ELECTRICAL INSTALLATION ENGINEER

NEWS LETTER

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EDITORIAL

Dear Members, Fellow Professionals and Friends

Greetings For A Happy And Safe Deepavali!!

The Happenings around are always a mixture of 'Sweet and Sour', 'Good and not so Good' and so on, but in totality, we seem to have a lot to cherish and work for. In spite of all odds, progress in our Country has been quite remarkable, just over the span of past 50 years. Though it is a little slow but it has been steady. History and Economic Researches by the World experts are the proof for the Great and Glorious position India has held for centuries, till about 200 years ago, and the present rate and potentials for growth indicate that we are marching ahead to regain our Leadership position.

We just completed celebration of "Ayudha Pooja" early in the month reflecting our age old culture of 'Work is Worship' and the "Exhibition of Reverence for the Machines and Tools". It is very apt that last month, Prime Minister of India launched the most ambitious project, "Make in India". This initiative is the latest and the most expansive of the attempts to revive the country's manufacturing sector to increase manufacturing growth to double digits that would enable the share of manufacturing in the country's GDP to reach 25% and more. Another important purpose of this Project is to create millions of employment opportunities.

Another Pride for us is the success story of the Mars Orbiter Mission (MOM), also called *Mangalyaan* ("Mars-craft" from Sanskrit *mangala*, "Mars" and *yâna*, "craft, vehicle"), and the mission is a "technology demonstrator" project to develop the technologies for design, planning, management, and operations of an interplanetary mission. It was reported in the Press recently that the US expressed regret for having grossly under estimated India's capability.

We just remembered Mahathma Gandhi on his Jayanthi on the 2nd October and the PM, on that day launched the project, one of the biggest ever, cleanliness drive, the Swachha Bharat Abhiyaan from Rajpath, New Delhi. Millions of people across the country took pledge of cleanliness in various public functions on Gandhi Jayanthi day as part of the 'Clean India' campaign. Some of the utterances by the PM on the occasion, like, trust Mahatma Gandhi's devotion and dedication to cleanliness and Swachha Bharat: Invite people to clean up along with you: This work is the responsibility of the people of India: It's a very difficult task, but If Indians can reach Mars with a minimum amount of expenditure, can Indians not pledge to uphold cleanliness:, deserve complete understanding and total involvement.

We thank all those members who have helped us by participating in the advertisements appearing for the issue September 2014 – Velohar Infra Pvt Ltd, Emaar Electricals, Devee Electricals, Power Links, Heat Craft Engineers Pvt Ltd., Wilson Power and Distribution Technologies Pvt. Ltd., Max Electric Co., Faith Power Solutions, Abirami Electricals, FLIR Systems India Pvt. Ltd., Galaxy Earthing Electrodes Pvt. Ltd., Cape Electric Pvt. Ltd., RSP Electric Co., Universal Earthing Systems Pvt. Ltd., EVR Electricals Pvt. Ltd., Elmeasure India Pvt. Ltd., Ashlok Safe Earthing Electrode Ltd., Electrotherm (India) Ltd., Sri Bhoomidurga Marketing (P) Ltd., Vie Soleil Engineers Pvt. Ltd. ***EDITOR***

CONGRATULATIONS

It is indeed a great honour that our Association **Vice President Mr. S.D. Poongundran, M/s. Sudhan Power Tech, Cuddalore** has been nominated as Syndicate Member of Annamalai University.

He represents the Public or Private sector industries and research institutions having special knowledge and practical experience in Industry and Commerce Category.

He has been nominated by the Chancellor on the recommendation of Tamilnadu Government.

We extend our heartiest Congratulations to you as a Syndicate Member and wishing you a successful mission

Members of TNEIEA & EDITOR

Powers of Syndicate in brief

Group of Syndicate Members shall be eligible to make Statutes, Ordinances, to Institute Professorship, to Institute Degrees, Confer Degrees, to Confer Honorary Degrees, Institute Fellowships, to determine fees to be charged etc.

ELECTRICAL INSTALLATION ENGINEER

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190.	Welwin Electricals, *Sriperumbudur*	EA 2792	Kanchipuram	044-27162310, 98421 55520
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EVENTS

Asia Clean Energy Summit

Event Profile: Asia Clean Energy Summit (ACES) is Asia's leading event focusing on clean energy technology, policy and finance. It is supported by leading government agencies, research institutes and industry in Singapore. ACES provides a common platform for regional thought leaders in both the public and private sector to collaborate on critical issues and opportunities in harnessing clean energy for the future.

Date: 28th 29th Oct 2014

Venue: Sands Expo and Convention Centre, Singapore

Website: http://www.asiacleanenergysummit.com/

Event Profile: The 6th edition of-"India Nuclear Energy 2014" 6th International Exhibition and Conference will be held from 6th to 8th November 2014 at Nehru Center, Worli, Mumbai. India Nuclear Energy 2014 is co-partnered by Department of Atomic Energy(DAE), the nodal Government body in the Indian Nuclear Energy sector and Supported by Indian Nuclear Society (INS)The event will cover various aspects of nuclear energy and power.

Date: 6th 8th November 2014

Venue: Nehru Center, Worli, Mumbai, India

Website: http://www.ubmindia.in/indianuclearenergy/home

Events Profile: Intersolar India is India's largest exhibition and conference for the solar industry and, as a leading industry platform, focuses on the areas of photovoltaics, PV production technologies, energy storage and solar thermal technologies. In 2013, a total of 170 companies from 14 countries attended the exhibition.

Date: 18th 20th November 2014

Venue: Mumbai, India

Website: http://www.intersolar.in/en/intersolar-india.html

Date: 14th 16th January 2015

Venue: Tokyo Big Sight, Japan

Website: http://www.design-lighting.jp/en/

Events Profile: DESIGN LIGHTING TOKYO is a venue for business meetings between exhibitors and visitors. Design lightings that enrich the atmosphere will be showcased and plenty of users as architects, designers, etc. that seek stylish design lightings will gather here in Tokyo.

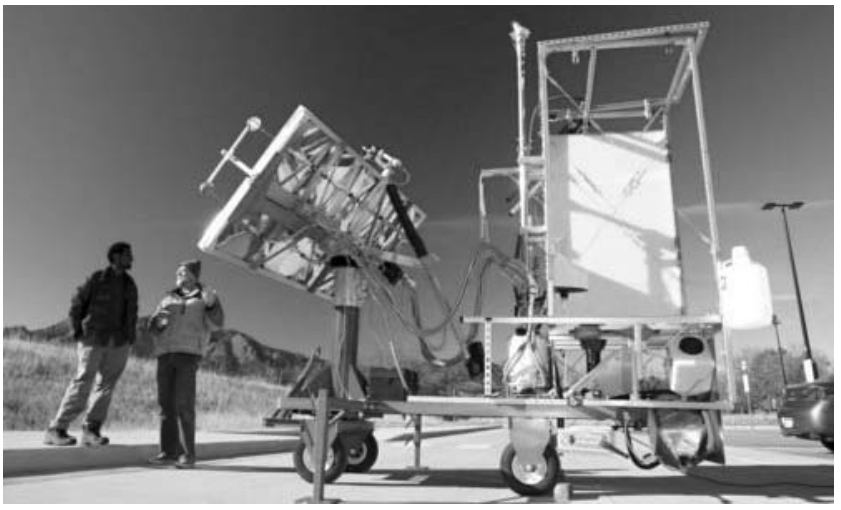
Events Profile: Featuring live, life size experience walk-through pavilions conceptualized and designed by a technical committee from IEEE and IEEMA & supported by leading ecosystem players

Date: 22nd 24th January 2015

Venue: Bombay Exhibition Centre, Mumbai, India

Website: http://www.ii-intelect.org/

INNOVATIVE SOLAR-POWERED TOILET DEVELOPED BY CU-BOULDER READY FOR INDIA UNVEILING



A revolutionary University of Colorado Boulder toilet fueled by the sun that is being developed to help some of the 2.5 billion people around the world lacking safe and sustainable sanitation will be unveiled in India this month.

The self-contained, waterless toilet, designed and built using a $777,000 grant from the Bill & Melinda Gates Foundation, has the capability of heating human waste to a high enough temperature to sterilize human waste and create biochar, a highly porous charcoal, said project principal investigator Karl Linden, professor of environmental engineering. The biochar has a one-two punch in that it can be used to both increase crop yields and sequester carbon dioxide, a greenhouse gas.

The project is part of the Gates Foundation's "**Reinvent the Toilet Challenge**", an effort to develop a next-generation toilet that can be used to disinfect liquid and solid waste while generating useful end products, both in developing and developed nations, said Linden. Since the 2012 grant, Linden and his CU-Boulder team have received an additional $1 million from the Gates Foundation for the project, which includes a team of more than a dozen faculty, research professionals and students, many working full time on the effort.

According to the Gates Foundation, the awards recognize researchers who are developing ways to manage human waste that will help improve the health and lives of people around the world. Unsafe methods to capture and treat human waste result in serious health problems and death – food and water tainted with pathogens from fecal matter results in the deaths of roughly 700,000 children each year.

Linden's team is one of 16 around the world funded by the Gates "Reinvent the Toilet Challenge" since 2011. All have shipped their inventions to Delhi, where they will be on display March 22 for scientists, engineers and dignitaries. Other institutional winners of the grants range from Caltech to Delft University of Technology in the Netherlands and the National University of Singapore.

The CU-Boulder invention consists of eight parabolic mirrors that focus concentrated sunlight to a spot no larger than a postage stamp on a quartz-glass rod connected to eight bundles of fiber-optic cables, each consisting of thousands of intertwined, fused fibers, said Linden. The energy generated by the sun and transferred to the fiber-optic cable system — similar in some ways to a data transmission line — can heat up the reaction chamber to over 600 degrees Fahrenheit to treat the waste material, disinfect pathogens in both feces and urine, and produce char.

"Biochar is a valuable material," said Linden. "It has good water holding capacity and it can be used in agricultural areas to hold in nutrients and bring more stability to the soils." A soil mixture containing 10 percent biochar can hold up to 50 percent more water and increase the availability of plant nutrients, he said. Additionally, the biochar can be burned as charcoal and provides energy comparable to that of commercial charcoal.

Linden is working closely with project co-investigators Professor R. Scott Summers of environmental engineering and Professor Alan Weimer chemical and biological engineering and a team of postdoctoral fellows, professionals, graduate students, undergraduates and a high school student.

"We are doing something that has never been done before," said Linden. "While the idea of concentrating solar energy is not new, transmitting it flexibly to a customizable location via fiber-optic cables is the really unique aspect of this project." The interdisciplinary project requires chemical engineers for heat transfer and solar energy work, environmental engineers for waste treatment and stabilization, mechanical engineers to build actuators and moving parts and electrical engineers to design control systems, Linden said.

Tests have shown that each of the eight fiber-optic cables can produce between 80 and 90 watts of energy, meaning the whole system can deliver up to 700 watts of energy into the reaction chamber, said Linden. In late

December, tests at CU-Boulder showed the solar energy directed into the reaction chamber could easily boil water and effectively carbonize solid waste.

While the current toilet has been created to serve four to six people a day, a larger facility that could serve several households simultaneously is under design with the target of meeting a cost level of five cents a day per user set by the Gates Foundation. “We are continuously looking for ways to improve efficiency and lower costs,” he said.

“The great thing about the Gates Foundation is that they provide all of the teams with the resources they need,” Linden said. “The foundation is not looking for one toilet and one solution from one team. They are nurturing unique ideas and looking at what the individual teams bring overall to the knowledge base”.

Linden, who called the 16 teams a “family of researchers,” said the foundation has funded trips for CU-Boulder team members to collaborate with the other institutions in places like Switzerland, South Africa and North Carolina. “Instead of sink or swim funding, they want every team to succeed. In some ways we are like a small startup company, and it’s unlike any other project I have worked on during my career,” he said.

CU-Boulder team member Elizabeth Travis from Parker, Colo., who is working toward a master’s degree in the engineering college’s Mortenson Center in Engineering for Developing Communities, said her interest in water and hygiene made the Reinvent the Toilet project a good fit. “It is a really cool research project and a great team,” she said. “Everyone is very creative, patient and supportive, and there is a lot of innovation. It is exciting to learn from all of the team members”.

“We have a lot of excitement and energy on our team, and the Gates Foundation values that,” Linden said. “It is one thing to do research, another to screw on nuts and bolts and make something that can make a difference. To me, that’s the fun part, and the project is a nice fit for CU-Boulder because we have a high interest in developing countries and expertise in all of the renewable energy technologies as well as sanitation”.

The CU-Boulder team is now applying for phase two of the Gates Foundation Reinvent the Toilet grant to develop a field-worthy system to deploy in a developing country based on their current design, and assess other technologies that may enhance the toilet system, including the use of high-temperature fluids that can collect, retain and deliver heat.

See more at: http://www.colorado.edu/news/releases/2014/03/12/innovative-solar-powered-toilet-developed-cu-boulder-ready-india-unveiling#sthash.c8QIJfUT.dpuf

EUROBIKE TO SHOWCASE FIRST HYDROGEN FUEL CELL E-BIKE

A look at Electrolyte’s 300-mile range e-bike

German electric bike maker Electrolyte is to debut what it says is the world’s first cartridge hydrogen fuel cell electric bike at Eurobike next week.

Having formed a partnership with one of the companies at the forefront of hydrogen fuel cell production, Electrolyte have come up with the Vorradler S3 FC, which the firm claims is capable of 300 power assisted miles.

In addition to the Vorradler, Electrolyte has a range of ebikes that include 20-inch folders, 36 volt belt-driven cruisers with both front and rear-mounted torque sensor hub drives and an ‘unplugged series’ of urban commuters offering riders a town bike which has been developed for low-maintenance comfortable riding.

Another string to Electrolytes bow is it’s custom-built road bikes. Riders can build their bike from the bottom up, starting with frame material (titanium or steel) geometry, componentry and finish.

“Expecting the world to treat you fairly because you are a good person is a little like expecting a bull not to attack you because you are a vegetarian”

KNOW THY POWER NETWORK - 85

Let us restart our journey from the point where we left in the last month.

To start with, let me share a saying about ***"Security"****. "There is no such thing as* ***"Perfect Security"*** *or* ***"Error – Free Security"****; only varying levels of insecurity exist.* You can call any security level as less insecure, moderately insecure and highly insecure. This explanation of security holds good for "Cyber Security" also. What we desire is that "**Very high levels of security"** or **"Less insecure levels"** should be maintained for our **"Smart Grid"**. You all know that a very high level of Cyber Security is essentially required for the critical monitoring of physical power system and to control and also the storage of highly confidential consumer information.

The communication media for AMI systems include a variety of radio systems, common carrier digital cellular services, and carrier communication using the power line itself (in the form of Broad Band over power lines). Of these the use of wireless is widely used. It is a part of the standard series that consists of Ethernet, Wi-Fi, WL Max and Zig Bee. Increased functionality and wireless connectivity brings in their wing a heightened demand for the security and protection of the system and its manage integrity and the preservation of confidential information of customers. Therefore best practice guidelines are to be followed for the security of AMI systems.

Among the techniques used to achieve cyber security, the modern layered communication protocols is appeared to be the best. It helps the separation of physical media, addressing security features and application specifications. This network can mix multiple physical media to meet application needs without sacrificing inter operability. It can also share common addressing methods to simultaneously transport messages from multiple application layer protocols. To achieve higher security of the messages, encryption of the messages by adopting appropriate, encryption codes is required. This kind of security level is called "Upper Layer Security".

From the studies made so far, we have learnt that cyber security is an important aspect of Smart Grid System and such security requirements are to be met fully from the beginning of the project itself. It should be based on the business needs of a particular application and also the environment in which it resides. The security thus selected should meet the requirements of better performance, reliability and the communication needs of the systems on which it is employed. It should also have higher levels of confidentiality, integrity and availability.

Now let us revisit our site containing useful information on "Smart Items". Among other things, I would like to discuss the topics like Smart chopsticks. Smart Neurons, Smart Pets and Smart City.

I SMART CHOPSTICKS

These smart electronic devices will help the consumers whether the food placed in front of them is safe to eat or contain some harmful substances. The sensors in the implements aid this process and flash their findings on the Smart phone or other Smart devices used by the consumers.

II SMART NEURONS

These neurons exist in our body skin only; they are equal to brain, if not more, when their "Smart" activities are compared. These neurons can crack complex calculations. The smart neurons in the human skin can not only send signals to the brain (e.g) (that some thing has touched the skin) but also process and provide the geometric data about the object that touched it. These smart neurons are called first order neurons in the tactile system and they complete their analysis even before the signals transmitted to the brain for processing.

III SMART PETS

These smart pets are in no way related to our soft furry friends like dogs, cats and birds. *They are "Virtual Pets" which appear in our desk-top computers or mobile phones*. They are quite popular among youngsters and are also great stress-busters. Among these electronic cutee's are pet dogs, cats, horses, dragons and aliens. Do you want to know the names of some of the most popular virtual pet apps? Then make your pick.

Talking Pierre - the parrot; Aqua pet; My talking tom; Ploy; Unicorn pet; Tiny farm

IV SMART CITY- (Picture Refer Page no. 13 - Next page)

When we deal with so many smart items, lest we forget our "Smart City"? Our government have planned to build 100 Smart cities in the near future, when the "Smart City" concept is gaining momentum, there is an urgent need for us to have a "Simple View" of Smart City and its characteristic features . Am I wrong? Then understand what city is this city and what can we expect from a Smart City?. No doubt, we can expect safe drinking water, good sewerage management, use of recycled water, solid waste management and other environmentally friendly activities, in addition to digital connectivity and good communication. All aspects of food, water and energy conservation and security will be also taken care of. There can be no doubt about the prevalence of technologically based governance, efficient public services and transports, 24x7 water and electricity supply 100%. Sewerage and drainage facilities besides a world class infrastructure. In short, what all you anticipate / expert in a clean technical city will be provided / made available in our smart city. It is a city typically runs overwhelmingly on latest technology - be it on electricity, water or commuting or security. But all these are performed with minimum human intervention. The core of this Smart city's infrastructure / build up lies in the modern information technology, where a network of sensors, cameras, wireless devices, data centres form the key infrastructures providing essential services, use of environmentally friendly building materials and energy efficient devices / equipment are also factors connected with it.

When we expect so much of modern facilities in a Smart City, can we falter on our "Civic Side". *It is because the civic sense of our people is "Very Poor"*. We always lag behind the developed nations on this aspect. Then it is must for us to build up our mental structures properly. There should be frequent awareness and other programmes to lift up our civic morality and civic sense. This will help us to maintain our Smart Cities in a clean status sustainably. Then we can proudly proclaim ourselves as "True Citizens". Kindly judge whether I am correct in my statement or of exceeding your expectations!

Let us stop here.

Good bye until I meet you all next month.

(To be continued…)

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SMART CITY


Environment-friendly design buildings
Regional EMS (Control center)
Smart Buildings linked through Regional EMS
Wind farm
Battery storage systems
Next-generation vehicle center(operation center)
Intelligent Transportation System (ITS)
MegaSolar
Smart House
Biomass fuels
Multi-energy station
EV car sharing
EV car sharing
Smart House
Electric bus
Smart House
Solar panel
Small / Medium-scale Smart Buildings
Offshore wind farm
Multi-energy station

INDIA'S FIRST PLANT THAT RECYCLES CONSTRUCTION WASTE

Over the last five years, India's first and only recycling plant for construction and demolition (C&D) waste has saved the already-polluted Yamuna and the overflowing landfills of Delhi from 15.4 lakh tonnes of debris.

A Ministry of Urban Development circular on June 28, 2012, directed States to set-up such facilities in all cities with a population of over 10 lakh. But, till now the existing facility at Burari is the only one.

In the past few months, efforts are on to increase the plant's production, as well as set up more facilities to reduce the amount of waste dumped at landfills. The erstwhile unified Municipal Corporation of Delhi (MCD) had started the plant in 2009, with Infrastructure Leasing & Financial Services (IL&FS) operating the 10-acre site at Burari at Jahangirpuri in North Delhi.

A meeting of the North Delhi Municipal Corporation's Standing Committee on Thursday approved the waste collection contract with IL&FS till 2019 and sanctioned Rs. 23 crore for the expenditure on transporting the materials to the plant. Members of the committee visited the plant on Wednesday.

With near-constant buzz of construction activity across the Capital, 5,000 tonnes of waste is produced by building, demolition and land-clearing activities every day. Though the plant was set up with 500 tonnes per day (TPD) capacity, it has more than doubled today.

"We are processing 1,200 TPD of waste currently. Last month, the Delhi Pollution Control Committee gave us permission for expanding to 2,000 TPD," said IL&FS vice-president (operations) Sanjay Singh.

As of now, most of the C&D waste produced in Delhi ends up being dumped along the Yamuna or in the Ridge area. Making recycling difficult, it is usually mixed with municipal solid waste.

The IL&FS facility gets mixed C&D waste from 28 designated points in three zones of the North Corporation, which pays for transportation. The civic body collects and transports the waste to the plant from the remaining of the areas.

Once at the plant, the waste is segregated into big concrete pieces, mixed C&D waste as per size and unrecyclable materials like plastic and wood, which are sent to a waste-to-energy plant in Okhla.

The plant uses manual segregation for bigger plastic pieces as well as a magnetic separator for metallic objects.

The waste is crushed, washed and used to make ready-mix concrete, kerb stones, cement bricks, pavement blocks, hollow bricks and manufactured sand.

Over the years, Mr. Singh said, the process has been tinkered with as the amount of sand in the mixed waste has increased.

"We had to put in place a wet processing unit so that the sand doesn't fly around. We started using equipment used in the mining industry," he added.

IL&FS senior technical advisor N.B. Mazumdar added: "In dry processing, there is 40 per cent to 50 per cent of rejects, but with wet processing we have brought the reject ratio to five per cent to 10 per cent".

Not only does the plant reduce the load at landfills, it is also better for the environment as it uses treated effluent supplied from the Delhi Jal Board.

"We get about 10 to 12 tankers of treated effluent every day for the washing process and even that water we recycle and use again," explained Mr. Singh, adding that the plant was a "zero-discharge facility".

Officials in the North Corporation are hoping that the capacity of the plant can be increased and the C&D waste in the remaining three zones can also picked up by IL&FS. Standing Committee chairperson Mohan Bhardwaj said such facilities should be encouraged as they can help control Delhi's garbage problem.

"We are ready to buy the products made at the plant once standards have been put in place," Mr. Bhardwaj said in reference to the recycled construction material, which is currently only sold to private individuals and builders, and not government departments.

A committee set up to look into BIS regulations is likely to include C&D aggregate in its policy within a few months. Once the aggregate is allowed, the end-products will be used by government departments and larger builders.

Courtesy: The Hindu

SOLAR TRADE WAR: U.S. IMPOSES PRELIMINARY ANTI-DUMPING TARIFFS OF 26-165% ON SOLAR PV FROM CHINA, TAIWAN

The U.S. Department of Commerce has issued steep preliminary anti-dumping (AD) tariffs on solar products from China and Taiwan, which will add to substantial preliminary anti-subsidy (countervailing duty or CVD) tariffs imposed a month ago.

A number of Chinese PV makers were singled out for special duty rates, and among these Trina Solar got the lowest preliminary AD rate at 26.33%. However, to avoid double-counting of export subsidies, the effective combined AD and CVD duty rate for Trina is only 29.30%.

Other manufacturers did not get off so easily. A list of 42 companies including market leaders Yingli, Canadian Solar and Hanwha SolarOne were assessed at a 42.33% anti-dumping duty rate, for a combined AD/CVD tariff of 47.27%. The exception to this is Wuxi Suntech. While assessed at the same AD rate, the company received a higher CVD rate, and as a result importers of these modules must pay a combined AD/CVD tariff of 49.24%.

However, the highest rates are reserved for companies not on the list. Due to a ruling of "adverse facts" including non-cooperation with the investigation, companies not named in the investigation were assessed at a 165.04% AD rate, which makes for a combined AD and CVD rate of 191%.

Unlike 2012 tariffs, this set of AD and CVD tariffs includes both PV cells and modules made in China, and the anti-dumping investigation includes PV cells and modules made in Taiwan. AD rates for Taiwanese PV cell maker Gintech were set at 27.59%. For Motech these rates are 44.18%, and for all others 35.89%.

GTM Research says that it stands by the assessments made in an earlier report in terms of the impacts of these rates. "The tariffs in this case are so high as to prohibit basically any manufacturer from selling at a competitive price in to the U.S.," says GTM Research VP Shayle Kann.

Chinese PV module makers also have the option of using Chinese cells and simply paying the 2012 duty rates, as the current investigations exclude products covered by the 2012 tariffs.

The U.S. Department of Commerce's final AD ruling will be on or about December 16th, 2014, which will be followed by an International Trade Commission confirmation ruling on January 29th, 2014.

Read more: http://www.pv-magazine.com/news/details/beitrag/us-department-of-commerce-imposes-preliminary-anti-dumping-tariffs-of-26-165_100015851/#ixzz38jT2hidB

Science is built up of facts, as a house is built of stones; but an accumulation of facts is no more a science than a heap of stones is a house.
- HENRI POINCARÉ, Science and Hypothesis, 1905

THESE BATTERIES RECHARGE WITH WASTE HEAT

A new system developed by a team from Stanford and MIT takes excess heat and turns it into electricity.

As a country, more than half of what we spend on energy is going to waste, according to a report by the Lawrence Livermore National Laboratory.

One of the primary culprits is heat. Factories, such as steel mills, give off a tremendous amount of energy in the form of heat— but that heat almost always escapes into the atmosphere, where it can't do much good.

But a team of scientists working cooperatively between the Massachusetts Institute of Technology and Stanford University have developed a new type of battery that can help harness heat exhaust and funnel it back into the grid, taking advantage of a lesser-known principle called the thermogalvanic effect.

Until now, the majority of the research surrounding the conversion of waste heat has focused on thermoelectric power. Thermoelectric generators, for instance, have been growing in popularity over the last several years. The systems move electrons from the hot side of a conductive material, such as metal, to the cool side; once there, electrons can be converted to a current to power devices or charge a battery. The generators are used to power things like radio and telemetry systems on gas pipelines, as backup power sources for unmanned research sites, and even as the renewable power source on the Mars Curiosity rover.

The system is so well-known and well-researched that it's already being used in consumer-facing products, including the popular BioLite CampStove.

But, according to Yi Cui, an associate professor at Stanford who helped lead development on the new battery, thermoelectric generators can't adequately harvest energy from large plants and factories that don't run as hot as, say, a campfire.

The waste heat coming off a steel mill, for example, isn't hot enough (or the battery can't be cooled down enough) for a thermoelectric reaction to work.

Working closely with a team at MIT led by Gang Chen, a researcher with a deep background in thermoelectrics, Cui instead developed a battery designed specifically with so-called "low-grade" heat in mind.

The new concept is centered around a fairly standard water-based battery with a positive and negative electrode. The team placed an empty battery in an area with a lot of waste heat and then began to charge it. Once the battery was fully charged, they cooled it to room temperature, at which point it was discharged— and the cooled battery can discharge more energy than was put into it.

That's the thermogalvanic phenomenon at work.

"A change in temperature causes a change in free energy, and the wattage changes a lot," Cui says. In effect, the battery is taking on energy from the waste heat—otherwise wasted energy that could be fed back into the grid.

The batteries, unlike thermoelectric systems, cannot currently go entirely off-grid, since they require a direct current to charge. The idea is, though, that you'll need to draw less power from the grid to do it.

The team is still experimenting with how quickly it can heat and cool the batteries and how many times a cell can be cycled before it's spent. In the lab, it takes a couple of hours for the battery to complete one charge-discharge cycle. The team hasn't pushed any single cell through more than 50 cycles.

Right now, we don't have a clear sense of how much power a system like Cui's can produce. Cui eventually envisions a circuit of several cells that can be installed in a factory. As one cell's temperature rises from exposure to waste heat, another moves into the cooling cycle.

"Half of them are charging in a high temperature, and half of them are discharging in a low temperature," he says.

At the moment, the primary target is factory-produced waste heat, but Cui feels the system could be applied elsewhere in the future. The team may also experiment with other battery materials that might allow the thermogalvanic effect to be applied to higher heat levels, such as those produced by a fireplace or an oven.

Read more: http://www.smithsonianmag.com/innovation/batteries-charge-waste-heat-180951692/#bjjlmshfgcj0bki5.99

"A Gujarati didactic stanza likewise gripped my mind and heart. Its precept 'return good for evil' became my guiding principle. It became such a passion with me that I began numerous experiments in it". - GANDHI wrote, In his autobiography

TOSHIBA TO SUPPLY STEAM TURBINE AND GENERATORS FOR ONE OF WORLD'S LARGEST-CLASS GEOTHERMAL POWER PLANT PROJECTS

Toshiba Corporation recently announced that is has been awarded a major contract to supply 3 x 60-megawatt geothermal steam turbines and generators (STG) for one of the world's largest geothermal power plants, the Sarulla geothermal power plant project, which is now under construction in Tapanali Utara in Indonesia's North Sumatra.

Toshiba, the world's leading supplier of geothermal power generation equipment, was awarded the contract by Sarulla Operations Ltd. (SOL), a four-company consortium of Itochu Corporation and Kyushu Electric Power Co. Inc. of Japan, PT Medco Power Indonesia of Indonesia, and ORMAT International, Inc. of the U.S.A. The engineering, procurement and construction (EPC) contractor is Hyundai Engineering and Construction Co., Ltd. (HDEC). Toshiba will start to supply STGs to HDEC in July 2015, and the plant is scheduled to start operation in November 2016. Its output will account for approximately 1% of Indonesia's total power generation.

Indonesia has the world's second largest geothermal resources, a potential generating capacity of 28,000MW, but installed capacity to date is a low 1,300MW*1. With growth driving demand and shortfalls in supply, the Indonesian government is promoting geothermal power as a means to raise generating capacity and reduce reliance on oil, where demand outstripped local production in 2004. Government plans include IPP projects with a capacity of 12,000MW*2 by 2025, which the Japanese government is supporting through its yen loan program.

Toshiba, an industry leader in power generation equipment, has world-class capabilities in nuclear, thermal and renewable power generation equipment. The company entered the geothermal business in 1966 with the supply of an STG for the Matsukawa plant, Japan's first geothermal plant, and subsequently expanded into North **America**, Southeast Asia and Iceland. Today, Toshiba is the world leader in the manufacture of STGs, with a market share of 23%*3, and has supplied 52 units with an installed capacity of 2,800MW. In recent years, Toshiba's technological capabilities have supported order wins for geothermal STG in New Zealand, Kenya and Turkey.

Toshiba is highly familiar with the Indonesian market, where it is a leader in power generation equipment supply. The company's record to date includes 12 steam turbines and generators with a combined capacity of 4,200MW for four thermal power plants, including the Tanjung Jati B coal-fired thermal power plant; 26 hydroelectric turbines and generators with a combined capacity of 1,500MW for 11 hydroelectric power plants; and the Patuha Unit 1 project, a 55MW geothermal power plant now under construction in West Java.

Global geothermal power market continues to grow substantially, with new opportunities appearing around the world. By the end of 2013 the global geothermal market is expected to reach 12,000 MW*1 geothermal capacity. Countries with notable potential include the U.S., Indonesia, Japan, the Philippines, Mexico, Iceland, New Zealand and Italy. Toshiba will continue to participate in projects that promote environmentally-friendly, low carbon-dioxide renewables, including geothermal power.

Courtesy: Emaglive

CHINESE-MADE SOLAR PANELS HAVE TWICE THE CARBON FOOTPRINT OF EUROPEAN ONES, STUDY FINDS

A new joint study by the U.S. Department of Energy's Argonne National Laboratory and Northwestern University has discovered that solar panels made in China have a carbon footprint that is twice the size as those panels made in Europe.

A correspondent from Northwestern University said last week that after exhaustive research, they found that panels produced in China are "likely" to use substantially more energy during the manufacturing process when compared to panels produced in Europe.

"We estimated that a solar panel's carbon footprint is about twice as high when made in China and used in Europe, compared to those locally made and used in Europe," said Northwestern corresponding author of the paper (titled: *Domestic and overseas manufacturing scenarios of silicon-based photovoltaics: Life cycle energy and environmental comparative analysis*) and assistant professor of chemical and biological engineering, Fengqi You. "While it might be an economically attractive option to move solar panel manufacturing from Europe to China, it is actually less sustainable from the life cycle energy and environmental perspective – especially under the motivation of using solar panels for a more sustainable future".

A systematic life cycle analysis was employed by the research team in order to draw up hard data, analyzing the entire energy used in the production of a solar panel – including the energy consumed in mining the raw materials required; the fuel burned in transporting the materials and products; the electricity required to power the manufacturing plant, and so on.

The study looked at silicon panels installed in southern Europe, an area with high levels of solar irradiation. Once evaluated under the life cycle analysis, researchers concluded that a panel made in China but installed in southern Europe would take up to 30% longer to generate the electricity required in order to balance out the energy used to make it. The carbon footprint, meanwhile, was double that of a solar panel produced domestically in Europe (the study did not, however, take into account utility-scale savings, of which Chinese manufacturers may benefit, both economically and environmentally).

Lack of regulations

Despite solar PV's undoubted green credentials, environmental concerns do not often appear as high up the agenda as one might expect for solar companies. In China, too, environmental governance standards are poor or often non-existent, and manufacturing efficiencies lag behind those imposed in the EU. In short, producing any product in China is invariably a more energy-intensive undertaking, with coal and other non-renewable sources involved more readily in the mix, wrote the authors.

"It takes a lot of energy to extract and process solar-grade silicon, and in China that energy tends to come from dirtier and less efficient energy sources than it does in Europe," said co-author of the report and Argonne scientist, Seth Darling. "This gap will likely close over time as China strengthens environmental regulations".

Darling added that although this particularly study did not factor in transportation of the finished module, had it done so then the disparity between Chinese- and European-made would have (for a panel installed in Europe) been even greater, perhaps by as much as 60%.

Further research carried out by the team included an analysis of different types of silicon panels. The study found that monocrystalline solar panels delivered the best efficiencies in harvesting solar energy but, due to their energy-intensive manufacturing process, the 'pay back' on energy used overall was longer. Multicrystalline panel products were the second-best in terms of efficiency, followed by ribbon silicon panels, which, although the least efficient in harvesting energy, were also the least energy-intensive to make, meaning their 'energy pay back' period is the shortest.

The report's conclusion on making the production of solar panels more sustainable arrived at the proposed introduction of a break-even carbon tariff, calculated in the range of €105-€129 ($143-$176) per ton of carbon dioxide used.

"This tariff would be based on the carbon footprint and energy efficiency difference between manufacturing regions, and would be a better market- and science-based solution than a solar panel tariff," said the paper's lead author, Dajun Yue.

Read more: http://www.pv-magazine.com/news/details/beitrag/chinese-made-panels-have-twice-the-carbon-footprint-of-european-ones—study-finds_100015278/#ixzz38jUjT068

If the mind is intensely eager, everything can be accomplished—mountains can be crumbled into atoms. - SWAMI VIVEKANANDA

JAPAN FOCUSES ON ZERO-ENERGY BUILDINGS

In the wake of the Fukushima meltdowns, suspension of all nuclear plants (which once provided about 33% of the nation's electricity and were slated to generate half), and subsequent head-butt from expensive fossil fuel replacement, energy resource-poor Japan is aggressively pushing forward with renewable power options.

Formerly a prominent nuclear booster, Prime Minister Shinzo Abe—now apparently a convert to "all-of-the-above"—has picked up on an initiative declared during an earlier administration. In April, Abe reaffirmed the goal of making all new public buildings zero-energy by 2020, and private buildings by 2030. (For comparison: the European Union wants its buildings to be "nearly zero-energy" by 2020, and the US Department of Energy has a 2025 goal for cost-effective commercial sites.)

Taisei's zero-energy building in Yokohama (icef-forum.org)

Of course, these structures are not really zero-energy buildings. What they do is make up for all or nearly all their power consumption through conservation and by generating power from rooftop plus unconventional three-wall solar PV. Daytime excess goes into batteries to keep the lights on at night and on rainy days. Even the *Wall Street Journal* is perking up its ears at this news.

The rooftop power installation of the ZEB is nothing new. It's the sides. Their organic PV cells, currently less efficient and more expensive than rooftop panels, are light, thin, and bendable. They thus offer great opportunity in places where ordinary panels are hard to attach. Mitsubishi Chemical intends to mass-produce the slender side panels next year.

Taisei, one of the top Japanese construction firms, just completed a zero-energy building for offices south of Tokyo that's solar-paneled in this novel design. Opened in May as part of the Yokohama Smart City Project, the structure is on track to have net-zero energy use by the end of its first year of operation, if not sooner. The rooftop and government-supported all-wall solar panels generate all the power the zero-energy building needs. Although it's still grid-connected, it can send as well as draw power.

Conservation measures include not only motion sensors for lighting, but also wind direction sensors that signal workers when it makes sense to open a window. Air-conditioning comes through floor vents to each desk, so workers can fine-tune the amount of cool air and its direction.

That service is the noblest which is rendered for its own sake. - Gandhi

Taisei says its three-story Yokohama office structure cuts energy down to a quarter of that used by conventionally powered buildings of similar capacity. While in 2010 Europe and the US accounted for 70% of ZEB construction, Nomura Research Institute predicts that Asia will account for about half of the global market by 2030.

Japan's *Kajima* Corporation, a 170-year-old concern that built Japan's first nuclear reactor in 1957 and is also known for high-rise, tunnel, and bridge construction, says it wants to build a medium- or high-rise zero-energy building for offices by 2020, and *Obayashi* Corporation, like Taisei among the nation's top five construction companies, is considering a "life-cycle zero-energy building" that even pays off all the energy used in materials and construction.

Though the side-panel tech is still expensive and not yet on the market commercially, Taisei President Takashi Yamauchi compared the achievement to a concept car, capable through mass production of recouping the owners' investments within a feasible time frame. One way to lower costs would be to make the side panels more efficient. Investors hope today's 5% conversion rate will rise to about 20% by 2020.

The company foresees expanding the concept to Japan's crowded cities. The government agrees. Said Kimihiro Hashimoto, director-general of the Japan land ministry's housing bureau," Zero-energy buildings could be one of the key pillars for our growth strategy."

Courtesy: Clean Technica

PROTOTYPE LITHIUM ION BATTERIES BY FIRST QUARTER 2015

Malaysia will be producing its prototype lithium ion batteries for electric buses, cars and energy storage by the first quarter of next year.

The project, which is a collaboration between the Malaysia Automotive Institute (MAI), transport logistics firm ARCA Corp Sdn Bhd and Australia's AutoCRC Ltd and Swinburne University of Technology, is aimed at developing the most energy-dense battery for the market, says MAI chief executive officer Madani Sahari.

"There are only a handful of lithium ion battery manufacturers on a global level. We're currently conducting research on producing a prototype for the local market and possibly export.

"However, we want to focus on producing batteries with high energy density," he told *StarBiz*.

Madani said the prototype battery would first be used on an electric bus prototype that is being be developed by ARCA Corp.

"The bus is expected to start running in the second quarter of 2015".

According to reports, the buses will first begin operations in Putrajaya and Langkawi. ARCA's total investment is said to exceed RM200mil over a period of four years, part of which may be provided by the Government should the company qualify for financial assistance.

The next step, said Madani, was to "upscale" the production of the lithium ion batteries.

"Once we have successfully tested the prototype battery, we want to then produce them locally on a wider scale".

"This would be more cost-effective than having to source for them from other countries".

Madani also confirmed earlier reports that plans were in the pipeline to set up a plant to produce the lithium ion batteries.

"We have not finalised whether to set up a brand new plant or expand an existing plant," he said.

The plant is part of the National Automotive Policy (which was announced in January) to reduce vehicle prices by 2018 and help turn Malaysia into a regional energy-efficient vehicle hub. *Courtesy: ECO Business*

ADVANTAGES OF SOLAR ENERGY

Solar energy i.e. energy from the sun provide consistent and steady source of solar power throughout the year. As our natural resources set to decline in the years to come, its important for the whole world to move towards renewable sources. The main benefit of solar energy that it can be easily deployed by both home and business users as it does not require any huge set up like in case of wind and geothermal power stations. Solar energy not only benefits individual owners, but also benefit environment as well.

See more at: http://www.conserve-energy-future.com/Advantages_SolarEnergy.php#sthash.eK7ZwdEI.dpuf

GERMANY KEEN TO OFFER EXPERTISE FOR GANGA CLEAN-UP MISSION

Germany is keen to offer its expertise for the Ganga clean-up mission by bringing in the experience of cleaning Rhine river there.

"Rejuvenation and cleaning of the river Ganga is one of the top priorities of Indian government. We are now just in the phase where we are going to see how we are going to assist the Indian government in this important endeavour," Heiko Warnken, head of Economic Cooperation and Development, Germany, said on the sideline of a seminar.

"We will soon have a mission who will be coming to India with experts from Germany. We have also cleaned the river Rhine in Germany. We will see how we can assist in the Ganga mission," Warnken said.

According to a 2012 Central Pollution Control Board report, around Rs 20,000 crore has been spent by the government on various clean-up projects for the Ganga but with very little impact.

Warnken said they have been approached by Indian Water Resource Ministry for the Ganga cleaning.

Read more at: http://economictimes.indiatimes.com/articleshow/38978560.cms?utm source=contentofinterest&utm_medium=text&utm_campaign=cppst

WIND POWER WILL DELIVER MORE THAN 7 PERCENT OF THE WORLD'S ELECTRICITY BY 2018

Head**wind**s in several key markets, including the United States and Spain slowed growth in the global **wind** power market dramatically in 2013. Still, **wind** power now supplies nearly 3 percent of the world's electricity, and is expected to grow strongly over the next several years. Click to tweet: According to a recent report from Navigant Research, **wind** power will deliver 7.3 percent of the electricity consumed worldwide by 2018.

"Last year was the first in which the **wind** industry experienced negative growth since 2004, but there are signs that the 2013 slowdown will turn out to be an anomaly," says Feng Zhao, research director with Navigant Research. "As **wind** turbine vendors search for new opportunities in emerging markets, primarily in Latin **America** and **Africa**, and develop machines for maximum energy production in low **wind** speed areas, the industry is expected to add another 250 gigawatts of capacity through 2018".

Helping to drive that growth will be the offshore market, which saw 13 new projects installed in 2013, adding 1,720 megawatts—a 50 percent increase over 2012 . Nearly half of all new offshore capacity in 2013 was installed in the United Kingdom, according to the report, with all of that capacity supplied by Siemens, the world's largest supplier of offshore turbines.

Navigant Research's BTM Wind Report covers developments in the **wind** energy sector during 2013. This is the 19th edition of the annual World Market Update. As in previous editions, this report analyzes important changes over the last 3 years and provides a 5-year market forecast, as well as an assessment of likely market progress for the next 5 years. The special theme of this year's report is a review of the Global Onshore Wind Operations and Maintenance Market.

Courtesy: EQ Maglive

LIGHT INDIA 2014

Light India 2014 inaugurated by Honorable Union Minister of Power, Piyush Goyal on 17th Sep 2014 at Pragati Maidan. In his inaugural speech " with growing consumer standards, urbanization and government's aspiration to make lighting available for all, consumption of power for lightings should not go up from existing 19%. It is essential to educate the citizens and encourage adoption of sustainable lighting and I appreciate the role light India is playing in raising consciousness among people. Country is realizing the importance of this exposition and I can see a lot of brands have today. I would urge sector players to scale up their operations to make energy efficient lighting solutions viable and attractive to consumers". As an editor of our Association Newsletter, I had the privilege of attending this international event.

Regarding Messe Frankfurt, its one of the World's Leading Trade show organizers with around 543 million crores in sales. It has 2026 active employees Worldwide with a global network of 28 subsidiaries and 50 International Sales partners.

In 2013, Messe Frankfurt, organised 114 trade fairs, of which more than half took place outside Germany.

Elcoma co-partnered the event with Messe Frankfurt. Elcoma is Electric Lamp and component manufacturers Association of India established in 1970, to establish liaison with government bodies and to support each other in matters connected with lighting Industry.

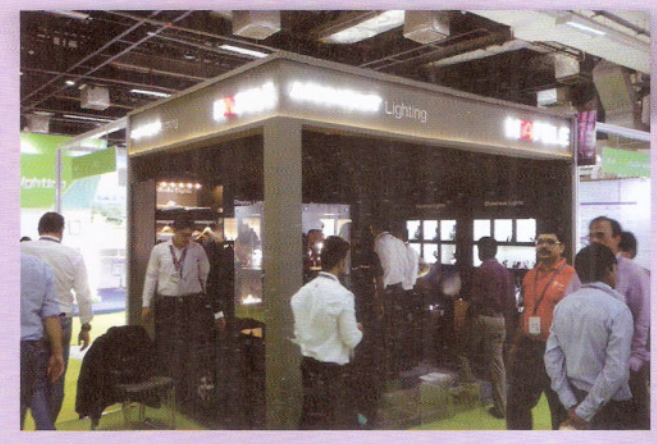
Coming back to the event, After Registration at hall no.7, started my visit to stalls in Hall-7. The stalls were mostly from China, mostly exhibiting routine LED fittings which are available in our local market.

Entering Hall 8, 9, 10 & 11 (combined hall) Philips, Panasonic, Trilux, B,A,G, Havells, Prolite..... Bigger players ruled the roost.

First Panasonic, after it acquired Anchor in India, Panasonic's new Avatar really makes it big among the Lighting Industry.

Bajaj Electricals has displayed best of its lighting range. Upgrade Galleria's theme made an impact among the visitors. Their massive stall layout was unique and crowd puller. Architectural lighting Display made them unique.

Haffle Lighting display was focussed towards commercial showrooms lighting their wardrobe lighting attracted visitors like honeybees towards honey.



DSE displayed some unique designed LED lights which attracted Architects & Interiors designers.

Sholite our Indian company, showcased their stunning range of stage lighting. Their stage LED Beamers & LED PAR Light are virtually show stoppers.

Havells displayed one of their finest LED Lighting range. Mostly their focus was in Architectural & Interiors designer's delight.

HPL had their own range of products. LED Panels, LED Streetlights & LED Retrofits formed most of their display.

Evertine

Seeing Full Field Speed Goniophotometer GOR 5000 & GO 2000 is indeed an unique experience. (Goniophoto meter is a photometer for measurement of the angular dependence of optical quantities. It is applicable to acquire the luminous intensity distribution, luminous flux, spatial color distribution and luminance distribution of lamps and luminaires.

GR-R5000 has received US patent rights and awarded "China Excellent Patent"

Our Chennai based Venture Lighting India Limited having its manufacturing facility in MEPZ, has showcased its products. Its White-Lux Plus, HPS replacement lamps drew attention of visitor, Mr. Laluchandran DGM-Mktg spoke to our Newsletter regarding their Uni-Form Natural white Series lamps which render 90+CRI.

Trilux, Opple and many more lighting companies participated and displayed their innovative products. Indeed it was interesting to see latest Lighting products by so many manufacturers in a single place.

We can be sure that Light Middle East event from 3-5th November 2014 at Dubai shall be even more interesting with more international players.

G. Venkatesh, Editor

THREE-PHASE UPS AND 3* SINGLE-PHASE RECTIFIER / SERVER LOADS - 2

Protection and operational reliability improvement using line / neutral inductances and neutral current compensator

3.0 Effect of Neutral Current Caused by Three Single-Phase Unbalanced Loads

3.1 Life of DC bus capacitors

Many times a three-phase UPS is used to supply power to three single-phase loads, with or without a transformer.

If there is no transformer used on output side of the UPS, the load neutral is usually connected to the star point of output filter capacitors, which is also connected to the midpoint of the DC bus capacitors. When the three single phase loads produce unbalanced currents, the effective / resultant load neutral current enters the star point of the output filter capacitors and hence, to the midpoint of the DC bus capacitors.

If there is a transformer used on output side of the UPS, it can then be Y/Y or D/Y connected. The neutral connection is tapped from star point of secondary side Y winding. When the three single phase loads produce unbalanced currents, the effective / resultant load neutral current enters the star point of the Y connected secondary.

Thus, whether the transformer is connected or not connected, the three-phase currents at the output of UPS remain unbalanced and produce unbalanced per phase VA / kVA.

A major component of the unbalanced neutral current is the 3rd harmonic produced by the rectifier loads. Gives a typical current waveform of a practically working server rectifier peaky load current delivered by a 10 kVA UPS, which has approximately 72% of 3rd harmonic presence. As will be seen later, this major harmonic can be almost reduced to zero value (when present as part of effective / resultant three single-phase rectifier loads supplied by a single three phase UPS).

This unbalanced VA / kVA produces second harmonic (proportional to the unbalanced loading) which has to be absorbed by the DC bus capacitors. The increased value of the unbalanced loading, thus, increase the second harmonic absorption by the DC bus capacitors and reduce / constrain the life of the DC bus capacitors.

Refer Fig. 3.2 which explains the above situations.

3.2 Unwanted tripping of MCCB

The three single-phase loads carry return current in neutral associated with each phase supplying power to the corresponding single-phase load. When the three neutrals get connected together to complete the “return path”, they add up to produce the net unbalanced current (effective / resultant neutral current) which is returned to the UPS directly or returned to the star point of Y secondary if there is an output side transformer for the UPS as discussed above.

If the return path conductor carries high unbalanced current, it will naturally get heated up. The return path also passes through the power distribution MCCB and the MCCB can trip on sensing higher unbalanced current. This results in non-availability of power at load end, even though UPS power is still available. This situation is unwanted / unwarranted.

Refer Fig. 3.2 where the above situation is properly shown.

3.3 Other effects

Refer Fig. 3.2. The return path current or the effective / Resultant neutral current produced by the three single-phase unbalanced loads flows into the UPS directly or returned to the star point of Y secondary if there is an output side transformer for the UPS as discussed above.

This gives rise to what is called as “neutral shifting”. This means the star point potential is no longer maintained close to or equal to zero potential with respect to earth. Thus, it further gives rise to changing or fluctuating phase to neutral voltages, which could affect the loads or even shut down certain loads as over / under voltages are sensed by the electronics associated with internal power supplies of the loads (as the loads are basically active or non-linear loads).

4.0 Overcoming the Effect of Neutral Current Caused by Three Single-Phase Unbalanced Loads

4.1 Solution with NCC

It is clear from the above details that the return path or the resultant neutral current cannot be avoided in case of three single-phase loads. However, it is also necessary to find a solution for avoiding tripping of MCCB caused by this current as well as avoiding this current entering the UPS.

The solution is based on use of "Neutral Current Compensator (NCC)," which needs to be connected at appropriate location.

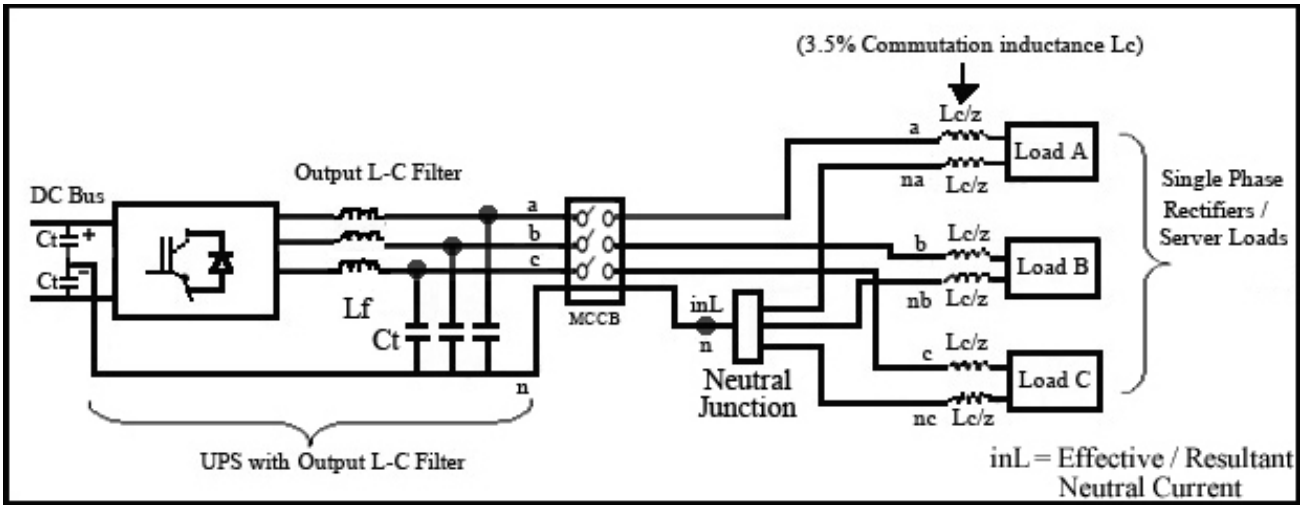


Fig. 3.2(a): Three-phase UPS supplying power to three single-phase rectifier loads (Without output transformer)

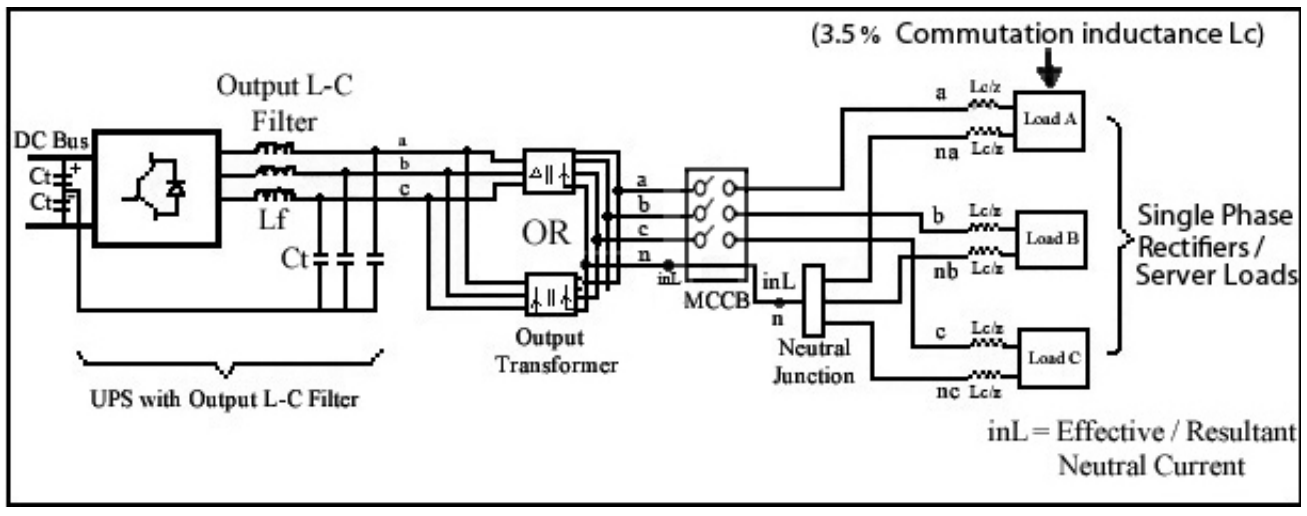


Fig. 3.2(b): Three-phase UPS supplying power to three single-phase rectifier loads (With output transformer)

The details of the NCC are given in Annexure-1.

The neutral current (i_{nNCC}) flowing out of the NCC is almost close to zero Amperes irrespective of whatever may be the return path or the effective / resultant neutral current (i_{nL}). Thus, the effective neutral current flowing through the MCCB as well as flowing into the UPS is maintained close to zero.

For the same data considered earlier, a Matlab / Simulink model is prepared as shown in Fig. 4.2. The model shows a 10 kVA UPS (with output LC filter) supplying power at 415V, 50 Hz, to three single phase rectifiers consuming approximately 3.5, 2.9 and 2.5 kW and uses NCC for making the effective / resultant unbalanced neutral current flowing through the MCCB into the UPS close to zero. The effective / resultant unbalanced neutral current caused by the loads is represented by "i_{nL}" and the neutral current (close to zero) flowing through the MCCB into the UPS is represented by "i_{nNCC}".

4.2 Simulation results

Fig. 4.3 gives the load voltages and currents for each of the rectifier and also the effective / resultant unbalanced current (i_{nL}) flowing into the NCC.

Fig. 4.4 gives the phase voltage and current distortion at the load. This is approximately 3.8% and 93.5% respectively.

Fig. 4.5 gives the UPS output voltage for phase "a", its current, voltage distortion, and the current distortion. The voltage distortion is 2.4% and the current distortion is 53%. These figures show considerable reduction in the

distortion as compared to the load voltage distortion and load current distortion. This is also visible from the current waveform in this figure as well from the Fig. 4.6. Fig. 4.6 also gives the output three-phase currents of the UPS, effective / resultant unbalanced current (i_{nL}) flowing into the NCC, and the neutral current (i_{nNCC}) flowing through the MCCB into the UPS. The current "i_{nNCC}" is close to zero.

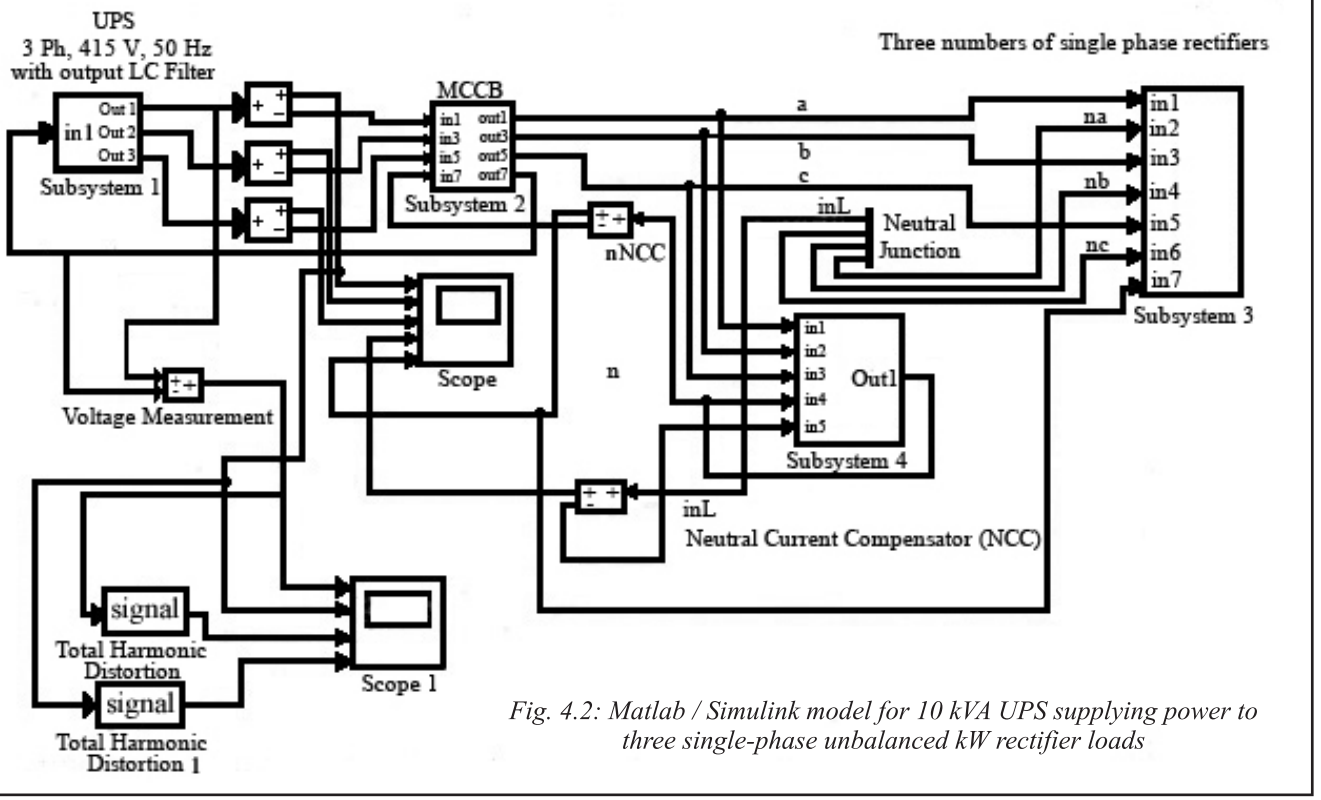


Fig. 4.2: Matlab / Simulink model for 10 kVA UPS supplying power to three single-phase unbalanced kW rectifier loads

The UPS output current waveforms show clearly the absence of the 3rd harmonic, which is the largest component of the effective / resultant unbalanced load current (i_{nL}), flowing into the NCC. The NCC also removes unbalance caused by harmonics, other than 3rd or triplens, present in the load currents. Thus, the ratings of harmonic filters, if required for the UPS, considerably reduce.

The NCC construction is based on use of transformers and it does not make use of any active devices such as Diode, Thyristor, and IGBT (Insulated Gate Bipolar Transistor). Thus, the NCC once connected is fit and forget kind of a solution. Other advantages of the NCC can be checked from the Annexure-1.

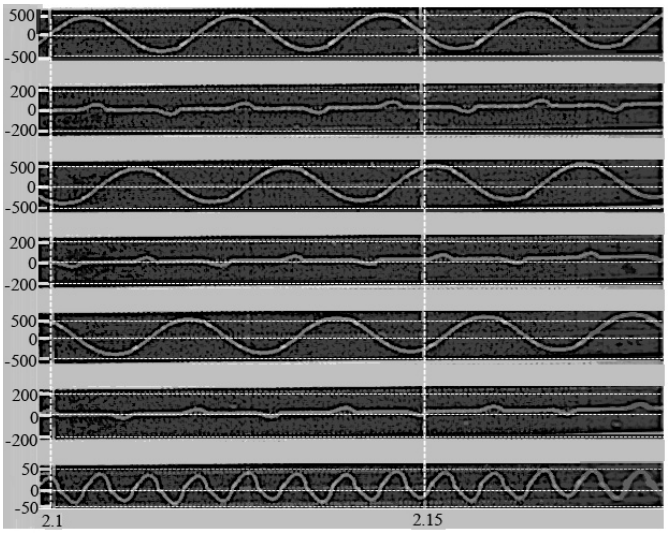


Fig. 4.3: Load voltages and currents for each of the rectifier and also the effective / resultant unbalanced current (i_{nL}) flowing into the NCC

Ch1: Phase "a" voltage (load), Ch2: Phase "a" current (load), Ch3: Phase "b" voltage (load), Ch4: Phase "b" current (load), Ch5: Phase "c" voltage (load), Ch6: Phase "c" current (load), Ch7: Effective / resultant unbalanced load neutral current (i_{nL}) entering the NCC

"Each one of us has to find his peace from within. And peace, to be real, must be unaffected by outside circumstances." – MAHATMA GANDHI JI

4.3 Rating of NCC

For determining the rating of the NCC, following parameters are needed.

- UPS output voltage and frequency and their expected (±) percentage variation
- UPS VA and VA of the three single-phase loads
- RMS value of effective / resultant neutral current i_{nL} (in Fig. 3.2)
- Typical waveform (for 3-8 cycles) of return path or resultant neutral current. This is preferred.
- List of presently faced problems or issues (as discussed here or other than those discussed here)

With the above details known, the NCC rating can be calculated. Usually, this rating will be 1/3 of the UPS VA (or summation of the VA rating of the three single-phase loads).

5.0 Conclusion

The article highlights, the use of proper line and neutral inductances for separately used three single-phase rectifier loads providing power to server and computer loads.

It also brings out the problems arising from unbalanced single phase loads / effective neutral current produced by the unbalanced loads; namely heating of the neutral section carrying the total unbalanced current, tripping of distribution MCCB, and increased second harmonic in UPS DC bus affecting life of DC bus capacitors and hence that of the UPS. To overcome these problems and enhance the overall operational reliability of the total system, a simple and cost effective solution is suggested based on use of NCC.

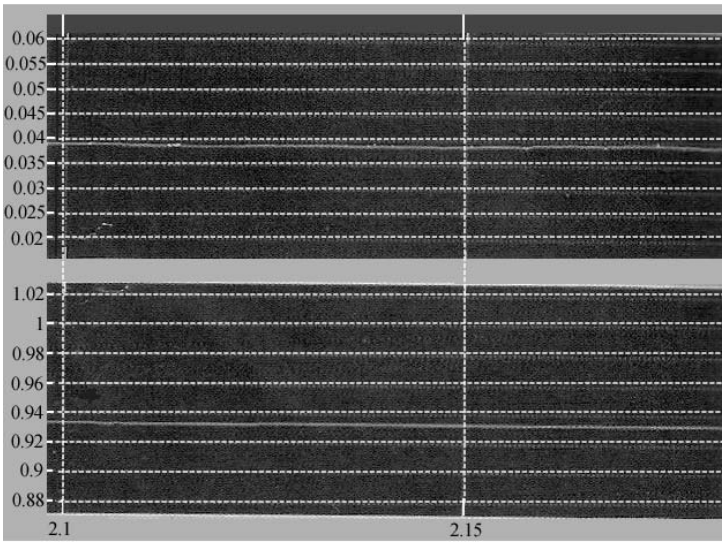


Fig. 4.4: Load voltage and current distortion

Ch1: Phase "a" voltage distortion at load,
Ch2: Phase "a" current distortion at load

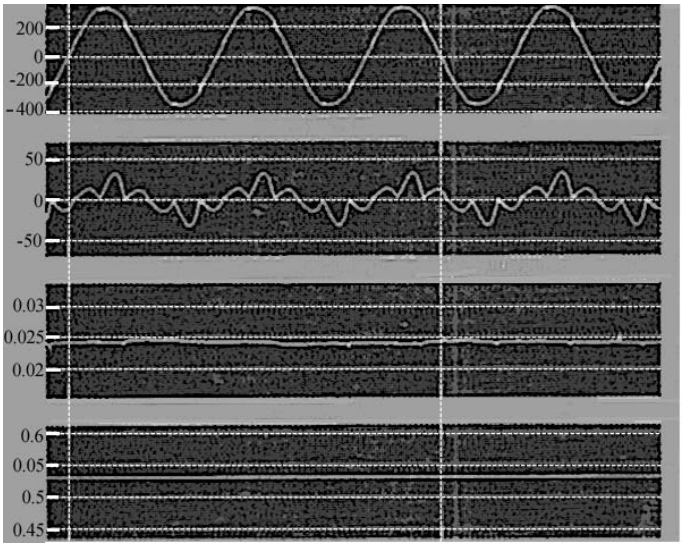


Fig. 4.5: UPS phase voltage, current and their distortions

Ch1: Phase "a" voltage at UPS, Ch2: Phase "a" current of UPS, Ch3: Phase "a" voltage distortion at UPS, Ch4: Phase "a" current distortion at UPS

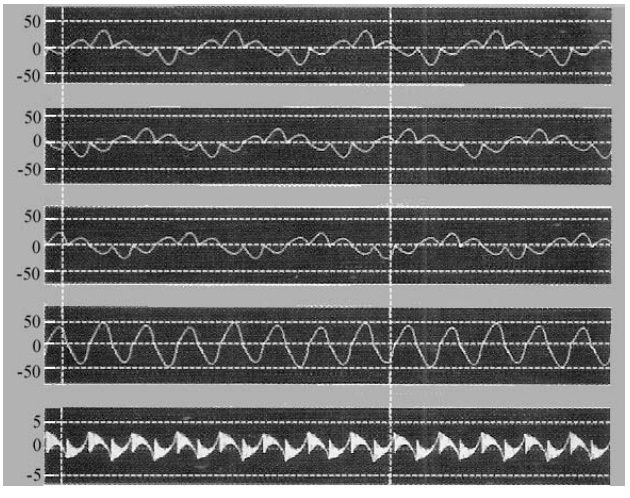


Fig. 4.6: UPS currents, effective load current and UPS neutral current

Ch1, Ch2, Ch3: Phase "a", "b", "c" currents at UPS, Ch4: Effective / resultant unbalanced load neutral current (i_{nL}) entering the NCC, Ch5: Almost zero (10-4) neutral current (i_{nNCC}) from NCC flowing through the MCCB into the UPS

Annexure-1

Neutral Current Compensator (NCC)

Simple and reliable solution eliminates neutral current problems in Iv to hv systems

1.0 Neutral current causes, effects and mitigation

1.1 Causes

- Unbalanced Fundamental active and or reactive currents
- Unbalanced current harmonics (drawn by non-linear loads in three-phase systems)

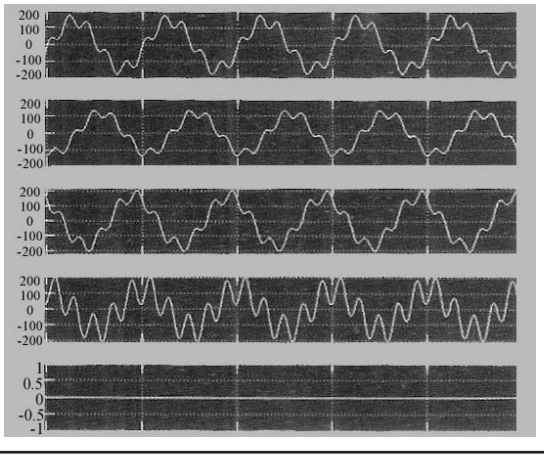
1.2 Effects

- Heating of neutral busbar or burning / insulation failure of neutral cables
- Shifting of supply neutral potential with respect to earth potential based on earth resistance and the neutral current
- Unacceptable unbalance or asymmetry in phase to neutral voltages damaging sensitive loads such as in medical applications
- Disconnection from supply neutral point or earth resulting in phase to phase voltages appearing across loads and subsequently causing damage to loads (example: Tube lights, bulbs, fans, TVs, refrigerators and other household appliances)
- Disturbances in synchronization voltages for connected active power converter
- Large unbalanced loads causing voltage disturbances to other loads connected on same bus, sometimes resulting in visible flicker
- Reduction in life of incoming supply transformer
- Associated monetary / financial loss due to non-availability of load

2.0 Salient Features / Advantages of the NCC

- Can be used for star as well as delta connected supply feeding power to star connected balanced / unbalanced and linear / non-linear load
- Reduces neutral current flowing in the supply (directly or through earth) to near zero value, irrespective of the type of non-linear load
- Helps in retaining supply neutral voltage (star point) close to earth or zero potential even when earth resistance is high (earth pit goes dry) or supply neutral point gets disconnected from earth or load neutral gets disconnected from supply neutral point or load neutral gets disconnected from earth
- Eliminates “performance” dependency of load neutral connection to supply neutral point or earth
- Reduces unbalance current caused by triplens as well as by other unbalance in other harmonics present in the load currents
- Reduces asymmetry in phase to neutral voltages (deviation from average value) by almost 50%, which further helps in reducing the unbalanced load neutral current.
- Uses only magnetic components offering high reliability
- Robust (fit and forget)
- Easy to manufacture, erect and commission
- Very economical

3.0 NCC Matlab Simulation Results



Ch1, Ch2, Ch3: Line currents i_a, i_b, i_c (100^+ to 200 A peak to peak), Ch4: Uncompensated Neutral Current i_{nL} (200 A peak to peak) of the load, Ch 5: Compensated Neutral Current i_{nNCC} (0 A) flowing out from the NCC

Fig. A3.1: Simulation results for unbalanced non-linear load

4.0 NCC Experimental Results for 30 kVA Unbalanced Load with NCC Installed at a Hospital in Sangli

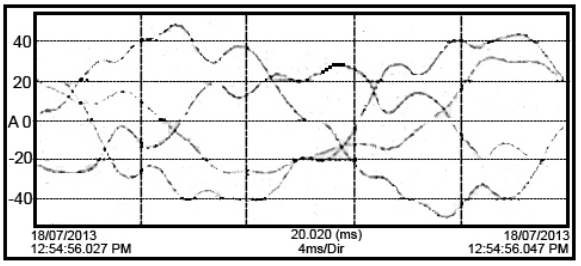


Fig. A4.1: The three load currents and neutral current shown by Green (with peak approaching 35 A without NCC installation) entering the supply neutral point

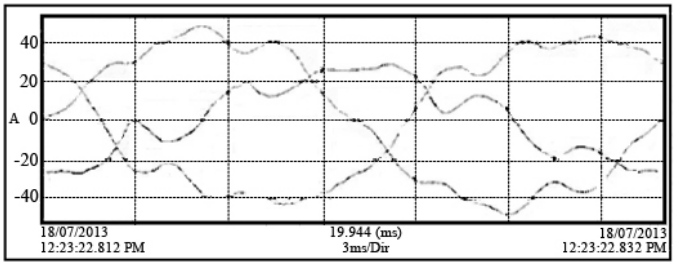


Fig. A4.2: The three load currents and neutral current shown by Green (almost close to zero with NCC installation) entering the supply neutral point

Comments by the Scrutineer

Only theoretical work is presented. It may be advisable that author shall include observed experimental results also. Further, author shall throw light on zero sequence components and its effect.

Author's Reply

The article's focus is retained on protection and reliability improvement of 3*single-phase loads supplied by three-phase UPS. Thus, requirement of commutation inductances is highlighted and effect is presented through simulation. The use of 1% inductance in neutral for 3*single-phase SMPS needs a separate understanding and hence is covered separately. Few sentences are added in sections 2.1 and 2.2 to make it complete.

For the NCC, the practical results are covered in Annexure-1, which suffice understanding of the NCC functionality. The sections seen together along with the Annexure-1 thus adequately cover theoretical aspects as well as necessary simulation and practical results. They should be, hence, able to meet the basic objective of improvement of protection and reliability of the entire system, which has a three phase UPS supplying power to 3*single-phase rectifier / server loads.

Zero sequence current is covered in section 1.0 and the effects are covered adequately in Annexure-1.

Dr V R Kanelkar,
Shreem Electric Limited,
Jaysingpur, Maharashtra

Courtesy
Ieema Journal, January 2014

DUBAI LAUNCHES MALL OF THE WORLD PLAN

Dubai is bundling a lot of "world firsts" for the Mall of the World development – its most ambitious project since the emirate's economic revival began in earnest since early 2012.

The project is to be the retail and hospitality showpiece development for the Expo 2020 in Dubai, alongside the planned mega convention centre and related infrastructure that will be rolling out of the design board shortly.

"Our ambitions are higher than having seasonal tourism. Tourism is key driver of our economy and we aim to make the UAE an attractive destination all year long. This is why we will start working on providing pleasant temperature-controlled environments during the summer months." Shaikh Mohammad

The Mall of the World is to be located along Shaikh Zayed Road. But in its conceptualization, the project – which will be managed by Dubai Holding - will be nothing less than a city-within-a-city and also include 100 hotels.

The development will be staggered along multiple phases. The cost of the build-up has not been revealed.

Apart from being the largest mall in the making by occupying 8 million square feet, it is being billed as the world's first "temperature-controlled (pedestrian) city" and with a 48 million square feet spread. This will be through a glass dome enclosure that will be open up during the winter months, a high season for the city's retail, leisure and hospitality sectors. On completion, it will be a year-round destination that is projected to pull in 180 million visitors annually.

NTPC LIMITED TO SET UP 4000 MW POWER GENERATION PLANT AT RAMAGUNDAM

NTPC Limited has agreed to set up 4000 MW Power Generation Plant at Ramagundam adjacent to their existing units as an expansion unit.

The Honourable Chief Minister assured the NTPC Chairman and Managing Director Dr. Arup Roy Choudhury, who called on him at Secretariat, Hyderabad that, the required coal linkage for NTPC plant will be taken up by the Telangana government with Government of **India**. He has agreed to provide the required land in Toto either from out of the available land or from acquiring from Singareni.

The Chief Minister also said that the government will undertake filling the mines with ash. The Chairman NTPC said that the work at the unit will commence immediately and first unit will be completed within 39 months. Necessary environmental clearances will be obtained by Telangana government for establishing the unit.

Along with Chairman & Managing Director NTPC, Sri. N.N. Misra, Director Operations, Sri. A.K. Jha, Director Technical, Sri. R.Venkateswaran, Regional Executive Director (South) have called on the Chief Minister.

Sri. Suresh Chanda, Prl. Secretary Energy & CMD Transco, Sri. D. Prabhakar Rao, CMD Genco and Sri. S.Narsing Rao Prl.Secy. to CM are present in the meeting.

GANDHIJI BELIEVED

For a bowl of water give a goodly meal:
For a kindly greeting bow thou down with zeal:
For a simple penny pay thou back with gold:
If thy life be rescued, life do not withhold.
Thus the words and actions of the wise regard;
Every little service tenfold they reward.
But the truly noble know all men as one, And return with gladness good for evil done.

The resemblance of this Gujarati poem to the chapters in Thirukkural on "***seinandriyaridal*** " (Gratitude) and ***"Inna Seyyamai"*** (refraining from harmful deeds) is striking.

Particularly these kurals :

The way to punish those who harmed us is to shame them by doing them good.

Those who know the true value of a favour, will see for the quantum of favour, a tree, where there was a grain.

No wonder, Gandhi later said : "I wanted to learn Tamil, only to enable me to study Valluvar's Thirukkural through his mother tongue itself…. It is a treasure of wisdom…"

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4	(1) Installation of Captive generator (2) Electricity H.V. & M.V. Installation Proposals (3) Precautionary Measures to be taken in Design & Installation of building services including Electrical Services (4) The Indian Standard Specification	110
5	Self Certification Procedure	70
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16	A Treatise on Power Quality with a Focus on Harmonics	300

OTHER PUBLICATIONS

1	National Electric Code 2011 (NEC 2011)	4,070
2	National Lighting Code 2010 (NLC 2010)	3,370

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VEERAN AZHAGU MUTHU KONE - 2

Second Capture of Tirunelveli, 1756

In early 1757, Thevar along with Mahfuz Khan and supported by many Polygars marched towards Tirunelveli for the third time at the head of an army of 10,000 men. They camped near Tirunelveli but did not attempt to capture the town. Thevar remembered well what would happen if a largely primitive force engaged with the well-equipped army which held Tirunelveli. Instead, in an effort to seize the country-side, Thevar sent messages to Mudalis, or tax collectors, that from now on he was in charge and that they must pay tax to him. Talks were opened with the Raja of Travancore to persuade him to support the confederacy in exchange for which Thevar promised him those territories on which Raja of Travancore coveted. Soon the troops that held Tirunelveli marched to Madura and Mahfuz Khan marched into the abandoned town. Mahfuz was so intoxicated by this success-in reality only luck-that he on his own, ordered his men to assault the nearby fort of Palamkotta; his men suffered staggering losses. The commandant of Palayamkotta enticed Kattabomman, the rank opportunist to support him in exchange for lucrative land grants. Kattabomman's troops routed Mahfuz's troops who camped some distance away from the fort. After this Kattabomman retreated but Yusuf Khan came to the scene. Mahfuz Khan fled the scene to Nelkettumseval to join Thevar, who had left much earlier as he understood that plans were not working as he had envisaged. Thevar aided Mahfuz Khan's repeated but failed to seize Palamkotta. Thevar's troops helped Mahfuz's men to capture Kalakadu fort and deeded it to Raja of Travancore in an attempt to win him into side of confederacy.

Yusuf Khan threw a spanner into the confederacy's plans; originally named Marudhanayagam Pillai, a Hindu Tamil of Vellala caste who converted to Islam, he was one of the most brilliant generals of 18th century, comparable to Baji Rao. Yusuf Khan was a ruthless opportunist who felt no loyalty to any one except himself. Yusuf Khan's troops marched towards rebel country in south-west Tamil Nadu. He seized Kalakadu and captured the forts of Papankulam, Alvarkurichi, Brahmadesam and Tarankurichi; the first three were held by Mahfuz and the last by Polygar of Wadagiri, ally of Puli Thevar and most powerful of Western Polygars. In the summer of 1758, Puli Thevar, for the fourth time, was ready to clash with the English and Nawab. Puli Thevar was supported by Polygars of Wadagiri, Kotaltava, Naduvakurichi and Sorandai. Ettaiyapuram Polygar also joined Thevar's enterprise and soon confederates persuaded the Polygar of Settur to join them.

Stand At Settur & Aftermath, 1759

Puli Thevar camped his troops inside the Settur fort, only 15 miles from Srivilliputtur and their joint force ravaged the enemy-held surrounding zone. Yusuf Khan besieged the Settur fort, whose Polygar lost nerve and expelled Thevar's troops, paid a fine and surrendered. Thevar's troops re-grouped and they seized all enemy outposts from Nelkettumseval to Tirunelveli and massacred the garrisons they overran. This great success elated Thevar and his confederates and they attacked and captured the Uttumalai fort held by a pro-English Polygar and prepared to capture Palamkotta and Tirunelveli. The arrival of Yusuf Khan's troops at Srivilliputtur checked their progress. Instead of an open fight, Thevar wisely chose to strengthen the chain of posts he had captured. He also sent troops to Nelkettumseval to prepare for defence and spread out his troops around Yusuf's army in order to harass Yusuf's troops.

Yusuf was far stronger and soon he recaptured all the outposts seized by Thevar and then he marched and destroyed much of Polygar country by fire and sword. But even so his attempt to reduce Polygars went only slowly as Polygars retreated into their strong impregnable forts. Soon Yusuf was forced to retreat because of orders from British authorities. In 1759, Thevar took revenge; he marched towards Palamkotta and the garrison troops came out and fought Thevar's men. Thevar devastated his enemy's force in open field,

but retired-as he knew that it would be nearly impossible to storm a well-defended fort. The incident was an embarrassment and shock to the English. Thevar's troops overran the countryside from Nattam to Travancore also. Enemy garrisons were safe only in their forts. They once more deputized Yusuf Khan to crush Puli Thevar. Thevar was worried that Mahfuz Khan might switch sides-he was a rank opportunist-and so kept him under close watch.

Second Struggle with Yusuf Khan

The pro-British Kattabomman died and the new Kattabomman loathed them. He, as the leader of Eastern Polygars, pledged support to Puli Thevar, the undisputed leader of Western Polygars. This union was aimed to meet the threat of Yusuf Khan. Yusuf Khan could have been driven back easily if he had to face so mighty a confederacy alone. Some Polygars were eager to collaborate with enemy. Yusuf came into Polygar country with only 1000 men but soon his army grew to 4000 with support from these renegades. Even so he was not ready. He waited for reinforcements to come. His strategy, till he received reinforcements, was to prevent the armies of Puli Thevar and Kattabomman from joining. He sent a heavily armed force into Ettaiyapuram with this task-they were to fight and block Eastern Polygars' troops so that he could deal with Puli Thevar and men separately. Once fully prepared, Yusuf Khan marched on. His force captured the strategic fort of Kollarpetti and reached Tirunelveli. Mahfuz Khan requested a pardon from Yusuf Khan and a jagir for himself if he left Thevar's camp. Yusuf Khan assured him that his demands would be met.

Puli Thevar surprised an enemy army at Sorandai and massacred and looted it. Yusuf immediately sent another force to retaliate, but Thevar had left by that time. Travancore troops began incursions into lands between Cape Comorin and Kalakadu. The Maravas of Puli Thevar and his allies ravaged all of Tamil country south of Tirunelveli and Yusuf who had to deal with three enemies, appeared in dire straits. An idiotic action by the Polygar of Wadagiri turned the tables. He had let his Maravas repeatedly plunder the territories of the Travancore Raja who was his neighbour too. The Raja of Travancore, angry at this policy, began to have second thoughts. Yusuf Khan exploited this by opening talks with the Raja of Travancore. This talk was to have fatal consequences. The Raja of Travancore agreed to side with Yusuf, if he left the Polygar confederacy. The Raja sent a large force of musketeers to join with Yusuf's troops-altogether 20,000 men marched towards the fort of Wadagiri, and Polygar had to escape as he could not withstand them for more than a day.

The Polygar of Wadagiri took refuge with Puli Thevar at Nelkattumseval. Puli Thevar himself was unnerved-the most powerful Western Polygar-Wadagiri Polygar-is finished. He learnt that the French had sent a letter to Mahfuz Khan which stated that soon the English would be finished and that Mahfuz would be crowned as Nawab after the present Nawab, an English puppet, was ousted. Thevar exploited this situation. He sent a message to Travancore Raja about this letter and argued that since the French will win in the end, what would Travancore gain if they allied with the English, whose man was Yusuf? Thevar offered that if Travancore Raja side with them, he would let Raja have those parts of Tirunelveil of his own choice.

The Travancore Raja told Yusuf Khan of this communication of Puli Thevar. The Raja of Travancore argued that since Thevar had offered him so much, he will side with Yusuf only if Yusuf ceded the land between Cape Comorin and Kalakadu that Nawab had denied to Travancore. He also threatened Yusuf that if he supported Thevar that would mean the end of Nawab's ambitions in country south of Tirunelveli-which indeed was a real threat.

The Dutch seizure of artillery sent by English meant for Yusuf Khan, opened the prospect of war with Dutch in Tuticorin [Toothukudi]. Yusuf relented and ceded the territories demanded by the Raja and so Puli Thevar's attempt to win this Raja ended in failure. If the Raja had allied with Thevar, the British conquest of South India might have been delayed by years and even decades.

Thus Yusuf Khan was saved because by that time, Maravas across southern Tamil Nadu had flocked to Thevar's fort to fight for their hero. It was beyond the capacity of Yusuf Khan to overpower so great a host alone, but with help from Travancore assured, he was confident. Soon, Travancore troops and Yusuf Khan's units jointly captured the fort of Isvara Thevar, a vassal of Puli Thevar. Isvara Thevar and his men retreated to Nelkettumseval, but this victory had exhausted his ammunition and he was delayed in his next move. As they waited, a force of 6000 Maravas launched a surprise raid on the Travancore camp and killed several troops. But by time Yusuf Khan marched with his men, Marava force had retreated.

Siege of Vasudevanellur, 1759–1760

In December, 1759, Yusuf besieged fort of Vasudevanellur with his allied troops after he received a large stock of ammunition. This fort belonged to Puli Thevar and was his second strongest fort, located on top of a mountain range and was covered by a vast forest on all sides. Puli Thevar kept 1000 men in the fort and spread out the rest of his force in the forest that surrounded the fort. These troops raided enemy camps, sniped and ambushed scattered units of Yusuf's armies and they also disrupted his effort to build a massive construction for artillery batteries-it took three weeks for Yusuf to complete the construction; relentless bombardment caused Yusuf to lose some of his heavy artillery and most of his ammunition. He had breached

the wall of this mighty fort and he unwisely decided to engage his troops in a hand to hand combat with Thevar's soldiers. Puli Thevar was at this time not at Vasudevanellur-he was at his headquarters of Nelkattumseval. As both sides prepared for the final struggle for Vasudevanellur, Thevar collected 3000 of his ablest Maravas and led them in a night march from Nelkattumseval to Vasudevanellur. Once he approached Vasudevanellur's neighbourhood, Thevar led his troops through the forest below the fort to avoid detection by enemy and sprang into a surprise attack on Yusuf Khan's camp.

Thevar's troops devastated the enemy camp and Yusuf Khan threw a large force into the fray to tilt the balance. The Maravas, intoxicated by their success, fought with great ardour. In the meantime, those Maravas who had concealed themselves in forests and ambushed Yusuf Khan's troops for the last 3–4 weeks came out of the woods and began to attack Yusuf Khan's battery positions and the enemy infantry that was trying to move into the fort through the breach.

The Maravas were repeatedly beaten back by Yusuf's men, but each time they returned to the attacks. These Maravas worked together with the garrison to check the enemy advance into the fort and they were successful. The Maravas then returned to the woods below the fort and lay in wait for a renewed enemy attack in night. But Yusuf Khan was nearly exhausted of his ammunition and he foresaw the catastrophe if he stood before the fort without ammunition. The following day, Yusuf Khan and Travancore troops retreated and they split into two-Travancore troops went home while Yusuf and his men went to Tirunelveli. Yusuf Khan no longer had the ability to launch an offensive into Puli Thevar's country so he stayed at Tirunelveli and posted his men at key points to limit Puli Thevar's raids. For the time being his grand plan to crush this turbulent Polygar was shelved. Puli Thevar was in a dilemma as to what to do next because Mahfuz Khan had left him for his brother Nawab of Arcot, Muhammad Ali. Thevar hoped that Mahfuz will return to him if Nawab rejected his terms. There were also thoughts about a peace agreement with Yusuf Khan.

Thevar did not leave Yusuf Khan in peace. His Maravas ravaged Tirunelveli country so much that Yusuf Khan himself realised that he could not crush them by force so he bribed many of them to join his side. Yusuf soon found himself at war with Mysore and Dutch, which bought Thevar time. Yusuf Khan crushed a force of 3000 men sent by Kattabomman.

Thevar was in a depressed mood. He learnt that the French were besieged in Pondicherry by the English and that Mahfuz Khan had gone over to Nawab, but his Maravas ravaged lands held by Yusuf Khan so much that he soon deployed the bulk of his force in front of Nelkettumseval in order to force the Maravas to abandon his lands. He bought several pieces of heavy artillery but had no ammunition and sent a message to the British camp in Trichinopoly to sent him ammunition. As he awaited, Puli Thevar launched a lightning raid on Yusuf's camp and after killing and wounding several of Yusuf's men retreated.

The End

Soon Yusuf Khan received huge reinforcements and massive quantities of ammunition. He decided to conquer Thevar's country inch by inch. Thevar and his men put up most valiant resistance but their strongholds fell one by one and finally Nelkettumseval also fell. Thevar and men retreated from fort to fort and once they lost forts they fled in jungle where they continued fight until 1761.

What happened after this point of time is not clear - There are multiple versions of what followed. One version is that he was forced to go into exile in Ramanad where he died.

Another version is that Thevar soon was caught by a party of Yusuf Khan's troops and he was sentenced to death. He was made to march to a hill named Kalugamala [Vulture's Mountain] to be hanged. It is reported that he escaped on route. But it is also said that he requested his captors to pray in a Parvati shrine before his execution and he sang praises in the sanctum sanctorum of the temple and suddenly on sound of chains fall, guards rushed into the sanctum sanctorum only to find his chains - He had vanished.

இயற்கை மருத்துவம்

ரத்த வாந்திக்கான மருத்துவம்

வில்வ இலை, நொச்சி இலை, அருகம்புல் ஆகியவற்றின் சாறு 2 ஸ்பூன் எடுத்து பாதி மாதுளம் பழம் சேர்த்து ஜுசாக்கி 2 வேளை குடித்தால் ரத்த வாந்தி நிற்கும்.

இடுப்பு வலிக்கான மருத்துவம்

திராட்சைச் சாறு, மிளகு பொடி 1 ஸ்பூன், வில்வ இலை, உதிரக்காந்தல் இலை சேர்த்து ஜுஸ் செய்து குடித்து வர இடுப்பு வலி குணமாகும்.

அருகம்புல் சாறு 3 ஸ்பூன், மாதுளம்பழம் 3 பழத்தின் சாறு, மிளகு, காப்பு சேர்த்து குடித்து வர இடுப்பு வலி குணமாகும்.

கர்ப்பப்பை நீர்கட்டிகள் நீங்க மருத்துவம்

கழற்சிக்காய் 3 பருப்பு, துளசி, நாட்டுக்கோழி முட்டையின் வெள்ளைக்கரு நல்லெண்ணையில் வறுத்து பொடிமாஸ் செய்து சாப்பிட வேண்டும். 7 நாட்களுக்கு மேல் சாப்பிடக்கூடாது.

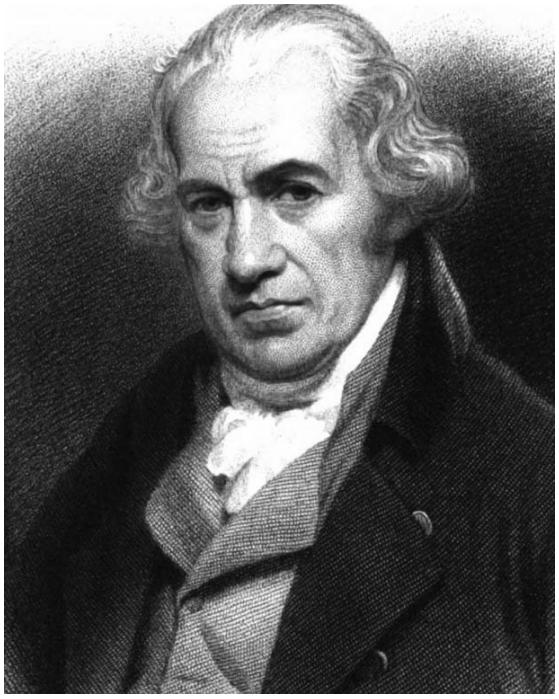
கருப்பை முட்டையை பாதுகாக்க

இலந்தை இலை 10. அம்மான்பச்சரிசி நெல்லிக்காய் அளவு, சின்ன வெங்காயம் 3 சேர்த்து அப்படியே மென்று சாப்பிடவேண்டும். கருப்பை முட்டை பலப்படும். அபார்ஷன் தடுக்கப்படும்.

Courtesy: Zee Tamil Natural Medicines

JAMES WATT (1736 - 1819) - 2

Chemical experiments



From an early age Watt was very interested in chemistry. In late 1786, while in Paris, he witnessed an experiment by Berthollet in which he reacted hydrochloric acid with manganese dioxide to produce chlorine. He had already found that an aqueous solution of chlorine could bleach textiles, and had published his findings, which aroused great interest among many potential rivals. When Watt returned to Britain, he began experiments along these lines with hopes of finding a commercially viable process. He discovered that a mixture of salt, manganese dioxide and sulfuric acid could produce chlorine, which Watt believed might be a cheaper method. He passed the chlorine into a weak solution of alkali, and obtained a turbid solution that appeared to have good bleaching properties. By 1794 Watt had been chosen by Thomas Beddoes to manufacture apparatus to produce, clean and store gases for use in the new Pneumatic Institution at Hotwells in Bristol. Watt continued to experiment with various gases for several years, but by 1797 the medical uses for the "factitious airs" had come to a dead end.

Personality

Watt combined theoretical knowledge of science with the ability to apply it practically. Humphry Davy said of him "Those who consider James Watt only as a great practical mechanic form a very erroneous idea of his character; he was equally distinguished as a natural philosopher and a chemist, and his inventions demonstrate his profound knowledge of those sciences, and that peculiar characteristic of genius, the union of them for practical application". He was greatly respected by other prominent men of the Industrial Revolution. He was an important member of the Lunar Society, and was a much sought-after conversationalist and companion, always interested in expanding his horizons. His personal relationships with his friends and partners were always congenial and long-lasting. He was a rather poor businessman, and especially hated bargaining and negotiating terms with those who sought to utilize the steam engine. In a letter to William Small in 1772, Watt confessed that "he would rather face a loaded cannon than settle an account or make a bargain." Until he retired, he was always much concerned about his financial affairs, and was something of a worrier. His health was often poor. He was subject to frequent nervous headaches and depression.

The Soho Foundry

At first the partnership made the drawing and specifications for the engines, and supervised the work to erect it on the customers property. They produced almost none of the parts themselves. Watt did most of his work at his home in Harper's Hill in Birmingham, while Boulton worked at the Soho Manufactory. Gradually the partners began to actually manufacture more and more of the parts, and by 1795 they purchased a property about a mile away from the Soho manufactory, on the banks of the Birmingham Canal, to establish a new foundry for the manufacture of the engines. The Soho Foundry formally opened in 1796 at a time when Watt's sons, Gregory and James Jr. were heavily involved in the management of the enterprise. In 1800, the year of Watt's retirement, the firm made a total of forty-one engines.

Later years

Watt retired in 1800, the same year that his fundamental patent and partnership with Boulton expired. Watt continued to invent other things before and during his semi-retirement. Within his home in Handsworth Heath, Staffordshire, Watt made use of a garret room as a workshop, and it was here that he worked on many of his inventions. Among other things, he invented and constructed several machines for copying sculptures and medallions which worked very well, but which he never patented. One of the first sculptures he produced with the machine was a small head of his old professor friend Adam Smith. He maintained his interest in civil engineering and was a consultant on several significant projects. He proposed, for example, a method for constructing a flexible pipe to be used for passing water under the Clyde at Glasgow.

He died on 25 August 1819 at his home "Heathfield" in Handsworth, Birmingham, England at the age of 83. He was buried on 2 September.

Industrial revolution

James Watt's improvements to the steam engine "converted it from a prime mover of marginal efficiency into the mechanical workhorse of the Industrial Revolution". The availability of efficient, reliable motive power made whole new classes of industry economically viable, and altered the economies of continents. In doing so it brought about immense social change, attracting millions of rural families to the towns and cities.

Of Watt, the English novelist Aldous Huxley (1894–1963) wrote; "To us, the moment 8:17 A.M. means something – something very important, if it happens to be the starting time of our daily train. To our ancestors, such an odd eccentric instant was without significance – did not even exist. In inventing the locomotive, Watt and Stephenson were part inventors of time."

Honours

Watt was much honoured in his own time. In 1784 he was made a fellow of the Royal Society of Edinburgh, and was elected as a member of the Batavian Society for Experimental Philosophy, of Rotterdam in 1787. In 1789 he was elected to the elite group, the Smeatonian Society of Civil Engineers. In 1806 he was conferred the honorary Doctor of Laws by the University of Glasgow. The French Academy elected him a Corresponding Member and he was made a Foreign Associate in 1814. The watt is named after James Watt for his contributions to the development of the steam engine, and was adopted by the Second Congress of the British Association for the Advancement of Science in 1889 and by the 11th General Conference on Weights and Measures in 1960 as the unit of power incorporated in the International System of Units (or "SI").

On 29 May 2009 the Bank of England announced that Boulton and Watt would appear on a new £50 note. The design is the first to feature a dual portrait on a Bank of England note, and presents the two industrialists side by side with images of Watt's steam engine and Boulton's Soho Manufactory. Quotes attributed to each of the men are inscribed on the note: "I sell here, sir, what all the world desires to have—POWER" (Boulton) and "I can think of nothing else but this machine" (Watt). The inclusion of Watt is the second time that a Scot has featured on a Bank of England note (the first was Adam Smith on the 2007 issue £20 note). In September 2011 it was announced that the notes would enter circulation on 2 November.

In 2011 he was one of seven inaugural inductees to the Scottish Engineering Hall of Fame.

March 2011 was put on public display as part of a new permanent Science Museum exhibition, "James Watt and our world".

The approximate location of James Watt's birth in Greenock is commemorated by a statue. Several locations and street names in Greenock recall him, most notably the Watt Memorial Library, which was begun in 1816 with Watt's donation of scientific books, and developed as part of the Watt Institution by his son (which ultimately became the James Watt College). Taken over by the local authority in 1974, the library now also houses the local history collection and archives of Inverclyde, and is dominated by a large seated statue in the vestibule. Watt is additionally commemorated by statuary in George Square, Glasgow and Princes Street, Edinburgh, as well as several others in Birmingham, where he is also remembered by the Moonstones and a school is named in his honour. The University of Glasgow's Faculty of Engineering has its headquarters in the James Watt Building, which also houses the department of Mechanical Engineering and the department of Aerospace Engineering. The huge painting *James Watt contemplating the steam engine* by James Eckford Lauder is now owned by the National Gallery of Scotland.

There is a statue of James Watt in Piccadilly Gardens, Manchester and City Square, Leeds.

A colossal statue of Watt by Chantrey was placed in Westminster Abbey, and later was moved to St. Paul's Cathedral. On the cenotaph the inscription reads, in part, "JAMES WATT ... ENLARGED THE RESOURCES OF HIS COUNTRY, INCREASED THE POWER OF MAN, AND ROSE TO AN EMINENT PLACE AMONG THE MOST ILLUSTRIOUS FOLLOWERS OF SCIENCE AND THE REAL BENEFACTORS OF THE WORLD."

Patents

Watt was the sole inventor listed on his six patents:

- Patent 913 A method of lessening the consumption of steam in steam engines-the separate condenser. The specification was accepted on 5 January 1769; enrolled on 29 April 1769, and extended to June 1800 by an act of Parliament in 1775.
- Patent 1,244 A new method of copying letters; The specification was accepted on 14 February 1780 and enrolled on 31 May 1780.
- Patent 1,306 New methods to produce a continued rotation motion – sun and planet. The specification was accepted on 25 October 1781 and enrolled on 23 February 1782.
- Patent 1,321 New improvements upon steam engines – expansive and double acting. The specification was accepted on 14 March 1782 and enrolled on 4 July 1782.
- Patent 1,432 New improvements upon steam engines – three bar motion and steam carriage. The specification was accepted on 28 April 1782 and enrolled on 25 August 1782.
- Patent 1,485 Newly improved methods of constructing furnaces. The specification was accepted on 14 June 1785 and enrolled on 9 July 1785.

Courtesy: http://en.wikipedia.org/wiki/James_Watt

SANSKRIT

In US, Bhagwad githa is taught in some Schools of Management. Vedas are recited at the beginning of the US Congress session and some State Legislature sessions. In Canada, one university has started a Department of Hinduism. In Croatia, a group chants the Vedas with the same enthusiasm and sincerity like pandits in India. Sanskrit is taught in many countries. New Zealand has a formal program.

A new discipline, called neuro linguistics, has been started in some UK and US Universities, which studies the chemical impact on the human brain on reciting Sanskrit mantras. US Defense department spent a few million dollars to design a language suitable for highly scientific communication in space. To their surprise, they found that Sanskrit was quite adequate as the most scientifically structured language. It is well known that Sanskrit is the mother of all major European languages. Sanskrit is the mother of all Indian languages, except perhaps Tamil. All languages contain 70 to 90 percent Sanskrit words. This shows the alienation of our leaders from India's heritage.

Courtesy: Heritage-Cartman, Feb 2012

NEW ZEALAND SCHOOL TEACHES SANSKRIT AND CLAIMS IT HELPS CHILDREN UNDERSTAND ENGLISH

Nevada (US), Jan 25 (ANI): A school in New Zealand has a 'Sanskrit Language Studies' program and claims that learning Sanskrit accelerates a child's reading ability.

Ficino School in Mt Eden area of Auckland (New Zealand), calls itself a 'values-based academic institution' and offers education for girls and boys from year one to eight. It says about Sanskrit: "It has a wonderful system of sound and grammar, which gives the child an excellent base for the study of any language. Children love its order and beauty".

Distinguished Hindu statesman Rajan Zed has applauded Ficino School for fostering universal virtues and encouraging Sanskrit studies and adds that Sanskrit has a close relationship with other classical languages like Latin, Greek, French, German, etc.

According to Peter Crompton, principal of this school founded in 1997, where curriculum includes "food for the mind, food for the spirit, food for the body", "Sanskrit with its almost perfect grammatical system...provides children with a roadmap for understanding English". Sanskrit not only gives young learners a clear understanding of the structure of language, it also heightens their awareness of the process of speech, creating a greater understanding of and ability to, enunciate words clearly, Crompton adds.

Rajan Zed He asked India Government to do much more for the development, propagation, encouragement and promotion of Sanskrit in India and the world, which was essential for the development of India and preservation of its cultural heritage. Sanskrit also provided the theoretical foundation of ancient sciences.

Besides Hindu scriptures, a vast amount of Buddhist and Jain scriptures were also written in Sanskrit, which is known as "the language of the gods". According to tradition, self-born God created Sanskrit, which is everlasting and divine. The oldest scripture of mankind still in common use, Rig-Veda, was written in Sanskrit, Zed added.

Mahatma Gandhi said, "Without the study of Sanskrit, one cannot become a true learned man". German philologist Max Muller added, "Sanskrit is the greatest language of the world". (ANI)

Courtesy: Heritage-Cartman, Feb 2012

POWER YOUR MIND

VIVEKANANDA-AN IDEAL

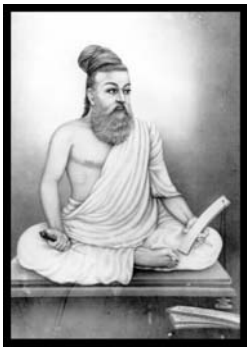
Vivekananda is an ideal for heroes
Who are awake
Who want to change
Who are sincere
And not for cowards
Nor for hypocrites who are selfish
And who want to cheat others by
Using his name only to serve
Their personal interest.

Courtesy: Swami Srikantananda

Men, men, these are wanted:
Everything else will be ready,
But strong, vigorous, believing
Young men, sincere to the
backbone, are wanted.
A hundred such and the world
Becomes revolutionized.

-Swami Vivekananda

TIRUKKURAL AND MANAGEMENT IN A 'NUTSHELL' - 18



In the present times of competitive Business Environment, Marketing and Business Management is, in fact, like a 'Warfare' with the importance of Strategy and Tactics etc. There are Business Management literature drawing lessons from the wars that were fought and won. The first and foremost requirement for the Business Management today are 'Team' and 'Leadership'. In order to build sustainable Business and Image or Brand Equity, the Quality and composition of the Team, adherence to basic Principles and Values, Quality of Equipments and the Process of Work as well as the Leadership become important. Apt lessons can be drawn from some of the Kurals of Tiruvalluvar in these regards as illustrated from the following examples.

The importance of the Team as well as its composition with both the young and the experienced, dealing with different functions are brought out in the following two Kurals.

Uruppuamainthu ooruancha Velpadai Vendan
Verukkaiyul Ellam Thalai Kural 761

உறுப்புஅமைந்து ஊறுஅஞ்சா வெல்படை வேந்தன்
வெறுக்கையுள் எல்லாம் தலை. குறள் 761

"A well organized (all functions) and puissant army (Team) that feareth not danger (competition) is the First among the possession for the Leader"

Nilaimakkal Sala Udaithuyeninum Thanai
Thalaimakkal Ilvazhi Il Kural 770

நிலைமக்கள் சால உடைத்துஎனினும் தானை
தலைமக்கள் இல்வழி இல் குறள் 770

"Even if there is no lack of troops (Field force) of the line, there is no army (Effective Team) when there are no chiefs to lead"

The importance of the presence of the experienced veterans in the team is stressed in the following Kural.

"Ulaivuidaththu Ooruancha Vankan
Thalaivuidaththuth
Tholpadaikku Allal Arithu Kural 762

உலைவுஇடத்து ஊறுஅஞ்சா வன்கண்
தாலைவுஇடத்துத்
தொல்படைக்கு அல்லால் அரிது. குறள் 762

"it is only the veterans that can hold out in desperate situations with grim determination, regardless of decimating attacks".

HOME FESTIVALS

Karttikai (November/December)

Krittika Dipa (right) is a joyous one day festival held on the Kritttika nakshatra (when the moon is in Pleiades constellation). Also called Sivalaya Dipa, it is celebrated most famously at Tiruvannamalai (upper left in the painting),on top of Arunachala Hill, home of saint Ramana Maharishi. A bonfire is lit on top that can be seen for miles around. Karthigai Purnima, the full-moon day, honours Lord Murugan. In one traditional story, six sparks from Siva's third eye became six babies (lower left), later gathered into one six-headed Arumugam (center) by Parvati. Celebrations include lighting hundreds of oil lamps especially the standing lamp (right) of the home. On this day in Orissa, devotees make banana leaf boats and float them in the river with oil lamps, (lower left).

(To be continued)

Those who are influential can use their influence to better the condition of the lowly. That way we can keep alive in our hearts a sense of social service. - H.H. Shri Paramacharya

AL-MASJID AL-NABAWI

Al-Masjid al-Nabawî often called the **Prophet's Mosque**, is a mosque built by the Islamic prophet Muhammad situated in the city of Medina. It is the second holiest site in Islam (the first being the Masjid al-Haram in Mecca). It was the second mosque built in history and is now one of the largest mosques in the world. After an expansion during the reign of al-Walid I, it also now incorporates the site of the final resting place of Muhammad and early Muslim leaders Abu Bakr and Umar.

The mosque also served as a community center, a court, and a religious school. There was a raised platform for the people who taught the Quran. Subsequent Islamic rulers greatly expanded and decorated it. In 1909, it became the first place in the Arabian Peninsula to be provided with electrical lights. The mosque is under the control of the Custodian of the Two Holy Mosques.

The mosque has a flat paved roof topped with 27 sliding domes on square bases. Holes pierced into the base of each dome illuminate the interior. The roof is also used for prayer during peak times, when the domes slide out on metal tracks to shade areas of the roof, creating light wells for the prayer hall. At these times, the courtyard of the Ottoman mosque is also shaded with umbrellas affixed to freestanding columns. The roof is accessed by stairs and escalators. The paved area around the mosque is also used for prayer, equipped with umbrella tents. Sliding Domes and retractable umbrella-like canopies are designed by the German architect Mahmoud Bodo Rasch and his firm SL Rasch GmbH and Buro Happold.

There are six peripheral minarets attached to the new extension, and four others frame the Ottoman structure. The mosque is lavishly decorated with polychrome marble and stones. The columns are of white marble with brass capitals supporting slightly pointed arches, built of black and white stones. The column pedestals have ventilation grills that regulate the temperature inside the prayer hall.

AL-MASJID AL-NABAWI

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