqueous based solutions, and thus cell voltages are limited between 1.0 to 1.8 volts to prevent hydrolysis of the water. Non-aqueous electrolyte flow battery systems have the potential for higher energy density due to high open circuit voltage and a potential for more than 1 electron per mole of the active species. However, these are still under development. Currently, the most cost effective flow battery that exhibits good performance and safety is the all vanadium redox flow battery. Since the power and energy of the flow battery are separate, specialized cost performance models are required to determine the optimal energy to power stations for grid storage applications. Flow batteries are analogous to a fuel cell to the extent that reactants flow past or through the electrodes. The conversion is less than 100% per pass. Flow batteries have several technical advantages over conventional rechargeable batteries, but a monitoring and control mechanisms is required. Flow batteries are inherently safe as the aqueous electrolyte is non-flammable. Flow batteries are most cost effective for longer duration, energy intensive applications. However, they do retain their ability to do fast ramp rates. This enables them to provide multiple power and energy services. This operational flexibility makes the flow battery very attractive for grid scale applications.

Sodium–sulphur batteries

A sodium–sulphur (NaS) battery is a molten-salt battery constructed from liquid sodium (Na) and sulphur (S). NaS batteries are fabricated from inexpensive materials, which form one of the main advantages of this technology type. NaS batteries have high energy density, high efficiency of charging/discharging (89–92%) and long cycle life. The main drawbacks of the NaS battery are the operating temperatures of 3000C to 3500C and the highly corrosive nature of the sodium polysulphides. Battery cells become more economical with increasing size, therefore NaS batteries are considered more suitable for stationary energy storage applications. Typical applications of NaS batteries are distribution network support and grid services and renewable energy integration. The technology has a great potential for grid services since it has a long discharge time and can respond precisely to improve power quality issues in the grid.

Sodium-nickel-chloride batteries

Sodium-nickel-chloride (NaNiCl2) is high-temperature batteries similarly to NaS batteries. Their operating temperature lies within the 2700 C-3500 C range. During the charging process, salt (NaCl) and nickel (Ni) are transformed into nickel-chloride (NiCl2) and molten sodium (Na). The process is reversed during discharge. Typical applications of NaNiCl2 batteries are grid support services and renewable energy integration.

Electric Double layer Capacitors

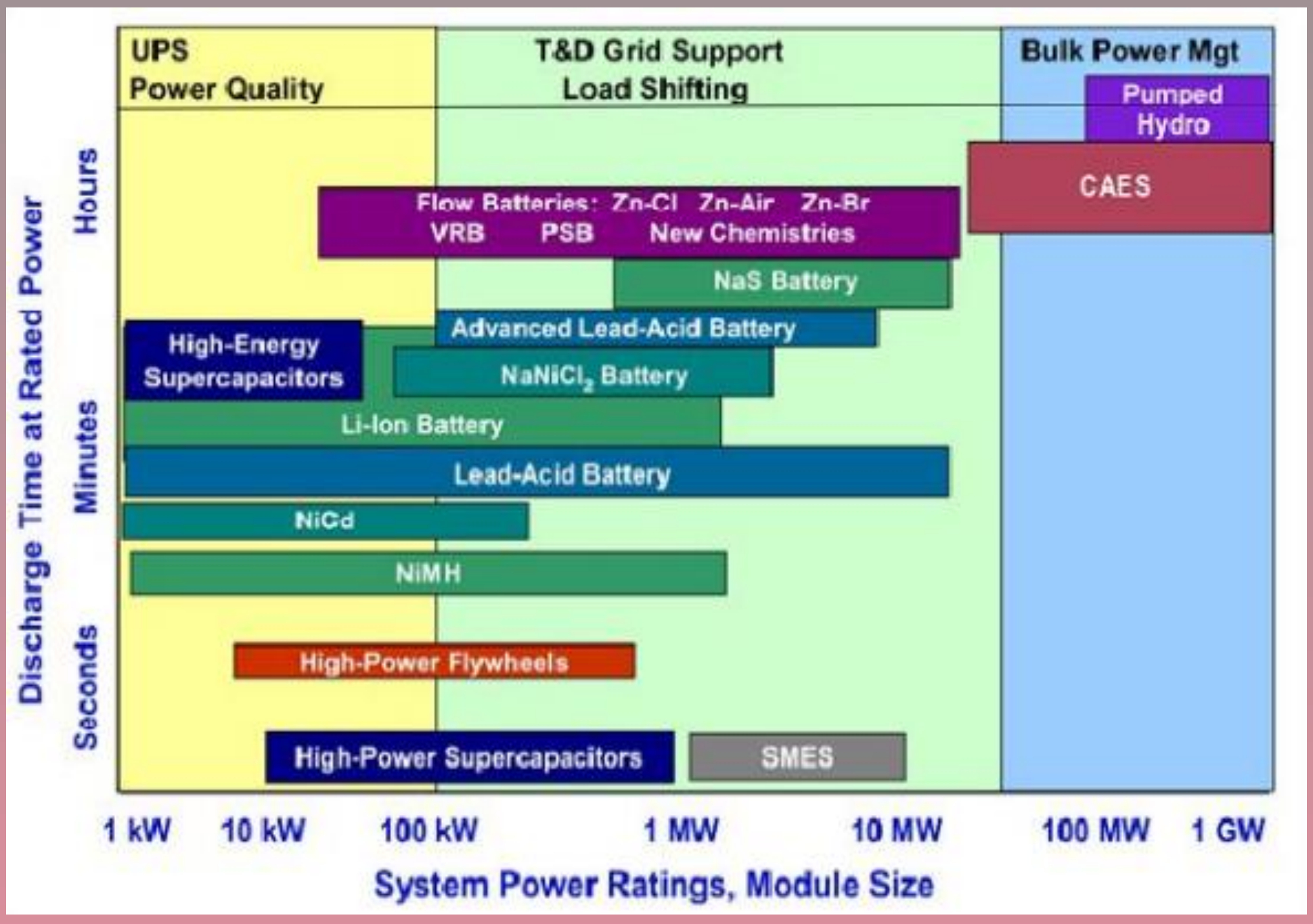
Electric Double Layer Capacitors (EDLCs), also known as “ultra capacitors” or “super capacitors” store electrical charge in an electric double layer (non-Faradic) at the interface between a high-surface-area carbon electrode and a liquid electrolyte. This mechanism is highly reversible and therefore just as with ECs, conventional capacitors, can be charged and discharged at high power rates with low capacitance fades for hundreds of thousands of cycles. The electrode surface area in capacitors determines the capacitance and thus, the energy storage capability of the device. The amount of energy stored by EDLCs is very large compared to conventional capacitors because of the use of a porous carbon-based electrode material of high surface area. While ultra capacitors have very high specific power (10-20 kW/kg), and longer lifetime relative to batteries, they have a low specific and volumetric energy density (95%), high power density and long calendar and cycle life. Deployment of EDLCs has accelerated greatly over the last 15 years; they are now widely commercialized in hybrid bus, rail, and automotive applications, as well as back-up power applications such as wind pitch control systems and uninterrupted power supplies. Moreover, there are several trials and pilot projects that study the utilization of super capacitors for grid energy storage systems. They can be a stand-alone technology or hybridized with a second, low cost high energy density technology such as flow batteries or high energy Li-ion batteries.

Comparison of battery storage technologies

A summary of the energy storage technologies discussed above is presented at table. Different types are compared by their main technical characteristics, such as cycle life performance and efficiency.

Storage technology	Cycle life at 80% DOD	Efficiency	Advantage	Disadvantage
Lead	Acid 300-3000	70-90%	✓ Inexpensive ✓ Mature technology	✓ Limited cycling capability for most standard types ✓ Low energy density ✓ Environmental hazard
NiCd	3000	80%	✓ Good cycle life ✓ Good performance at low temperatures ✓ More tolerant to hostile environments or conditions	✓ Memory effect ✓ High self-discharge rate ✓ Environmental hazard
NiMH	2000	50-80%	✓ High energy density ✓ Good abuse tolerance ✓ Good performance at low temperatures	✓ Damage may occur with complete discharge ✓ High costs
Li-ion	3000	75-90 %	✓ High energy density ✓ Low self-discharge rate ✓ No memory effect	✓ Expensive although costs are decreasing ✓ Not safe depending on type
Flow batteries	2,000- 20,000	65-85 %	✓ - Scalability ✓ Lifespan not dependent on DOD	✓ - Need for electrolyte tanks ✓ High maintenance ✓ Complex monitoring and control mechanisms .
NaS	4500	89 %	✓ -High efficiency and cycle life ✓ Low cost battery materials ✓ High energy density	✓ High operating temperatures ✓ Temperature is to be maintained close to 300C which might affect battery performance ✓ Corrosive materials
NaNiCl2	1,500- 3,000	85-95 %	✓ Long cycle life ✓ High energy density	✓ High operating temperatures ✓ Thermal management requirement

In addition a conceptual classification of energy storage devices is shown in Fig. 2 in terms of their power and energy relationship and potential use-cases and applications focusing to grid services provision.



Energy storage technologies and their main applications

Conclusion

Companies deploy storage technologies for a number of different purposes. Coordinating and rearranging energy from diverse resources to optimize the overall production/operation cost is only one of the many applications of energy storage. Energy storage can also improve the quality of power through frequency regulation and provide an uninterruptible source of power for critical infrastructure and services. Energy storage using grid-connected electrochemical battery systems has widely been considered as a potential solution for seamless integration of renewable, improving grid flexibility, and enhancing grid reliability.

Traffic Pulse Technology

The Traffic Pulse network is the foundation for all of Mobility Technologies® applications. This network uses a process of data collection, data processing, and data distribution to generate the most unique traffic information in the industry. Digital Traffic Pulse collects data through a sensor network, processes and stores the data in a data center, and distributes that data through a wide range of applications. Unique among private traffic information providers in the U.S. , Mobility Technologies real-time and archived Traffic Pulse data offer valuable tools for a variety of commercial and governmental applications:

* Telematics - for mobile professionals and others, Mobility Technologies traffic information complements in-vehicle navigation devices, informing drivers not only how to get from point A to point B but how long it will take to get there â€” or even direct them to an alternate route.

* Media - for radio and TV broadcasters, cable operators, and advertisers who sponsor local programming, Traffic Pulse Networks provides traffic information and advertising opportunities for a variety of broadcasting venues.

* Intelligent Transport business solutions (ITS) - for public agencies, Mobility Technologies applications aid in infrastructure planning, safety research, and livable community efforts; integrate with existing and future ITS technologies and deployments; and provide data reporting tools.

ADITYA NATH
1601298115

E-PAPER Technology

Today’s electronic displays have ever more evolved to be more lightweight, efficient and clear. Yet the importance's of the paper have not diminished. We still prefer it to others for a variety of reasons including its readability, high contrast, convenient handling, minimum power requirement cost and stainless reading it offers. At the same time, electronic displays offer us a paperless environment and gadgets like PDAs, cell phones relieves us from carrying loads of paper for referring to information when required.

Electronic ink is a pioneering invention that combiners all the desired features of a modern electronic display and the sheer convenience and physical versatility of sheet of paper. E-paper or electronic paper is sometimes called radio paper or smart paper. It is many applications includes making of the next generation paper. Paper would be perfect except for one obvious thing: printed words can’t change. The effort is to create a dynamic high-resolution electronic display that’s thin and flexible enough to become the next generation of paper.

The technology has been identified and developed is well under way. Within five years, it is envisioned electronic books that can display volumes of information as easily as flipping a page and permanent newspapers that update themselves daily via wireless broadcast just as today’s books give people easy access to everyday information, tomorrow’s books will provide the same easy access to the dynamic data of the information age.

Electronic paper next generation displays are like technology breakthrough that design is of electronic devices have been waiting for. These ultra thin, flexible displays mark the beginning of a new era for battery powered information appliances such as PDAs, cell phones, pagers and hand-held computers. They deliver the readability of paper under virtually any condition, without backlighting. And electronic ink displays are persistent without paper, drawing current only when they change, which means batteries can be smaller and last longer.

Two companies are carrying our pioneering works in the field of development of electronic ink and both have developed ingenious methods to produce electronic ink. One is E-ink, a company based at Cambridge, Massachusetts in U.S. A. The other is Xerox doing research work at the Xerox’s Palo Atto Research Center. Both are being funded by big companies like Philips, Penguin books, Motorola, The Hearst Corporation, and Atta's Venture. These are the companies who believe that electronic paper does have a future.

AJHAR AHAMED KHAN
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Night vision technology

Night vision technology was developed by the US defense department mainly for defense purposes ,but with the development of technology night vision devices are being used in day to day lives. In this seminar of mine I wish to bring out the various principles of working of these devices that have changed the outlook both on the warfront and in our common lives. Night Vision can work in two different ways depending on the technology used. 1.Image enhancement- This works by collecting the tiny amounts of light including the lower portion of the infrared light spectrum, those are present but may be imperceptible to our eyes, and amplifying it to the point that we can easily observe the image. 2:Thermal imaging- This technology operates by capturing the upper portion of the infrared light spectrum, which is emitted as heat by objects instead of simply reflected as light. Hotter objects, such as warm bodies, emit more of this light than cooler objects like trees or buildings.

SUVENDHU PATEL
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Blue Tooth

Blue Tooth

Bluetooth wireless technology is a cable replacement technology that provides wireless communication between portable devices, desktop devices and peripherals. It is used to swap data and synchronize files between devices without having to connect each other with cable. The wireless link has a range of 10m which offers the user mobility. There is no need for the user to open an application or press button to initiate a process. Bluetooth wireless technology is always on and runs in the background. Bluetooth devices scan for other Bluetooth devices and when these devices are in range they start to exchange messages so they can become aware of each others capabilities. These devices do not require a line of sight to transmit data with each other. Within a few years about 80 percent of the mobile phones are expected to carry the Bluetooth chip. The Bluetooth transceiver operates in the globally available unlicensed ISM radio band of 2.4GHz, which do not require operator license from a regulatory agency. This means that Bluetooth technology can be used virtually anywhere in the world. Bluetooth is an economical, wireless solution that is convenient, reliable, and easy to use and operates over a longer distance.

The initial development started in 1994 by Ericsson. Bluetooth now has a special interest group (SIG) which has 1800 companies worldwide. Bluetooth technology enables voice and data transmission in a short-range radio. There is a wide range of devises which can be connected easily and quickly without the need for cables. Soon people world over will enjoy the convenience, speed and security of instant wireless connection. Bluetooth is expected to be embedded in hundreds of millions mobile phones, PCs, laptops and a whole range of other electronic devices in the next few years. This is mainly because of the elimination of cables and this makes the work environment look and feel comfortable and inviting.

ANKUR KUMAR SAHU
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RFID Based Door Access Control

RFID Based Door Access Control

The conception of entrance control is brought about by the mean of a card, a parallel card reader, and a control board that is amalgamated with the server.

This is a proximity card with a unique ID number incorporated in it. The card reader interprets the data and sends it to the control board, which is a microcontroller.

This microcontroller tests the legality of the data with the incorporated server, which abides the database. The attached server is uploaded with the details of the worker for that unique ID number.

The control board confirms whether the person is permitted to enter the precise door or not. If the worker is genuine, then the person is permitted to enter the door.

The workers can be allowed in a particular doorway as per the designation. The entry control is used at this end.

RFID technology employs frequencies inside the range of 50 kHz to 2.5 GHz. An RFID mechanism usually comprises the following constituents:

- An RFID device that encloses data
- An antenna employed to broadcast the RF signals amid the reader and the RFID machine
- An RF transceiver that produces the RF indications

A reader that collects RF broadcasts from an RFID machine and passes the data to the host system for further action.

BISWARANJAN KUANAR
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Automatic Solar Tracker

The automatic solar tracker begins to follow the SUN exactly from sunrise, all through the day, till sunset and begins the work all over again from sunrise the next day. On hazy weather day, it lingers motionless and grasps the SUN yet again as it peeps out of clouds. It does all this mechanically, by employing inexpensive and economical constituents, and is extremely accurate. Let us make out how all this is done.

Automatic Solar Tracker

There are 3 Electronic sections to be elucidated. First is the parallel sensor section. It makes use of the 555 timer IC in the mono-stable approach. Pin 2 or trigger pin of 555 is hooked up with a power separator network. Pin 4 which can be reset is hooked up with an extra power separating network.

SAAHIN BAGH
1801298271

Cell Phone Operated Land Rover

Cell Phone Operated Land Rover

Traditionally, wireless controlled robots make use of RF (radio frequency) circuits, which have their disadvantages of restricted operational range, limited frequency range, and limited control. This project introduces the use of the mobile phone for robotic control. This technology is more controller friendly as it doesn't interfere with other controllers and can use up to twelve controls. It also has the advantages of robust control and provides working range as large as the coverage area of the service provider. Although the look and capabilities of these robots vary, they share mechanically movable structures under some form of control.

The robots are controlled in three phases namely reception, processing, and action. Here preceptors are sensors mounted on the robot and the processing is done by on-board microcontroller or processor. This robot works either with the help of motors or with some other actuators.

The robot is controlled by making a call on the mobile phone attached to the robot. In the course of the call if any button is pressed a 'dual-tone multiple-frequency' (DTMF) tone is heard at the other end of the call. The cell phone mounted on the robot perceives this tone and then the robot processes it by the ATmega16 microcontroller with the help of DTMF decoder MT8870.

JYOTIRMAYA SAHOO
1801298165

Wireless Control Of Robotic Arm

Wireless Control Of Robotic Arm

The main aim of the robotic arm project is by employing the rf-FSK method to control the robotic arm. The principles mainly employed to develop in designing the industrialized applications which are supple and simply improved to use in the near future.

There is a big issue in a number of industries where a human being cannot toil. This is because the temperature of the industrial room is more than a temperature that is suitable for human working. In order to conquer the difficulty of high-temperature wireless control, the robotic arm was designed. This robotic arm is brought into play for working in those circumstances where human beings cannot work and also the robotic arm can be controlled by bringing into play wireless method which is in trendy these days. The wireless method employed in our assignment is rf-FSK. This robotic arm circuit is interfaced with a microcontroller (P89C51R2), keypad, and Motors. The motors are connected with each other creating a robot's arm which is again interfaced with a panel enabled with keys to control.

INOJ DAS
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EVENTS POINT

Student Farewell~2015-2019 Batch
16/MAR/2019

Indian Engineering Teachers Association
Odisha Chapter on 23-3-19

Gamex 2k19

Annual Day Meet
~Lellihan 2019~
09/MAR/2019

STUDENT ACHIEVEMENT

Sl.No.	Name of the Student	Year of Study	Date/Place of Event	Event	Achievement
01	Santanu Pal	2015-2019	GIFT BBSR	Annual Day Event-Lelihan 2018	2nd prize in duet Dance
02	Krushna Chandra Nayak	2016-2020	GIFT BBSR	Annual Day Event-Lelihan 2018	2nd prize in duet Dance
03	Sarada Priyadarsini Moharana	2015-2019	GIFT BBSR	Annual Day Event-Lelihan 2018	2nd prize in solo dance
04	Ritesh Borah	2016-2020	GIFT BBSR	Annual Day Event-Lelihan 2018	3rd prize in Duet Song
05	Pinaki Prasdad Nayak	2015-2019	GIFT BBSR	Annual Day Event-Lelihan 2018	2nd prize in painting
06	Shreehari Sahoo	2018-2022	GIFT,BBSR	Annual Day Event-Lelihan 2019	2ND PRIZE IN Mano Action
07	Dular Gope	2016-2020	GIFT,BBSR	Annual Day Event-Lelihan 2019	1st Prize in Quiz
08	Sushil Kumar	2016-2020	GIFT,BBSR	Annual Day Event-Lelihan 2019	2nd Prize in Quiz
09	Sujan Mandal	2016-2020	GIFT,BBSR	Annual Day Event-Lelihan 2019	1st Prize in Guitar
10	Tanmay Kumar Mallick	2018-2022	GIFT,BBSR	Annual Day Event-Lelihan 2019	3rd prize in Painting
11	Chinmaya Kumar Nayak	2018-2022	GIFT,BBSR	Annual Day Event-Lelihan 2019	2nd prize in painting
12	Ritik Roshan Das	2017-2021	GIFT,BBSR	Annual Day Event-Lelihan 2019	2nd Prize in Duet Song
13	Ritesh Borah	2016-2020	GIFT,BBSR	Annual Day Event-Lelihan 2019	1st Prize in Duet Song

GLIMPSES @ GLANCE

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