ELECTRICAL INSTALLATION ENGINEER

NEWS LETTER

TAMILNADU ELECTRICAL INSTALLATION ENGINEERS' ASSOCIATION 'A' GRADE (Regn. No. 211/1992)
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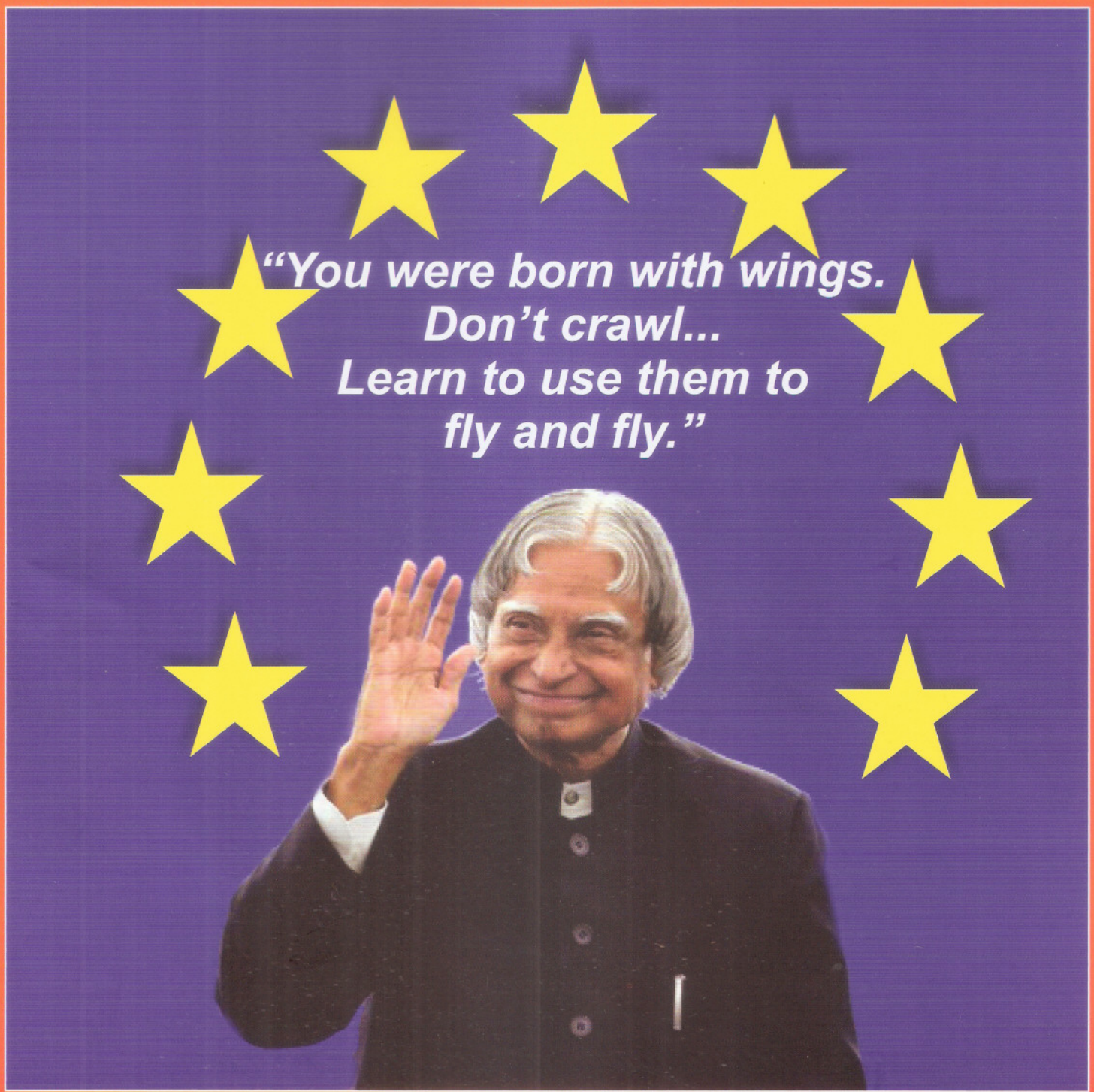
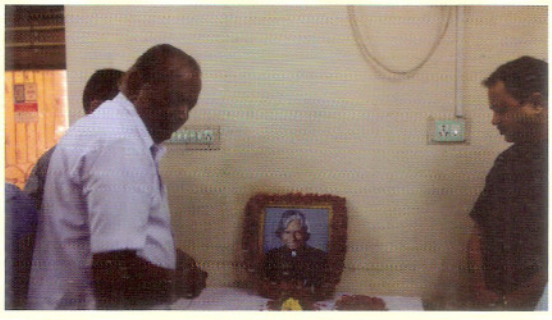
ISSUE NO. 114	VOL : No. 10/2015	MONTHLY ISSUE NO. 8	PRIVATE CIRCULATION ONLY	AUGUST 2015

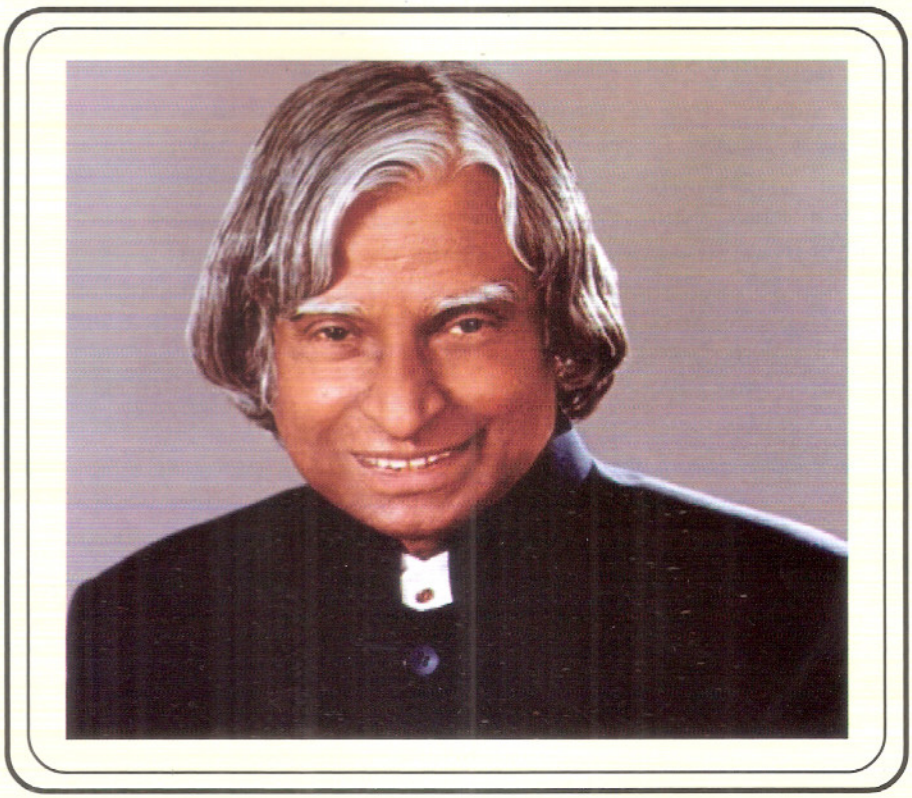




Homage to Dr. A.P.J. ABDUL KALAM by TNEIEA Members

11th President of India	
In office 25 July 2002 – 25 July 2007	
Prime Minister	Atal Bihari Vajpayee Manmohan Singh
Vice President	Krishan Kant Bhairon Singh Shekhawat
Preceded by	K. R. Narayanan
Succeeded by	Pratibha Patil
Personal details	
Born	Avul Pakir Jainulabdeen Abdul Kalam 15 October 1931 Rameswaram, Ramnad District, Madras Presidency, British India (now in Ramanathapuram District, Tamil Nadu, India)
Died	27 July 2015 (aged 83) Shillong, Meghalaya, India
Nationality	Indian
Alma mater	St. Joseph's College, Tiruchirappalli Madras Institute of Technology
Profession	Professor Author Aerospace scientist
Religion	Islam
Signature	
Website	abdulkalam.com

BHARAT RATNA
Dr. A.P.J. ABDUL KALAM



15-10-1931 27-07-2015

BHARAT has lost a Ratna, but the light from this jewel will guide us towards APJ Abdul Kalam's dream-destination: India as a knowledge superpower, in the first rank of nations. Our scientist-President - and one who was genuinely loved and admired across the masses - never measured success by material possessions. For him, the counterpoint to poverty was the wealth of knowledge, in both its scientific and spiritual manifestations. As a hero of our defence programme, he shifted horizons; and as a seer of the spirit, he sought to liberate doctrine from the narrow confines of partisan tension to the transcendental space of harmony.

Message From Mr. Narendra Modi, PM.

EVENTS

RENEWABLE ENERGY WORLD CONFERENCE & EXPO -ASIA-

Events Profile: ASEAN's Premier Power Conference keep up to date with the latest trends, issues and developments by regional and global expert speakers. Renewable Energy World Asia includes a world-class exhibition floor fill with many of the industry's largest players showcasing their latest technologies and innovations.
Date: 1st – 3rd September 2015
Venue: Impact Exhibition & Convention Centre, Bangkok, Thailand
Website: http://www.renewableenergyworld-asia.com/index.html

International Green Building Conference 2015 Singapore

Events Profile: The Singapore Green Building Week (SGBW) will play host to international green building experts, policy-makers, academics, built environment practitioners, tenants and end-users, including members of the public and students, for a congregation of ideas, collaboration, partnership and learning, to achieve a shared vision of a greener planet through the green building movement.
Date: 2nd – 4th September 2015
Venue: Marina Bay Sands, Singapore
Website: http://www.sgbw.com.sg/en

Sustainable Smart Cities India
3 - 4 September 2015 at Vivanta by Taj, Bengaluru, India

Events Profile: India faces rapid urbanization and the urban population set to rise by more than 400 million people by 2050. It is also estimated that in the next 15 years, the urban population will contribute nearly 75% to the India's GDP. The government has identified the need for creating well planned cities that can match and foster this growth.

Date: 3rd – 4th September 2015
Venue: Vivanta by Taj, Bengaluru, India
Website: http://nispana.com/ssci/

AUSTRALIAN SMART LIGHTING SUMMIT 2015

Events Profile: The 3rd Annual Australian Smart Lighting Summit is the premier platform for industry stakeholders to discuss strategies to improve energy efficiency, upcoming project opportunities, new technology, and regulations impacting the sector. The 2015 event will be a "meeting of the minds" offering highly valuable networking opportunities with the 'who's who' of Australia's lighting scene.

Date: 8th – 9th September 2015
Venue: Melbourne Convention & Exhibition Centre, Melbourne, VIC, Australia
Website: http://www.lightingconference.com.au/

EXPO Solar PV KOREA
KINTEX, Gyeonggi-Do(Seoul), Korea
September 9(WED.)~11(FRI.), 2015

Events Profile: Asia's largest solar energy exhibition, presents a glimpse of the changing dynamics in the global solar market and showcases latest technology and products including high-efficiency solar cells and cost-cutting manufacturing solutions.
Date: 9th – 11th September 2015
Venue: KINTEX Goyang, Gyeonggi-do (Seoul), Korea
Website: http://www.exposolar.org/2015/

EDITORIAL

Dear Members, Fellow Professionals, Friends and Well wishers,

Seasons Greetings and Best Wishes!!

"Happy Independence Day" and Seasons Greetings to One and All!

The month of July ended with the sad news of demise of "Bharat Rathna" Dr. A.P.J. Abdul Kalam, the former President of India, who was a Great Scientist, Eminent Engineer, Performing Head of many Institutions including the Republic of India, Patriot to the core, Visionary and above all a Model Human being, all rolled into one, with a very vast following of young and old in this Country. He had abundance of Knowledge, Love and Affection and vision to take this Country forward which he shared with all. An analysis of his life and Mission will show that he lead a pure and transparent life with great qualities and achievements but with absolute humility. Like Mahathma Gandhi, we can say that Kalam also has no parallel as he was an excellent blend of Respect for our Heritage and Faith in what Modern Science and Technology can do to ensure our Economic Growth and Preserve our Freedom. He believed and advocated a Second Green Revolution for this Country and spoke loudly about linking and use of all river waters in this Country for the welfare of all. As our elders say and seek, he was blessed with "Anayasena maranam" and breathed his last in the midst of students, as he would have certainly wished for. We humbly offer our Homage to him and Pray for his soul to rest in peace. His Mission and Vision will always guide the Youth of this Country to be Patriotic and work to Contribute.

August is always a month of celebration with the Historic Independence Day coming on the 15th of August. Since 1947 till date there have been lot of Progress in this Country and the words of Dr. Kalam are worth recalling in this aspect.

"Why are we in India so embarrassed to recognize our own strengths, our achievements? We are such a great nation. We have so many amazing success stories but we refuse to acknowledge them. Why?"

"We are the first in milk production.

We are number one in Remote sensing satellites.

We are the second largest producer of wheat.

We are the second largest producer of rice". There are many more such areas where growth has been remarkable.

We were one of the most powerful economies of the World for hundreds of years till about 300 years ago, and the rate of Progress and the Vision shows that we are in the process of regaining the same. There are debates whether **"Ache Din"** has come or not but the reality is that we are not able to realize it due to degradation of moral standards, increasing greed, visible poverty and inequality and we still continue to look like a 'dirty' Nation in all respects. **Dr. Kalam's life and mission could probably help us to get over this situation fast.**

We can feel proud that the month of August is also marked by the Celebration of **"Madras Day"**. The City of Madras or Chennai was founded on the 22nd August, 376 years ago and the Metro has grown not only to be a busy centre of National and International Business, but also grown to hold the Global Leadership in all forms of Fine Arts.

We thank all those members who have helped us by participating in the advertisements appearing for the issue July 2015 – Ashlok Safe Earthing Electrode Ltd., Faith Power Solutions - I.P.L. Products, The Motwane Mfg. Co. Pvt Ltd., DEHN India Pvt. Ltd., OBO Bettermann India Pvt. Ltd., Power Links, Galaxy Earthing Electrodes Pvt. Ltd., Abirami Electricals, Sun Sine Solution Pvt Ltd., Electrotherm India Ltd., Pentagon Switchgear Pvt. Ltd., P2 Power Solutions Pvt. Ltd., Ledgeo Ligts Pvt Ltd., FLIR Systems India Pvt Ltd., Supreme Power Equipment Pvt. Ltd., Cape Electric Pvt. Ltd., JL Seagull Power Products, Universal Earthing Systems Pvt. Ltd., Wilson Power and Distribution Technologies Pvt Ltd. ***EDITOR***

ELECTRICAL INSTALLATION ENGINEER

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MEMBERS DETAILS

S.No.	Company Name	License No.	District	Contact No.
76.	KSA Power Infra Pvt. Ltd	ESA 411	Chennai	044-42034399, 43114273
77.	Kumaran Industries	ESA 305	Chennai	044-22388265, 98400 37776
78.	Madras Electrical & Data Solutions	EA 2433	Chennai	044-43012110, 98409 28199
79.	Magna Enterprises	EA 1646	Chennai	044-42032732, 98409 51381
80.	Miccrotech Engineering Corporation	EA 2466	Chennai	044-22680220, 94440 70453
81.	Moon Power Systems	EA 2694	Chennai	044-43309444, 98403 94154
82.	MSC Enterprises	EA 2651	Chennai	044-26543356, 99520 90490
83.	Murugan Electrical Traders	ESA 240	Chennai	044-26423428, 98401 65659
84.	MV Power Consultants & Engineers Pvt. Ltd	ESA 207	Chennai	044-43563608, 98410 44221
85.	Nanjil Power	EA 2797	Chennai	044-25730354, 98405 83083
86.	Neutral Electricals	EA 2895	Chennai	044-22251285, 94455 53285
87.	P.V. Contracts & Electricals	ESA 194	Chennai	98400 64011, 86952 11999
88.	Philson Electric Co. P. Ltd.	EA 1865	Chennai	044-23740470, 94443 83271
89.	Power Care Enterprises	EA 2723	Chennai	044-23820003, 94442 79290
90.	Power Electricals Services	EA 2731	Chennai	86808 99862, 90803 11575

PROTERRA

Proterra was founded by Dale Hill in 2004 with a vision to design and manufacture world-leading, advanced technology heavy-duty vehicles powered solely by clean domestic fuels. After launching the first and most successful fleet of alternative fuel buses in the 1990s (the 16th Street Mall buses in Denver, CO, that are still running today), Hill formed Proterra to develop and deliver the "bus of tomorrow." With the launch of our first fast-charge bus the EcoRide, Proterra broke new ground and became the leading innovator of zero-emission commercial vehicle solutions. Extremely fuel-efficient and clean, Proterra's product helped transit agencies deliver quiet running, rider and neighbourhood-friendly vehicles that also meet government regulations and local mandates. In fact, Proterra was recognized by the California Air Resources Board as the first company to deliver a full-size transit vehicle to meet California's Zero-Emission Bus Rules. The EcoRide is also the first battery electric, zero-emissions bus to pass comprehensive Altoona testing for durability, safety, performance, maintainability and fuel economy.

Catalyst™ Platform

Our Catalyst™ 40-foot bus has built on the innovative heritage of the EcoRide and taken it to another level. Our TerraVolt™ Fast-Charge system is the world's first 40-foot battery-electric bus with fast-charge technology and can operate 24/7 without conventional refueling. It's also up to 500% more fuel-efficient than a typical diesel or CNG bus – resulting in tremendous operating cost savings. Using its on-route, fast-charging technology, Proterra has demonstrated that its electric bus can travel over 700 miles in a 24 hour period, alleviating customer concerns about limited range in Proterra's electric buses.

Our new product, the TerraVolt™ Extended-Range 40-foot bus, is built on the same Catalyst™ Fast-Charge platform. The TerraVolt™ Extended Range allows you to travel longer distances, able to store between 53 kWh and 321 kWh on a single charge. Rather than charging on-route, the TerraVolt™ Extended Range utilizes an in-depot charger once it's finished its deployment. Charging the bus off-peak hours increases the already impressive fuel savings.

While conventional diesel buses average 3.86 mpg (60.9 l/100 km), the Proterra Catalyst achieved the best overall average fuel consumption rating yet for a 40' transit bus at 22.16 MPGe (equivalent to 10.7 l/100 km) (1.70 kWh/mile). Nearly six times more efficient than a diesel or CNG bus, the Catalyst is also ~15% more energy efficient per mile than its closest competitor's electric bus on the same test (BYD, which averaged 1.988 kWh/mile), which translates to a lower lifetime energy consumption of 15%. Proterra's new 40' bus is more energy efficient per mile than most light-duty trucks and SUVs on the road today.

- Gradeability has been a historic obstacle for electric buses, which until now, weighed more and had less power, making steep inclines difficult if not impossible to climb. The Catalyst conquered a 15.5% grade, unprecedented in this test by an electric bus, making it an option to serve metropolitan areas with challenging topography in West Coast cities, including San Francisco and Seattle.
- Made of carbon fiber and advanced composite materials, Proterra's unibody design is a prime driver for its high performance with regard to weight and durability. With a curb weight of 27,370 lbs (12,415 kg), the Proterra Catalyst is not only lighter than any other electric bus, leading to greater efficiency, but is also more durable than buses made of aluminum or steel and less prone to corrosion. The transit industry has traditionally struggled with vehicle weight, especially for new technologies like hybrid, CNG and EV. By designing the vehicle from the ground-up, using the most advanced technology and materials, Proterra has eliminated the vehicle weight concern for EV.
- The Proterra 40 Catalyst also achieved 0-20 mph acceleration in 6.7 seconds. Rapid acceleration is particularly critical for keeping routes running on time, allowing bus operators to move in and out of traffic with greater ease.

The Proterra Catalyst drivetrain features a 220 kW peak permanent magnet drive motor delivering 678 N·m (500 lb-ft) of torque, coupled to the Proterra 2-speed auto-shift EV transmission. The bus is powered either by an advanced Lithium Titanate fast-charge energy storage pack or an NMC extended range energy storage system.

CALIFORNIA SET TO GIVE SOLAR PANELS TO LOW-INCOME FAMILIES FOR FREE

California is the best state in the country if you want to go solar – but only if you're rich enough. Due to the steep upfront costs of around $15,000, only those from middle- to upper-income families can afford to install solar arrays. A novel initiative is, however, looking to change that. This new project hopes to help disadvantaged communities see the sun in a different light.

Using money raised by the government to help fight global warming, the Grid Alternatives project aims to get polluting companies to pay for putting solar panels on the roofs of those who cannot afford them. According to the San Francisco Chronicle, the plan is to use the cap-and-trade money raised by the state from companies who have to pay per ton of carbon dioxide emitted. The cost to the disadvantaged families: nothing.

Grid Alternatives has been made project manager of the $162 million Single-family Affordable Solar Homes (SASH) project, the country's first dedicated solar repayment system for low-income families. They want to install solar arrays to over 1,600 homes by the end of next year. Using job-training programs and donations from solar companies, they aim to keep the costs as low as possible. Whilst it is totally free for the families getting them installed on their houses, they do ask that the families either offer to feed the crew, or help them install the panels.

The state government in California will use $14.7 million raised through the cap-and-trade system, aimed at curbing greenhouse gas emissions, to use toward installing solar arrays. In total, the cap-and-trade system has totted up to an impressive $1.6 billion.

By ploughing at least 10% of this money back into solar, the project aims to kill two birds with one stone – saving lower income families money, whilst also making big fossil fuel polluting companies help cut energy emissions in the state even further.

Anyone who is currently living in a neighbourhood in California that is classed as disadvantaged is qualified to apply to get the arrays installed. Grid Alternatives predicts that it could save individual families up to $1,000 a year, which they hope could then be spent on other essentials such as food.

KNOW THY POWER NETWORK – 95

From this month, let us venture into a new site titled "**Happiness Index for In Service Electrical Equipment"** with a common focus on its insulation, its characteristic features, operating environment of the equipment and its maintenance and finally its remaining life span. In its cover up, the condition monitoring tests, fault lines in insulation and diagnostic tests to confirm the weak spots / faults will also find place. It is not a new topic; yet it requires some focused streamlining so that the salient features of equipment insulation are easily channelled to the end users and practicing engineers. Hope you all will be pleased to walk with me on this journey.

You all know that an equipment is made up of many components which includes the costly insulation. To put it differently, it can be treated as an assembly of various essential components. So when you deal with the health aspects of an equipment or considering its life span (it includes its residual life) or finding out its happiness level, it is very important to have a close look at the health / integrity level of its vital components that constitute it i.e we have to probe / study the "health status" of its various components / and then combine the results together to get a whole / complete picture of the equipment health status. So you can learn the equipment operating life by joining the dots that relate to its operating environment, the quality of its input electrical power, quality and periodicity of its lubrications, cleanliness of its brushes, tightness of its belts and other maintenance related works.

An equipment works like a human being; it has its ups and downs and faces many difficult circumstances during its life time. Many a time, it may find its very survival itself will be a problem / difficult; yet it goes on working strenuously and sacrifices its life for our benefits / happiness. So I used to think / wonder whether we can create a "Happiness Index" for any equipments, especially for electrical equipment like motors and transformers. This step will facilitate us to see the **"Equipment Insulation through different perspectives"** that include its withstand quotient, residual life and happiness quotient. To deal with these, we need to look into their relief / freedom from the various adverse conditions experienced by them from abnormal operating environment. Poor power quality levels equipment mishandling, not permitting it to perform at its optimum levels, lack of maintenance and deviation from its normal operating procedures / practices, among other things. Satisfactory functioning of the equipment without loss of production or any desired output and the no of days / months of its trouble-free functioning is of great importance to us. Their readiness to function or their availability to give a problem – free performance will be the basic criteria for deciding their **"Happiness quotient or index"**. This calibrated scale may start from a low level to very high level (nearing 100%) of satisfactory performance as shown below. It is akin to intelligence / emotion quotient of human beings.

Fig 1 – SURVIVAL OR HAPPINESS SCALE INDEX OF AN ELECTRICAL EQUIPMENT

100	Very High Performance (Happy) Level
90	Good Performance Level (61 – 99)
80	
70	
60	Moderately Good Performance Level (31 – 60)
50	
40	
30	Very Low or Poor Performance Level (1 - 30)
20	
10	
0	Equipments death or Pass-out Level (0)

All these harmony levels / performance levels, among other things, depend on its voltage withstand level, current withstand levels, temperature withstand level and pollution withstand levels (including moisture ingress level).

In life, most of us take many things as granted; one of them relates to our dealing with electrical equipment. We feel that once these equipment are connected to the mains, they will work for ever or they will provide unending "trouble-free life". In reality, it is not so; it is totally different. Like human beings, these equipment have high / low (motivation) operating levels. In addition they have also "shelf" lives and expiry dates during their life span (say 10-25 years). We have to make them **"happy"** so that they can extend their share / quota of "trouble – free performance". Otherwise, these equipment may get off our hands and show their own colours at unexpected / untimely periods. But the point to be noted in this context is that we never think of this viz. an equipment's performance on the above lines. Only during Ayutha Pooja, we treat them as an embodiment of Devas a Gods; otherwise we never bring them in our thoughts / outlook. Further when they behave erratically or when we experience impacts / blockings to our daily routines or productivity, we think of their importance and health conditions. Then we take immediate remedial

actions. This kind of attitudes should change. So it needs our attention and corrective action. The main objectives of this article is to focus on the equipment's problem from various angles and perspectives and find solutions to it. Simply put, personify them as human beings and treat them in that level. *I sincerely feel that upon completion of this journey, you will become an Equipment Doctor or Equipment Physician and bring happiness or normalcy to the equipment whenever and wherever it is required.*

From the equipment's point of view, electrical energy forms, one of its main inputs. The concerned equipment converts it into other forms of energy like motive power and heating based on our requirements. We all know that the Electrical Energy is only a "carrier of energy" from the "Electricity Grid or Electricity Pool", where many energy sources like Thermal / Hydel / Nuclear power Stations, Wind Electric Generators and Solar Power Stations Pump their energy in the form of electricity. With the energy thus supplied by the electrons, the connected machines work and deliver their assigned outputs. But the problem is that the quality of incoming electrical power can make or hack the energy conversion process of the equipment. When its quality is good, the connected machines are happy and perform well; if it is of poor quality, then the machines will suffer / suffocate and loses its performance levels. At times it may lead to its reduction its life span or sudden death. So several / corrective actions are required to meet this situation brought by poor power quality. Similarly the poor withstand levels of equipment while facing live threatening over voltage surges can bring severe adverse impacts. Other operating conditions like temperatures that exceed the withstand levels of equipment insulation, higher pollution levels, significant presence of moisture, dust, oil and dirt cannot lag behind. These factors have also to be given the treatment they merit while dealing with equipment happiness.

Now let us see how an electrical equipment expresses its distress during adverse operating conditions.

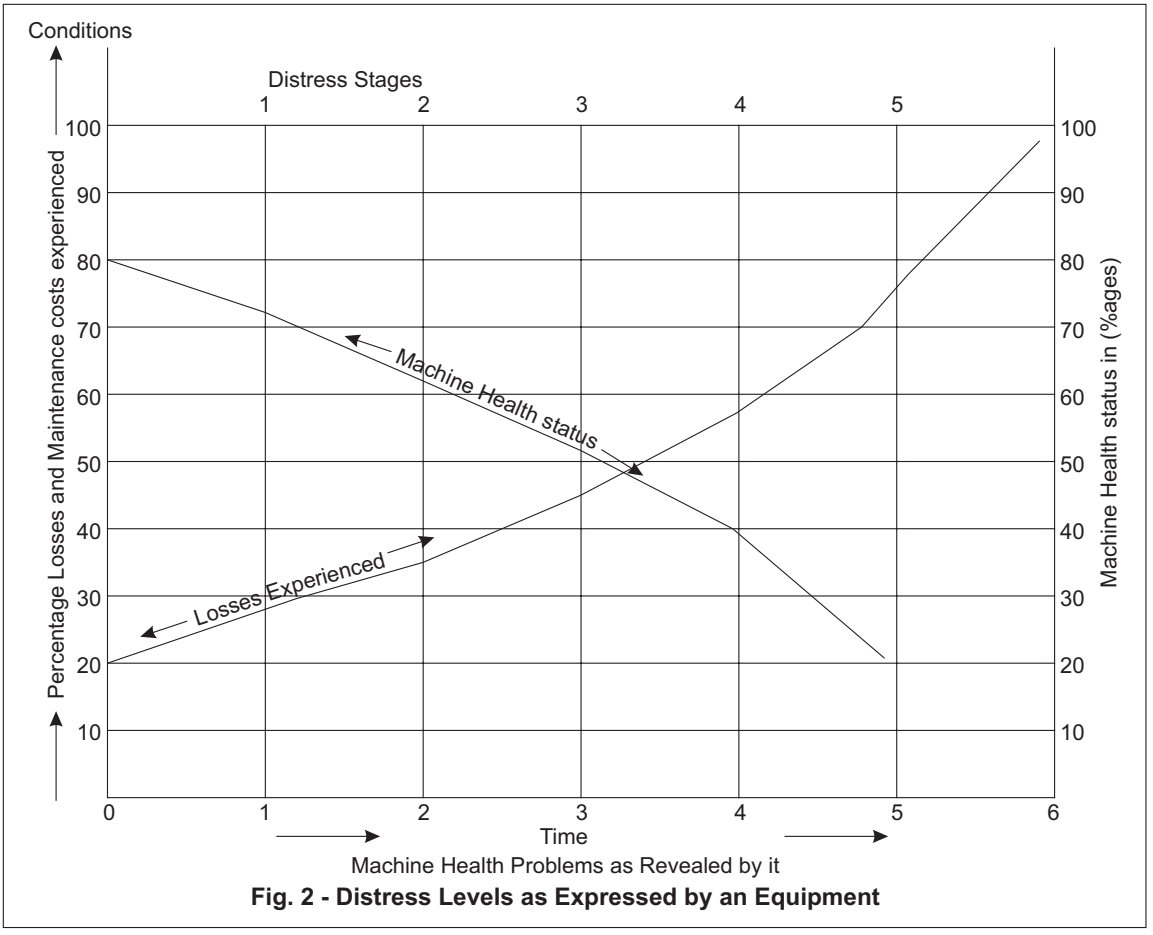

Fig. 2 - Distress Levels as Expressed by an Equipment

"DISTRESS LEVELS AS EXPRESSED BY AN EQUIPMENT"

Distress Stages

1 Beginning or incipient stage. (Heat) Infrared radiations are emitted
2 Vibrations
3 Changes in the characteristics of the lubricant (metal particles find a place)
4 Audible Noise
5 Visible fire with unbearable noise and wreckage

Having learnt the distress calls produced by an equipment while facing adverse operating conditions, now let us move to the topics that are going to be discussed in the coming issues.

1 Various tests undergone by the equipment during its life period starting from its design to its final end.

2 Various stages in the life of an equipment this includes the defects / fault lines noticed in it (it may be due to its inadequate design mishandling and incorrect / improper operation)

3 Its condition monitoring

4 Assessment of its health status and residual life. This covers its withstand capabilities under various levels of voltage, current temperature and pollutions

5 Prediction of its health status that includes its impregnating liquid if any used. From this we can assess its happiness or performance levels or quotient.

6 Prediction of its end

All these constitute the parts / components of the frame work of our study topic. It can also be compared to a garland made up of various types of flowers or costly stones like pearls. We can take one piece at the time from the above garland (one topic) for our probing and discussions.

Now it is time for me to conclude.

Next month topic: "Significance of Tests Conducted on Electrical Equipment"

Good Bye. Stay tuned till then.

(To be continued…)

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2020 நாயகனின் 20 பொன்மொழிகள்

விண்ணில் தொடர்ச்சியாய் பல சாதனைகள் நிகழ்த்திய விண்மீன், கடந்த வாரம் மண்ணுக்குள் ஒய்வெடுக்கச் சென்றுவிட்டது. அவரின் வாழ்வும் சரி, மறைவும் சரி, மாணவர்களுக்கு மத்தியில்தான். ஜாதிக்கொரு தலைவர், கொள்கைக்கொரு தலைவர், இருந்த காலத்தில் ஓட்டுமொத்த மாணவர் சமுதாயத்தின் தலைவராய் வாழ்ந்தார் கலாம். தன் உரைகளின் வழியே மாணவர் மனதில் அவர் விதைத்த விதைகள் வருங்காலத்தில் விருட்சமாய் வளர்ந்து நாட்டுக்கே நிழல் தரக்கூடும். அந்த 2020 நாயகனின் 20 பொன்மொழிகள் இங்கே:

1. வாழ்க்கை ஒரு சிரமமான விளையாட்டு, அதில் வெல்ல நீங்கள் இறுதிவரை மனிதனாய் இருத்தல் வேண்டும்.
2. உங்கள் கனவுகள் வெல்ல முதலில் நீங்கள் கனவு காணத்தொடங்கவேண்டும்.
3. மேலே பாருங்கள். மொத்த அண்டமும் நமக்கு துணையாய் இருக்கிறது. தங்கள் கனவை நோக்கி உழைப்பவர்களுக்கு வேண்டியதைச் செய்ய அண்டம் தயாராய் இருக்கிறது.
4. வாழ்க்கையில் வெல்ல நமக்கு மூன்று முக்கிய விஷயங்களை அடக்கி ஆளத் தெரிந்திருக்க வேண்டும். ஆசை, நம்பிக்கை, எதிர்பார்ப்பு ஆகிய மூன்றுமே அவை.
5. ஈடுபாடு இல்லாவிட்டால் வெற்றி பெற முடியாது. ஈடுபாடு இருந்தால் தோல்வி நெருங்காது.
6. எல்லா பறவைகளும் மழைநேரத்தில் அடைக்கலம் தேடி அலையும். ஆனால் கழுகுகள் மழை மேகங்களின் மேல் பறப்பதன் மூலம் தன்னைக் காப்பாற்றிக்கொள்ளும். இங்கே பிரச்சனைகள் பொதுவானவைதான். அதை அணுகும் முறையில் இருக்கிறது வித்தியாசம்.
7. கேள்வி கேட்பதுதான் கற்றலின் பிரதான குணாதிசயம். எனவே கேள்வி கேட்டுக் கொண்டே இருங்கள்.
8. ஒருவரை தோற்கடிப்பது எளிது. ஆனால் வெல்வது கடினம். இரண்டுக்குமான வேறுபாடை கவனமாய் கருத்தில் கொள்ளுங்கள்.
9. முதல் வெற்றிக்கு பின் ஓய்வெடுக்காதீர்கள். காரணம் உங்களின் இரண்டாவது முயற்சி தோல்வியடைந்தால் நீங்கள் அதிர்ஷ்டத்தால் முதல் முறை வெற்றி பெற்றதாக குற்றம் சொல்ல ஆயிரம் உதடுகள் காத்திருக்கின்றன.
10. தடைகள் எல்லாருக்கும் அவசியமானதாய் இருக்கின்றன. அவற்றைத் தாண்டி பெறும் வெற்றிதான் இனிக்கும்.
11. நிலையற்ற சிற்றின்பங்களின் பின்னால் ஓடுவதை நிறுத்திவிட்டு நிலையான சாதனைகளை செய்ய முனைப்பு காட்டுங்கள்.
12. திறமைகள் எல்லாருக்கும் ஒரே அளவாய் இருப்பதில்லை. ஆனால் திறமைகளை வளர்த்துக்கொள்ளும் வாய்ப்புகள் அனைவருக்கும் ஒரே அளவில்தான் இருக்கின்றன.
13. கனவு கண்டுகொண்டே இருங்கள். கனவு எண்ணங்களாய் மாறும். அந்த எண்ணங்கள் செயலை நோக்கி உங்களை செலுத்தும்.
14. வெற்றி – சிந்தனையே முதலீடு. முயற்சியே வழி. கடின உழைப்பே விடை.
15. துன்பங்கள் வெற்றியின் சாராம்சம்.
16. சூரியனைப் போல பிரகாசமாக ஆக முதலில் நாம் சூரியனைப் போல எரியத் தயாராய் இருக்க வேண்டும்.
17. ஊழலற்ற நாட்டை உருவாக்க மூன்று பேரின் கூட்டுமுயற்சி தேவை. தாய், தந்தை, ஆசிரியர் ஆகியோரே அந்த மூவர்.
18. நாம் பெறும் வெற்றிகள் தற்செயல் விபத்துகள் அல்ல. தொடர் முயற்சியின் பயன்கள்.
19. நம் அனைவருக்குள்ளும் ஒரு பெரு நெருப்பு இருக்கிறது. அந்த அக்னிக்கு சிறகுகள் கொடுத்து உலகில் ஒளி பரவச் செய்யுங்கள்.
20. நம் பிறப்பு ஒரு சம்பவமாய் இருக்கலாம். ஆனால் இறப்பு சரித்திரமாய் இருக்கவேண்டும்.

Compiled by Er. Ln. GS.Venugopal
Subash Electricals, Ambur, Vellore Dist.

WITH ABB'S HELP, SOLAR IMPULSE – AND SOLAR ELECTRICITY – ARE COMING TO MYANMAR

2015-03-19 - From NASA satellites in space, Myanmar appears as a dark area compared to the country's more-illuminated neighbours due to its lack of electrical lighting. ABB will help change that, via solar-powered rural electrification that will directly impact the lives of 3,000 people.

ABB is working to bring solar electricity to 10 communities in Myanmar, the latest step in the company's broader 15-year-old "Access to Electricity" program to expand rural electrification that not only boosts educational opportunities and improves healthcare in developing countries but helps strengthen vulnerable local economies.

The project, where ABB is working with non-profit Pact Myanmar, will establish solar battery charging stations run by women's groups in remote villages in the Tada Oo township in central Myanmar. Power from these stations will be sold to communities, bringing not merely electricity but economic self-sufficiency, entrepreneurship and equality - and safety.

"I am excited," said U Thein Hla, a 70-year-old resident from Wun Pa Tae Village. "Now, we don't need to worry about fire hazard associated with the use of candle light".

Villagers in Yay Htwet Gyi, a village near Mandalay, earn less than $1 day farming local crops such as betel leaves. ABB will bring access to solar generated electricity, making a difference to thousands, and positively impacting education, healthcare and quality of life. ABB photo/Mick Ryan

The project's launch comes as Solar Impulse landed in Mandalay on March 19 on the first-ever round-the-world journey powered by the sun.

ABB and Solar Impulse, likely to stay in Myanmar until next week before flying on to China, have an innovation and technology alliance that in conjunction with ABB's support of rural electrification in Myanmar demonstrates the potential of renewable energy in boosting economic growth while reducing resource consumption.

"I am very touched and excited about this project," Piccard said, after landing the Solar Impulse plane in Myanmar. "It demonstrates that ABB and Pact make our vision a reality".

Essential infrastructure

"Building up the energy infrastructure is essential to Myanmar's future economic and social progress," said Johan de Villiers, managing director of ABB in Singapore and Southeast Asia. "By supporting this grass-roots project, ABB will ensure that the communities around Mandalay will continue to benefit long after the Solar Impulse airplane has departed".

Solar Impulse leaves Varanasi in India bound for Myanmar, where ABB opened an office in 2014 and where the company is promoting rural electrification. It's Solar Impulse's fourth destination, on the solar-powered plane's flight around the world. Copyright: Solar Impulse | Revillard | Rezo.ch

In addition, the program backed by ABB and Pact Myanmar will provide financial support to villages so they can buy solar equipment at the community level.

This project is the latest in ABB's "Access to Electricity" rural electrification program, developed more than a decade ago as a response to the United Nations Global Compact that urged companies and organizations to provide greater assistance to least-developed countries.

No one is born hating another person because of the color of his skin, or his background, or his religion. People must learn to hate, and if they can learn to hate, they can be taught to love, for love comes more naturally to the human heart than its opposite. - **NELSON MANDELA**

Since becoming one of the first to enlist in the program, ABB has partnered with groups including in Rajasthan, India starting in 2005 to provide solar power for remote communities near Jodhpur.

Thousands benefit

In 2013, ABB expanded its commitment on the subcontinent to a village just across a river from Sundarbans National Parks, a United Nations' World Heritage-designated Royal Bengal tiger reserve, as part of a project that will not only help villagers but also protect endangered wildlife.

Access to electricity and reliable lighting will help the villagers, especially the young to study at night under a stable light source. Here, a child sits in a schoolhouse in Yay Htwet Gyi. ABB photo/Mick Ryan

Thousands of people are benefiting from these programs, including artisan weavers who have increased productivity and profit, school children who now have light to study by and people seeking assistance from medical clinics where the availability of electricity is improving and extending services.

And now in Myanmar, where ABB opened an office last year in Yangon after an absence of 20 years to help the country develop its infrastructure, it's estimated ABB's support of Pact Myanmar's Renewable Energy Fund will immediately provide 3,000 vulnerable people suffering from lack of electricity with power for their lighting, communication and health care needs.

"Students will be able to study at night," said Daw Kyi, a resident of Kyaung Kone Village, located about 130 kilometers west of Yangon. "This project promises a brighter future for our children".

According to the World Bank, more than three-quarters of Myanmar's 50 million residents have no access electricity.

Lighting the darkness

Myanmar is graced with beautiful pagodas that are one of the hallmarks of the country's majority Buddhist religion, including the golden Shwedagon Pagoda that lights up the city center of Yangon.

Part of the project involves establishing solar battery charging stations to be run by women's groups in remote villages thus encouraging economic self-sufficiency and entrepreneurship. Here, local women gather formally in Yay Htwet Gyi, just one of the villages where ABB will initiate an access to electricity solar program to touch the lives of thousands. ABB photo/Mick Ryan

From NASA satellites, however, the country appears far darker than its better-illuminated neighbours who are experiencing the benefits of electrification in both rural and urban areas.

ABB aims to underscore how technology and innovation, via projects like this and its endeavor with Solar Impulse, offer the best opportunities for all communities to tackle energy challenges – whether it's bringing electricity with fewer losses and greater efficiency from remote renewables installations to urban areas or simply powering a radio that fills rural villagers' lives with music.

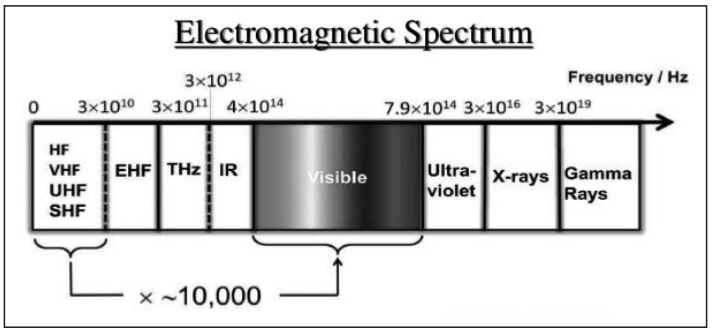
"Whether it is on a small rural community level, nationally, or internationally, we have shown that the possibilities for decoupling economic growth from energy consumption and environmental pollution are very real," de Villiers said.

Courtesy: ABB

LI-FI TECHNOLOGY

What is Li-Fi technology?

Li-Fi technology is a ground-breaking light-based communication technology, which makes use of light waves instead of radio technology to deliver data.



Li-Fi can compensate as the radio spectrum becomes overloaded

Using the visible light spectrum, Li-Fi technology can transmit data and unlock capacity which is 10,000 times greater than that available within the radio spectrum.

The visible light spectrum is plentiful, free and unlicensed, mitigating the radio frequency spectrum crunch effect.

The future internet

Li-Fi technology will in future enable faster, more reliable internet connections, even when the demand for data usage has outgrown the available supply from existing technologies such as 4G, LTE and Wi-Fi. It will not replace these technologies, but will work seamlessly alongside them.

Using light to deliver wireless internet will also allow connectivity in environments that do not currently readily support Wi-Fi, such as aircraft cabins, hospitals and hazardous environments.

Light is already used for data transmission in fibre-optic cables and for point to point links, but Li-Fi is a special and novel combination of technologies that allow it to be universally adopted for mobile ultra high speed internet communications.

A dual use for LED lighting

The wide use of solid state lighting offers an opportunity for efficient dual use lighting and communication systems.

Innovation in LED and photon receiver technology has ensured the availability of suitable light transmitters and detectors, while advances in the modulation of communication signals for these types of components has been advanced through signal processing techniques, such as multiple-input-multiple-output (MIMO), to become as sophisticated as those used in mobile telecommunications.

An integrated communication solution

Li-Fi technology is being developed into a ubiquitous systems technology, consisting of application specific combinations of light transmitters, light receivers including solar cells, efficient computational algorithms and networking capabilities that can be deployed in a wide range of communication scenarios and in a variety of device platforms.

The following Li-Fi research projects, involving members and collaborators of the Li-Fi Research and Development Centre, provide research background on activity currently underway.

Research Projects

Processor Automated Synthesis by iTerative Analysis (PASTA-2)

Processor Automated Synthesis by iTerative Analysis (PASTA-2) brings together research in microprocessor design, software, signal processing, and the important emerging application area of Li-Fi. The overall objective of the PASTA-2 project is to investigate new and novel methods of automating the design of embedded systems to enable the timely creation of future generations of high-performance low-power digital appliances.

Ultra-Parallel Visible Light Communications (UP-VLC)

Ultra-Parallel Visible Light Communications (UP-VLC) is an ambitious project, funded through an EPSRC Programme Grant, which will explore the transformative technology of communications in an imaginative and foresighted way. The vision is built on the unique capabilities of gallium nitride (GaN) optoelectronics to combine optical communications with lighting functions, and especially on the capability to implement new forms of spatial multiplexing, where individual elements in high-density arrays of GaN based light emitting diodes (LEDs) provide independent communications channels, but can combine as displays.

Tackling the Looming Crisis in Wireless Communication

Proposes radical new solutions to the looming “spectrum crisis”, whereby the demand for data sent through wireless networks increases far faster than the necessary bandwidth can be made available. Recent advancements in light emitting diode (LED) device technology now seems to let the vision of using light for high speed wireless

communications become a reality. By using the visible and infrared spectrum to supplement the r.f. spectrum, there are potential large overall performance improvements when wireless systems can select their transmission medium autonomously and in a dynamic as well as self-organising fashion.

Towards Ultimate Communication Network Convergence (TOUCAN)

Towards Ultimate Communication Network Convergence (TOUCAN) will develop a unified information-driven ICT architecture, where seamless and flexible use of heterogeneous network resources and end devices will optimally interconnect any users, machines and data sets. A service driven approach will provide solutions that consider global resiliency and security issues, and aims to alleviate bottlenecks in capacity, connectivity, spectrum utilization, resource and energy efficiency, and will address Quality of Service and Quality of Experience metrics across the end-to-end communications paths.

The Li-Fi market context for Li-Fi is driven by several major trends.

1) The risks of a spectrum crunch

We are running out of existing bandwidth to support growth in internet usage

- Internet video traffic is growing at a rate of 48% per annum.
- More video is uploaded to YouTube in a day than was broadcast by all three major US TV networks in the last three years (Forbes Magazine, 2012).
- YouTube and Netflix now account for 50% of all internet traffic (Sandvine Report, 2013).
- Wi-Fi and mobile communications both operate within the radio frequency (r.f.) part of the electro-magnetic spectrum, and this has a limited capacity that will eventually be overwhelmed by the growth in traffic already in process.

2) The introduction of LED lighting

Solid State lighting is set to become all pervasive

- In just three years the market for LED lighting has grown by a factor of 3.5 (Strategies in Light conference, 2012).
- It is estimated that in 2014, LEDs will secure 24% of the lighting market and a value reaching £15.3 billion ($26 billion).
- Solid state lighting enables intelligent lighting, with sensors and controls set to be worth £1.8 billion ($3 billion) by 2020.
- LED lighting is being increasingly deployed in automotive and street lighting, as well as in domestic, retail and industrial contexts.

3) The need for green technology solutions

Low Power, Low Carbon, Green Networking Solutions are Essential

- The Information and Communication Technology (ICT) sector contributes around 2% of total Green House Gas (GHG) emissions, set to grow as other sectors achieve efficiencies and ICT becomes more prevalent (An Inefficient Truth, Global Action Plan Report, 2007).
- Networking components are projected to contribute around 40% of the total ICT GHG emissions (GSMA: Mobile Green Manifesto, 2009).
- In 2010, the communication infrastructure accounted for approximately 15.6 billion kWh of energy consumption within data centres worldwide (J.Koomey, 2011).
- Communication functions typically consume around 50% of the power of mobile devices.
- In general Wi-Fi is up to a factor of 3x more efficient than 3G networks with combination networks providing significant energy benefits (Balasubramanian, *et al.*, 2009).

4) Increased concerns over cyber security

Radio frequency signals can be readily intercepted

- In 2010, £4.7 trillion ($8 trillion) worth of global commerce was transacted via the internet (McKinsey Global Institute Report, 2011).
- The cost of cyber-crime to the UK has been estimated to be of the order of £27 billion ($45.9 billion) per year.
- The UK Government has set aside £650 million ($1.1 billion) over four years for a National Cyber Security Programme.

The Critical National Infrastructure can be more robust if access points leak less signal.

5) The Internet of Things

The Internet of Things will revolutionize all aspects of the modern world

- The Future Internet is predicted to bring between £50-100 billion ($85-170 billion) annual benefit to the UK alone (ICT KTN Future Internet Report, 2011).
- The Internet of Things will make pervasive connections across previously unconnected services, machines, businesses and individuals.
- Digital data is growing at a CAGR of 57%, and increasingly this data needs to be directly accessed by end users.
- The Internet of Things will affect how cities are managed, businesses run, finance is conducted and how items are manufactured.
- One of the enabling components is wireless connectivity, and Li-Fi will allow high bandwidth wireless connections to be easily made.

Li-Fi offers immediate benefits towards each of the above trends

1. The visible light spectrum is plentiful, free and unlicensed, mitigating the r.f. spectrum crunch effect.
2. The wide use of solid state lighting offers an opportunity for efficient dual use lighting and communication systems.
3. Li-Fi is more power efficient than radio technologies.
4. Li-Fi signals are less prone to leakage beyond their intended environment, so offering increased security.
5. Li-Fi will enable many more "Things" to be connected to the Internet, diversifying and increasing the number of available applications.

Benefits of Li-Fi

The benefits of Li-Fi emerge as a result of unlocking the vast amount of license-free and secure electromagnetic spectrum that lies in the infrared and visible light regions.

Benefits of Li-Fi

The key benefits are:

- Enhanced wireless infrastructures by providing an additional layer of small cells ('attocells');
- The avoidance of the radio frequency spectrum crunch (10,000 times more capacity);
- Enabling very high peak data rates (10 Gbps)
- The enabling of the Internet-of-Things (100 times more devices)
- Significantly enhanced secure wireless communication (reduced interception of signals)
- Enhanced energy-efficiency by combining data communication and illumination (100 times energy reduction)
- Complete elimination of health concerns

Applications of Li-Fi

Li-Fi applications are varied as a result of its key features, such as directional lighting, energy efficiency, intrinsic security, high data rate capability, signal blocking by walls and integrated networking capability.

Each light fixture in the application environment becomes a separate data channel. These channels can supply different data into each separate pool of light, delivered at the full rated download speed for that channel.

Security

In a meeting room environment, the access area of each channel is the width of the light pool, and can be accessed by multiple users. Each user can receive higher data rates than would be the case for an equivalent Wi-Fi channel. In the Wi-Fi case, each user or group of users directly competes for access to bandwidth. The net result is that the more connections there are, the slower the download speeds are for all. By contrast, in the case of Li-Fi, with its greater number of available access points, each pool of light provides full channel data rates with fewer simultaneous users. The overall net benefit to each user is up to 1000 times greater speeds. In addition, and in contrast to radio waves, the light does not pass through the walls. Therefore, with minimal precautions to avoid leakage from windows, etc., security is fundamentally enhanced as compared with Wi-Fi.

Dense urban environments

Dense urban environments by their nature tend to have complete artificial lighting coverage. This lighting infrastructure can provide always available high data rate access for users as they move through that environment. For example, along a hotel corridor or reception hall a number of users can receive high data rate downloads at any point. Moreover, high speed wireless communication would be available in every room since the light waves

do not propagate through walls. This results in interference-free wireless communication, and spectrum does not have to be shared among a large number of users in the rooms.

Cellular communication

In external urban environments, the use of Li-Fi enabled street lamps would provide a network of internet access points. In cellular communication, the distance between radio base stations has come down to about 200-500 metres. So, instead of deploying new radio base stations in our cities, street lamps could provide both, illumination during night, and high speed data communication 24/7. Surprisingly, even when the lights are off as perceived by the eye, full data communication rates are still possible. There is also an additional cost benefit as installing new radio base stations usually comes with large cost – for installation and site lease.

EMI sensitive environments

On aircraft, Li-Fi enabled lighting will allow high data rate connectivity for each passenger. It will allow connectivity at all times, without creating electromagnetic interference (EMI) with sensitive radio equipment on the flight deck. The reduction in cabling requirement also means a lighter aircraft.

Augmented reality

Exhibits in museums and galleries are illuminated with specific lighting. Li-Fi enabled lighting can provide localised information within that light. This means that a visitor's camera or mobile phone can be used to download further information regarding the object being viewed from the light that illuminates the exhibit.

Localised advertising

By using shop display lighting as a Li-Fi broadcast channel, it is possible to transmit advertising information on the goods being viewed, as well as say special offers and coupons. This will allow the merging of the high street and online shopping experience, and provide novel retail business models to emerge. Catalogue information, discount coupons, and advertising videos could all be provided to shoppers.

Underwater communication

Radio waves are quickly absorbed in water, preventing underwater radio communications, but light can penetrate for large distances. Therefore, Li-Fi can enable communication from diver to diver, diver to mini-sub, diver to drilling rig, etc.

Safety environments

In explosion hazard environments, the use of electrical equipment, including mobile phones, is generally greatly restricted. The use of Li-Fi to pass data will simplify the configuration of data networks in such environments, and can enable new systems to enhance security in these environments.

Intelligent transportation systems

Car headlights and tail lights are steadily being replaced with LED versions. This offers the prospect of car-to-car communication over Li-Fi, allowing development of anti-collision systems and exchange of information on driving conditions between vehicles. Traffic lights already use LED lighting, so that there is also the prospect offered of city wide traffic management systems. This would enable car systems to download information from the network and have real time information on optimal routes to take, and update the network regarding conditions recently experienced by individual vehicles.

Connectivity

Our homes already have lighting widely installed. The use of Li-Fi enabled lighting will transform the applications that can be envisaged, not only the interconnection of devices, such as televisions, computers and Hi-Fi, but also connecting ordinary domestic appliances, such as fridges, washing machines, microwaves and vacuums. The "internet of everything".

Sensitive data

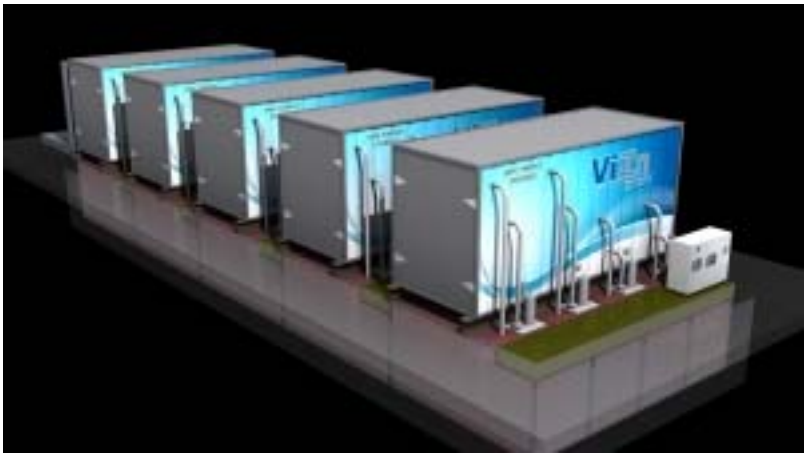
Hospitals are a specific case of an environment where both EMI sensitivity and security of data are issues. Li-Fi can enable the better deployment of secure networked medical instruments, patient records, etc.

Indoor navigation

By identifying each light (for example, through the use of the widely used MAC codes used by data routers and computers) it is possible to provide a smart means of navigating through urban environments. The identification of each code would be linked to a specific location. For example, light received from the closest fixture can indicate to a mobile user their exact position as they travel along a corridor.

Dream is not what you see in sleep, is the thing which does not let you sleep.
Dr. A.P.J. ABDUL KALAM

VIZN ENERGY: A NEW FLOW BATTERY CONTENDER IN THE GRID-SCALE STORAGE RACE



For years, battery technology startups and researchers have been striving to create a rechargeable, grid-scale energy storage system using zinc, one of the world's cheapest and most plentiful metals. Zinc-based batteries tend to break down after just hundreds of charge-discharge cycles, however — and coming up with new technology innovations to overcome this remains a challenge.

Take the example of ViZn Energy Systems, a startup with a zinc-iron flow battery it's now putting to the test in grid-scale applications. For the past four years, ViZn (pronounced "vision") has been busy turning a fundamental weakness of its alkaline-based electrolyte chemistry into a key advantage.

Founded in 2009 as Zinc Air Inc., the Columbia Falls, Mont.-based startup changed its name in September and launched its first commercial-scale product, an 80-kilowatt, 160-kilowatt-hour zinc redox flow battery housed in a 20-foot shipping container. It also announced its first deployment with BlueSky Energy for an Austrian microgrid project, aimed at storing and balancing on-site solar generation.

In March, ViZn announced that Kalispell, Mont.-based utility Flathead Electric Cooperative had installed a second system, meant to test a variety of grid support services. And this week, grid energy storage software and systems startup Greensmith named ViZn as one of the battery providers it's working with at grid scale.

ViZn's Z20 systems are targeting a price point of $800 per kilowatt-hour for microgrid systems, Kirk Plautz, vice president of sales, in a July interview. The company's longer-term goal is to put together five of these containers in a 1-megawatt, 3 megawatt-hour system, the GS200, with a "clear path" to reducing those costs to about $450 per kilowatt-hour at scale, he said.

That's on par with the costs being targeted by other flow battery competitors, whether they're using vanadium, iron-chromium or zinc-bromine chemistries. Flow batteries pump electrolyte through electrochemical cells, and thus can add more tanks of electrolyte to expand their energy capacity, something sealed batteries can't do. They aren't as efficient as the latest lithium-ion batteries, however, and can't compete on how much power they're able to deliver at any one time.

One of ViZn's key differentiators is its use of an alkaline, rather than acidic, electrolyte to get the job done. That alkaline chemistry, developed over the course of nearly a decade of research at Lockheed Martin, was aimed at avoiding the dendrite formation and subsequent failure common to acidic-based zinc battery chemistries.

Instead of spiky dendrites, the alkaline electrolyte led to a "clumping" of by product materials on the battery electrodes. That in turn led to its own set of problems for cycle life in closed battery systems, ultimately prompting Lockheed to put the technology on hold.

But for flow batteries, this "clumping" had the unintended side effect of increasing the power density of the system, by increasing the surface area upon which electrochemical reactions could occur. That allows ViZn's flow batteries to ramp up to higher power more quickly than many other flow batteries, while still retaining the multi-hour energy storage advantages the technology provides.

"We leveraged this weakness in the chemistry," through licensing of the core patents from Lockheed, Wilkins said. "Lockheed spent eight years and $10 million on the chemistry," he said. "All we had to do is commercialize it."

ViZn's website notes that its "low-cost, non-acid" and low-temperature chemistry allows the use of inexpensive construction materials, and that it has built battery stacks with "proprietary elements to deal with the shunt issues historically afflicting flow batteries." The company also claims the potential for 10,000 cycles and a 20-year lifespan, critical factors for investments that need to run for years in order to pay for themselves.

ViZn has raised about $20 million to date, mostly from private investors, which has allowed the company to deploy its first systems working with manufacturing partners like Semitool, the Kalispell, Mont.-based

semiconductor chemical processing equipment maker bought by Applied Materials in 2009. ViZn's new CEO Ron Van Dell told Bloomberg in July that the company is now seeking up to $25 million, with hopes of ramping up manufacturing capacity in late 2014 and early 2015.

To be sure, ViZn isn't the only flow battery startup promising key improvements in chemistry, engineering and manufacturing processes. Nor is it the only contender promising a zinc-based grid storage alternative — startup Eos Energy is now testing its aqueous electrolyte zinc batteries, which it hopes to bring to market at a cost of $160 per kilowatt-hour.

California's 1.3-gigawatt grid energy storage mandate is creating major new opportunities for batteries that can store energy for multiple hours at a time. Lithium-ion batteries are already providing power-centric grid services in projects around the world and are starting to be deployed for multi-hour applications as well. But flow batteries are getting their own share of business for long-duration storage — and adding some power density to the mix could allow them to provide both types of services, Wilkins noted. As with all grid-scale energy storage efforts, the proof will come in the real-world deployments.

About the Company:

ViZn Energy Systems provides micro-grid scale energy storage solutions to operators of utilities, thin-grids and island grids that have a significant renewable energy production component. Our products deliver a uniquely safe, reliable and scalable energy system. The result is a 20 year profit-producing solution with rapid ROI.

GENERATE ELECTRICITY AND ENJOY THE VIEW

Richard Lunt, assistant professor of chemical engineering and materials science at the Michigan State University (MSU) College of Engineering, received a 2015 Innovation of the Year Award in April 2015 from the MSU Innovation Center for the development of transparent photovoltaics (PV). Previous attempts to produce transparent PV resulted in materials that colored or dimmed the light that passed through them. The technology Lunt and his team developed is clear and can be installed on nearly any transparent surface without affecting incoming light.

Michigan State University doctoral student Yimu Zhao holds a transparent luminescent solar concentrator module. Image: Yimu Zhao

The transparent luminescent solar concentrator (LSC) is a flexible and inconspicuous means of harvesting solar energy that can be used on buildings, cell phones, car windows, and any other device that has a clear surface. It uses small organic molecules to absorb specific nonvisible wavelengths of sunlight but allow natural visible light to pass through. The solar energy is converted to electricity by thin photovoltaics strips.

Other members of the MSU research team include Yimu Zhao, an MSU doctoral student in chemical engineering and materials science; Benjamin Levine, assistant professor of chemistry; and Garrett Meek, doctoral student in chemistry.

Lunt worked as a postdoctoral associate at the Massachusetts Institute of Technology (MIT) after earning his Ph.D. at Princeton University in 2010. In 2011, he cofounded Ubiquitous Energy Inc. with MIT colleagues to commercialize the technology for a variety of applications.One benefit of this new technology is its flexibility. Although it's at an early stage of development, it has the potential to be scaled to commercial or industrial applications affordably. Ubiquitous Energy is working on improving the material's energy-producing efficiency.

Currently, the prototype produces a solar conversion efficiency close to 1%, and the best colored LSC has an efficiency of around 7%. According to the Ubiquitous Energy website, two-thirds of the light available for energy harvesting is in the ultraviolet and the infrared, which should make practical efficiencies of more than 10% possible while maintaining up to 90% visible transparency.

To bring its ClearViewPowerTM technology to market, Ubiquitous Energy has established prototyping and pilot production capabilities in Silicon Valley. Non-toxic, readily available materials are deposited using industry-standard vacuum deposition techniques and the low-temperature deposition process can be used on rigid or flexible substrates. Ubiquitous Energy is currently working with commercial partners to develop engineering and product prototypes for its first applications in mobile and distributed electronics. ***Courtesy: Solar Today***

CLIMATE THREAT AS GRAVE A RISK AS NUCLEAR WAR

An international scientific report commissioned by the UK government says the risks of climate change are comparable to those posed by nuclear conflict.

The UK government says that climate change poses risks that demand to be treated as seriously as the threat of nuclear war.Scientists from the UK, US, India and China say in a report commissioned by the UK that deciding what to do about climate change depends on the value we put on human life, both now and in years to come.

One of the lead authors of the report is Sir David King, formerly the UK government's chief scientist, who last month co-authored a report on the scale of investment that should be made to move from fossil fuels to renewable energy by 2025.

In a foreword to the latest report, Baroness Anelay, a minister at the British foreign office, writes that assessing the risks surrounding nuclear disarmament and non-proliferation means understanding inter-dependent elements " including what science says is possible, what other countries may intend, and systemic factors such as regional power dynamics.

"The risk of climate change demands a similarly holistic assessment," she says.

Value human life

She concludes: "How much do we care about the effects of climate change? How important is it that we act to avoid them? What probability of their occurrence can we tolerate?…The answers to these questions depend in part on how we value human life – both now, and in the future."

The report is not the first to put climate chaos and nuclear devastation in the same category of risk, but its sponsorship by one of the world's nuclear powers is eloquent.

It says the most important political decision is how much effort to exert on countering climate change, taking into account what we are doing to the climate, how it may respond, what that could do to us, and what we might then do to each other.

The authors' best guess, based on current policies and trends, is that greenhouse gas emissions will keep going up for another few decades, and then either level off or slowly decline.

This, they say, is for two reasons: governments are not making maximum use of the technologies already available; and technology is not yet progressing fast enough to give governments the policy options they will need. In the worst case, emissions could keep on rising throughout the century.

They warn that how the climate may change, and what that could do to us, are both highly uncertain. "The important thing to understand is that uncertainty is not our friend," the report says. "There is much more scope to be unlucky than there is to be lucky."

High emissions pathway

The report foresees wide ranges of possible global temperature and sea level increase. On a high emissions pathway, it says, where the most likely temperature rise is estimated at 5°C by 2100, anything from 3°C to 7°C may be possible.On this pathway, the chances of staying below 3°C will become "vanishingly small", but the chances of exceeding 7°C will increase and could become more likely than not within the next century.The authors see very little chance that global sea level rise will slow down, and every chance that it will accelerate. The only question is by how much.

"While an increase of somewhere between 40cm and 1m looks likely this century, the delayed response of huge ice-sheets to warming means we may already be committed to more than 10m over the longer term. We just do not know whether that will take centuries or millennia."

A temperature increase of 4°C or more could pose very large risks to global food security, and to people.Humans have limited tolerance for combinations of high temperature and humidity. Their upper limits of tolerance are rarely if ever exceeded by climatic conditions alone, but with temperature increase somewhere between 5°C and 7°C, it starts to become likely that hot places will experience conditions that are fatal even for people lying down in the shade.Population growth alone is also likely to double the number of people living below a threshold of extreme water shortage by mid-century.

Sea level thresholds

Coastal cities, according to the report, probably have thresholds in terms of the rate and extent of sea level rise that they can deal with, but we have very little idea where those thresholds are.The authors say that even the 0.8°C of climate change experienced so far is now causing us significant problems, and that "it seems likely that high degrees of climate change would pose enormous risks to national and international security" " for example, through extreme water stress and competition for productive land.In a highly topical passage, they say migration

from some regions may become more a necessity than a choice, and could happen on a historically unprecedented scale.

"The capacity of the international community for humanitarian assistance, already at full stretch, could easily be overwhelmed," the report warns.The risks of state failure could rise significantly, affecting many countries simultaneously, and even threatening those currently considered developed and stable.

But the report is not relentlessly downbeat. "An honest assessment of risk is no reason for fatalism," it says. "Just as small changes in climate can have very large effects, the same can be true for changes in government policy, technological capability, and financial regulation… the goal of preserving a safe climate for the future need not be beyond our reach."

Courtesy: Eco Business

HANKOOK TIRE'S FUTURE-ORIENTED TIRE SUCCEEDS HIGH-SPEED DRIVING WITHOUT AIR PRESSURE

Hankook Tire announced that it had successfully completed its ride and handling tests for its latest non-pneumatic tire (NPT) HankookiFlex, which is made using eco-friendly materials.

The iFlex is the latest example of Hankook Tire's continued technology leadership. The company's ability to push the boundaries of driving capabilities is a direct result of its robust foundation in R&D as well as the following world-class technological prowess.

As the name suggests, NPTs do not require air pressure. Hankook Tire has continued researching on the new tire technologies particularly for NPT since 2011. Crucially, the company has been working toward the development of NPTs that achieve all of the practical benefits of conventional air pressure tires while simultaneously enhancing their high speed tire characteristics. The iFlex, which is the fifth NPT concept tire that Hankook Tire has released, is the culmination of that effort.

The company put the iFlex through a serious of rigorous tests designed to push the tires to their limits in five categories: durability, hardness, stability, slalom (zigzag) and speed. In the speed test, the electric car equipped with iFlex tires reached 130km/h. The impressive results in all five categories demonstrated that the NPTs could match conventional tires in terms of performance. At the same time, these results are expected to help the company solidify its position as a global top-tier tire company and, give new momentum to its future-oriented R&D capabilities.

Construction of the iFlex is centered on a new type of uni-material designed to maximize the tire's eco-friendly potential. From a manufacturing standpoint, the material used during product construction significantly enhances the energy efficiency. From a product standpoint, the material allows the iFlex to be recycled with greater ease. Hankook Tire then went one step further, integrating new tire construction techniques to simplify the manufacturing process from eight stages to just four, thus further reducing the company's carbon footprint.

"The HankookiFlex's ability to deliver the perfect high-speed driving performance is the result of Hankook Tire's longstanding commitment to independently developing progressive, innovative tire technology. Aiming to strengthen our technological leadership in the global tire market, we will continue to develop cutting edge eco-friendly and future-oriented tires" says Mr. Seung-HwaSuh, Vice Chairman and CEO of Hankook Tire.

Hankook Tire currently has a number of projects underway that are centered on developing future-oriented tire products. For example, 'The Next Driving Lab,' a brand campaign that was initiated in 2013, is operated primarily to let talented engineers and designers bring to life their wildest futuristic dreams for innovative driving experiences. Likewise, Hankook Tire collaborates every two years with world-renowned design schools to host the 'Design Innovation' project. This project allows students to propose and study future tire concepts designed at generating safer, more reliable, and more advanced tire performances.

NEW "SMART WINDOW" MATERIAL SELECTIVELY BLOCKS LIGHT AND/OR HEAT

In an effort to improve the energy efficiency of building, researchers have sought to develop windows that change transparency to let more light – and therefore heat – through when it's cold, and less when it's hot. Unfortunately, these methods tend to impede the passage of visible light, some by tinting panes and others by complete obscuration. But a team at the Cockrell School of Engineering at The University of Texas at Austin has developed a "smart window" technology that allows the passage of light while blocking heat, or vice versa.

Two years ago, Delia Milliron and her team produced a "smart" glass coating that could block visible light, near-infrared light (NIR), or both. By embedding indium tin oxide (ITO) nanocrystals in glass imbued with niobium oxide, the research team created an electrochromic material that's able to transmit or block light depending on the electric potential applied.

The team's advancements on their previous research have led to the creation of electrochromic materials that can selectively permit the passage of light, while blocking heat (cool mode) and, conversely, block light while allowing the transfer of heat (warm mode). These new materials allows control of up to 90 percent of NIR and 80 percent of visible light. And since switching between modes takes mere minutes instead of hours, as was the case with the previously-reported material, commercialized products may be closer at hand.

In order to make this new electrochromic material practical, the researchers structured the components into a single, porous, interpenetrating network. This design provides channels for electronic and ionic change, thereby enabling selective blocking of light and/or NIR through different applied voltages. Milliron and her team demonstrated a proof-of-concept that achieves optical control properties from a single-component film. They are now working toward methods suitable for low-cost manufacturing.

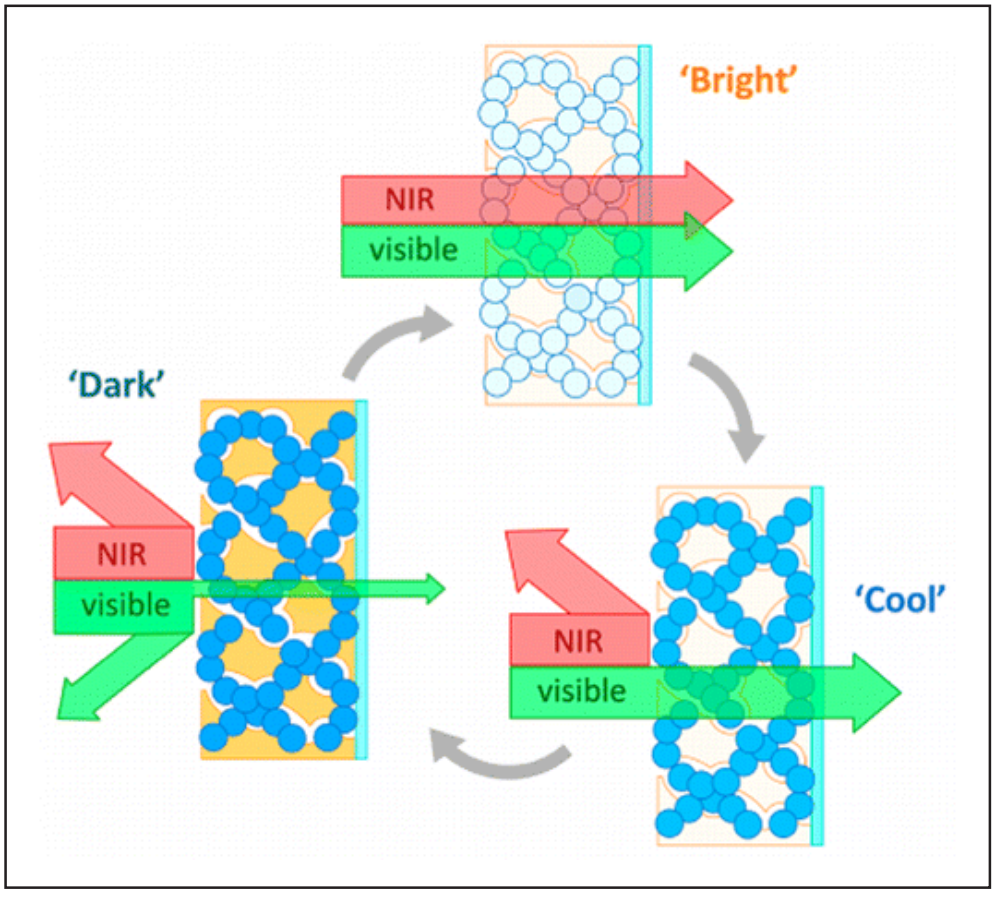


Illustration of different possible modes for this latest "smart window" technology

"These two advancements show that sophisticated dynamic control of sunlight is possible," Milliron said. "We believe our deliberately crafted nanocrystal-based materials could meet the performance and cost targets needed to progress toward commercialization of smart windows."

The research was published in the *Journal of the American Chemical Society*.

POWERING ENGINEERS THROUGH TRAINING – L & T

The Switchgear Training Centres have been set up with an aim to impart knowledge related to the selection, application, installation, operation and maintenance of Low and Medium Voltage switchgear, Industrial and Building Automation products. Depending on the kind of professional enrolled and course content, the programmes involve a blend of classroom sessions, practical training and case studies. These programmes offer participants an invaluable experience, thereby promoting good engineering and management practices among Electrical and Automation professionals, panel builders, project professionals and electrical consultants.

CODE	PROGRAMME NAME	DAYS	AUG 2015	SEP 2015	OCT 2015	FEES Rs.
LT 01	**SELECTION OF LV SWITCHGEAR AND APPLICATIONS** Need for switchgear, LV switchgear terminologies, product standards, fault current calculation for LV system, Selection & application of low voltage switchgears - like contactors, thermal overload relays, motor starters.	5	3-7		12-16	**14000**
LT 02	**BEST MAINTENANCE PRACTICES IN LV SWITCHGEAR** Safety & good maintenance practices, complete hands-on workshop sessions on testing, troubleshooting & maintenance of low voltage switchgear.	5		7-11		**12500**
LT 03	**BREAKER MAINTENANCE WORKSHOP - C POWER ACB** Thorough hands-on training on C-Power range of Air Circuit Breakers, testing, setting & programming of various types of ACB microprocessor based protection releases like SR-71/SR21i.	3			5-7	**6750**
LT 04	**BREAKER MAINTENANCE WORKSHOP - U POWER OMEGA ACB** - Complete hands-on training on U-Power Omega range of air circuit breakers. Including pole assembly replacement, Fixing & testing of various accessories. Testing, setting & programming of various types of microprocessor based releases.	2			8-9	**4500**
LT 05	**SWITCHBOARD ELECTRICAL DESIGN** - Introduction to various standards for LV switchboard assembly including IEC 61439, types of panels, forms of seperation, fault current calculations as applicable to low voltage switchgear, bus bar selection & design.	3		2-4		**10000**
LT 06	**POWER DISTRIBUTION IN BUILDINGS** Design parameters relevant to large buildings. Procedure for load estimation; sizing of transformers and DG sets. Sizing of Low Voltage switchgears.	3				**10000**
LT 07	**ELECTRICAL SAFETY** - Basics – Safety, Importance of Safety, Electrical Safety, Types of Hazards, Fire, Shock, Effects of Fire and Shock, Safety in Residences, Safety in Industrial and Commercial premises.	1	24			**2500**
LT 08	**SELECTION & APPLICATION OF DRIVES** - Basics of LV motors, inverter duty motor, basics of LV AC VFDs, selection & application of AC VFDs, wiring diagram, parameter setting, salient features, energy conservation with AC VFDs, VFD vs soft starter. Classroom sessions supported by workshop demonstrations.	3	24-26			**10000**
LT 09	**REACTIVE POWER & HARMONICS MITIGATION** What is PF, types of LV capacitors, selection criteria, power factor improvement - concepts, methods & advantages, APFC panels, dynamic compensation.	2				**6750**
LT 10	**INTRODUCTION TO MEDIUM VOLTAGE SWITCHGEAR** Selection & application of vacuum circuit breaker, specification of vacuum circuit breaker, fault current calculation, vacuum vs SF6 as a medium of CB.	2				**6750**
LT 11	**INDUSTRIAL PROTECTION WITH NUMERICAL RELAYS** Introduction to protective relaying, terminologies,	4				**12500**

CODE	PROGRAMME NAME	DAYS	AUG 2015	SEP 2015	OCT 2015	FEES Rs.
	ANSI codes, CTs, PTs, Fault current calculations, relay co-ordination, feeder protection, motor protection, transformer protection, generator protection.					
LT 12	**CONSERVATION & MANAGEMENT OF ELECTRICAL ENERGY** Importance of energy conservation & management, fundamental concepts of ECM, terminologies, software, energy efficient technologies in electrical installations, Energy Conservation Act, ECBC, etc. including some case studies.	2				**6750**
LT 13	**REQUIREMENT OF SYSTEM & EQUIPMENT EARTHING** - Need & purpose of earthing, various types & methods of earthing, selection of earthing system, system & equipment earthing, sizing of earth conductors, generator earthing, transformer earthing, earthing of sensitive electronic equipment.	2				**8000**
LT 14	**INTRODUCTION TO INDUSTRIAL ELECTRICAL SYSTEMS** Overview of Indian power system, typical industrial electric power distribution scheme, classroom sessions with workshop demonstrations giving exposure to a wide range of low voltage switchgear like contactors.	3	10-12, 19-21	21-23, 28-30	19-21	**3000**
LT 15	**FIRE DETECTION & SECURITY SOLUTIONS** - Basics of Fire Alarm System, Conventional & Addressable FAS, Field devices, Panels & Software, Design / BOQ from Floor plans.	1	27			**3500**
LT 16	**BUILDING MANAGEMENT & ENERGY MANAGEMENT SYSTEMS** - Basics of BMS, Components of BMS, Input & output devices, Controllers & Software, Installation & Commissioning, Energy Saving and Green building certification through BMS, Basics of Energy management, hardware and software features.	1	28			**3500**
LT 17	**SELECTION, PROTECTION & MAINTENANCE OF TRANSFORMER** - Selection, Classification, Operation of Power and Distribution transformer, Vector groups, Transformer protections, Routine tests for transformer, Testing of transformer oil, Transformer maintenance, Earthing of transformer, relevant IS/IEC standards.	2	13-14			**6750**
LT 18	**INDUSTRIAL ELECTRICIAN TRAINING PROGRAMME** - Safety & good maintenance practices, hands-on workshop sessions on testing, troubleshooting & maintenance of low voltage switchgear such as contactors, overload relays, motor starters, switch disconnector fuse, good termination practices.	2			26-27	**2000**
LT 19	**ELECTRICIAN TRAINING PROGRAMME FOR RESIDENTIAL BUILDINGS** - Basics of electricity, Selection of MCB, ELCB, domestic Switches, Wires and accessories e.g. Time switch, Introduction to Distribution boards, wiring demo staircase , godown lighting etc.	1			28	**1000**
LT 20	**SWITCHGEAR SELECTION - MOTOR CONTROL CENTRE (MCC)** - Motor control and protection techniques, Selection of Controlgear product range includes Contactor, O/L Relay, starter - Type-2 coordination.	2		22-23		**5500**
LT 21	**SWITCHGEAR SELECTION - POWER CONTROL CENTRE (PCC)** LV Power distribution, Latest trends and selection of ACB, MCCB, SDF, Changeover and related accessories.	2		24-25		**5500**
LT 22	**DESIGN OF CONTROL CIRCUITS** - Control Circuits & Schemes Fundamental Graphical Symbols & Nomenclatures of Various Components, Guidelines for Control Circuit Diagram.	2			29-30	**6750**

For more information about the Training Calendar and programmes.

Contact:- **Coonoor** Larsen & Toubro Limited Switchgear Training Centre, Ooty-Coonoor Main Road Yellanahalli P.O., The Nilgiris - 643 243 Tel. : 0423 251 7107 Fax : 0423 251 7158 E-mail: stc-coonoor@Lntebg.com.

Dr. A.P.J. ABDUL KALAM (1931 – 2015)

Dr. A.P.J. Abdul Kalam at the International Book Fair, Trivandrum, 2014

Early life and education

Avul Pakir Jainulabdeen Abdul Kalam was born on 15 October 1931 to a Tamil Muslim family in Rameswaram in the State of Tamil Nadu. His father's name was Jainulabudeen, a boat owner, and his mother Ashiamma, a housewife. His father owned a ferry that took Hindu pilgrims back and forth between Rameswaram and the now-extinct Dhanushkodi. Kalam was the youngest of four brothers and one sister in his family. He came from a poor background and started working at an early age to supplement his family's income. After completing school, Kalam distributed newspapers to contribute to his father's income. In his school years he had average grades but was described as a bright and hardworking student who had a strong desire to learn and spend hours on his studies, especially mathematics. After completing his education at the Ramanathapuram Schwartz Matriculation School, Kalam went on to attend Saint Joseph's College, Tiruchirappalli, then affiliated with the University of Madras, from where he graduated in physics in 1954.

He moved to Madras in 1955 to study aerospace engineering in Madras Institute of Technology. While Kalam was working on a senior class project, the Dean was dissatisfied with his lack of progress and threatened to revoke his scholarship unless the project was finished within the next three days. Kalam met the deadline, impressing the Dean, who later said to him, "I was putting you under stress and asking you to meet a difficult deadline". He narrowly missed achieving his dream of becoming a fighter pilot, as he placed ninth in qualifiers, and only eight positions were available in the IAF.

Career as a scientist

After graduating from the Madras Institute of Technology in 1960, Kalam joined the Aeronautical Development Establishment of the Defence Research and Development Organisation (DRDO) as a scientist. He started his career by designing a small helicopter for the Indian Army, but remained unconvinced by his choice of a job at DRDO. Kalam was also part of the INCOSPAR committee working under Vikram Sarabhai, the renowned space scientist. In 1969, Kalam was transferred to the Indian Space Research Organisation (ISRO) where he was the project director of India's first Satellite Launch Vehicle (SLV-III) which successfully deployed the *Rohini* satellite in near-earth orbit in July 1980; Kalam had first started work on an expandable rocket project independently at DRDO in 1965. In 1969, Kalam received the government's approval and expanded the programme to include more engineers.

Dr. A.P.J. Abdul Kalam addresses engineering students at IIT Guwahati

In 1963–64, he visited NASA's Langley Research Center in Hampton, Virginia; Goddard Space Flight Center in Greenbelt, Maryland; and Wallops Flight Facility. Between the 1970s and 1990s, Kalam made an effort to develop the Polar Satellite Launch Vehicle (PSLV) and SLV-III projects, both of which proved to be successful.

Kalam was invited by Raja Ramanna to witness the country's first nuclear test Smiling Buddha as the representative of TBRL, even though he had not participated in its development. In the 1970s, Kalam also directed two projects, *Project Devil* and *Project Valiant*, which sought to develop ballistic missiles from the technology of the successful SLV programme. Despite the disapproval of the Union Cabinet, Prime Minister Indira Gandhi allotted secret funds for these aerospace projects through her discretionary powers under Kalam's directorship. Kalam played

an integral role convincing the Union Cabinet to conceal the true nature of these classified aerospace projects. His research and educational leadership brought him great laurels and prestige in the 1980s, which prompted the government to initiate an advanced missile programme under his directorship. Kalam and Dr V S Arunachalam, metallurgist and scientific adviser to the Defence Minister, worked on the suggestion by the then Defence Minister, R. Venkataraman on a proposal for simultaneous development of a quiver of missiles instead of taking planned missiles one after another. R Venkatraman was instrumental in getting the cabinet approval for allocating INR 388 crores for the mission, named Integrated Guided Missile Development Programme (IGMDP) and appointed Kalam as the chief executive. Kalam played a major part in developing many missiles under the mission including Agni, an intermediate range ballistic missile and Prithvi, the tactical surface-to-surface missile, although the projects have been criticised for mismanagement and cost and time overruns.

Kalam served as the Chief Scientific Adviser to the Prime Minister and the Secretary of the Defence Research and Development Organisation from July 1992 to December 1999. The *Pokhran-II* nuclear tests were conducted during this period in which he played an intensive political and technological role. Kalam served as the Chief Project Coordinator, along with Rajagopala Chidambaram, during the testing phase. Media coverage of Kalam during this period made him the country's best known nuclear scientist. However, the director of the site test, K Santhanam, said that the thermonuclear bomb had been a "fizzle" and criticisied Kalam for issuing an incorrect report. Both Kalam and Chidambaram dismissed the claims.

In 1998, along with cardiologist Soma Raju, Kalam developed a low cost coronary stent, named the "Kalam-Raju Stent". In 2012, the duo designed a rugged tablet computer for health care in rural areas, which was named the "Kalam-Raju Tablet".

Presidency

Kalam served as the 11th President of India, succeeding K. R. Narayanan. He won the 2002 presidential election with an electoral vote of 922,884, surpassing the 107,366 votes won by Lakshmi Sahgal. His term lasted from 25 July 2002 to 25 July 2007.

On 10 June 2002, the National Democratic Alliance (NDA) which was in power at the time, expressed that they would nominate Kalam for the post of President, and both the Samajwadi Party and the Nationalist Congress Party backed his candidacy. After the Samajwadi Party announced its support for Kalam, Narayanan chose not to seek a second term in office, leaving the field clear. Kalam said of the announcement of his candidature:

I am really overwhelmed. Everywhere both in Internet and in other media, I have been asked for a message. I was thinking what message I can give to the people of the country at this juncture.

On 18 June, Kalam filed his nomination papers in the Indian Parliament, accompanied by Vajpayee and his senior Cabinet colleagues.

Dr. A.P.J. Abdul Kalam along with Vladimir Putin and Manmohan Singh during his presidency

The polling for the presidential election began on 15 July 2002 in Parliament and the state assemblies, with the media claiming that the election was a one-sided affair and Kalam's victory was a foregone conclusion; the count was held on 18 July. Kalam became the 11th president of the Republic of India in an easy victory, and moved into the Rashtrapati Bhavan after he was sworn in on 25 July. Kalam was the third President of India to have been honoured with a Bharat Ratna, India's highest civilian honour, before becoming the President. Dr Sarvepalli Radhakrishnan (1954) and Dr Zakir Hussain (1963) were the earlier recipients of Bharat Ratna who later became the President of India. He was also the first scientist and the first bachelor to occupy Rashtrapati Bhawan.

During his term as president, he was affectionately known as the *People's President*, saying that signing the Office of Profit Bill was the toughest decision he had taken during his tenure. Kalam was criticised for his inaction in deciding the fate of 20 out of the 21 mercy petitions submitted to him during his tenure. Article 72 of the Constitution of India empowers the President of India to grant pardons, and suspend or commute the death sentence of

convicts on death row. Kalam acted on only one mercy plea in his five-year tenure as president, rejecting the plea of rapist Dhananjoy Chatterjee, who was later hanged. Perhaps the most notable plea was from Afzal Guru, a Kashmiri terrorist who was convicted of conspiracy in the December 2001 attack on the Indian Parliament and was sentenced to death by the Supreme Court of India in 2004. While the sentence was scheduled to be carried out on 20 October 2006, the pending action on his mercy plea resulted in him remaining on death row. He also took the controversial decision to impose President's Rule in Bihar in 2005.

In September 2003, in an interactive session in PGI Chandigarh, Kalam supported the need of Uniform Civil Code in India, keeping in view the population of the country.

At the end of his term, on 20 June 2007, Kalam expressed his willingness to consider a second term in office provided there was certainty about his victory in the 2007 presidential election. However, two days later, he decided not to contest the Presidential election again stating that he wanted to avoid involving Rashtrapati Bhavan from any political processes. He did not have the support of the left parties, Shiv Sena and UPA constituents, to receive a renewed mandate.

Nearing the expiry of the term of the 12th President Pratibha Patil on 24 July 2012, media reports in April claimed that Kalam was likely to be nominated for his second term. After the reports, social networking sites witnessed a number of people supporting his candidature. The BJP potentially backed his nomination, saying that the party would lend their support if the Trinamool Congress, Samajwadi Party and Indian National Congress proposed him for the 2012 presidential election. A month ahead of the election, Mulayam Singh Yadav and Mamata Banerjee also expressed their support for Kalam. Days afterwards, Mulayam Singh Yadav backed out, leaving Mamata Banerjee as the solitary supporter. On 18 June 2012, Kalam declined to contest the 2012 presidential poll. He said of his decision not to do so:

Many, many citizens have also expressed the same wish. It only reflects their love and affection for me and the aspiration of the people. I am really overwhelmed by this support. This being their wish, I respect it. I want to thank them for the trust they have in me.

Post-presidency

After leaving office, Kalam became a visiting professor at the Indian Institute of Management Shillong, the Indian Institute of Management Ahmedabad, and the Indian Institute of Management Indore; an honorary fellow of Indian Institute of Science, Bangalore; chancellor of the Indian Institute of Space Science and Technology Thiruvananthapuram; professor of Aerospace Engineering at Anna University; and an adjunct at many other academic and research institutions across India. He taught information technology at the International Institute of Information Technology, Hyderabad, and technology at Banaras Hindu University and Anna University.

Dr. A.P.J. Abdul Kalam at Bijnor a week before his death

In May 2012, Kalam launched a programme for the youth of India called the *What Can I Give Movement*, with a central theme of defeating corruption. He also enjoyed writing Tamil poetry and playing the veenai, a South Indian string instrument. Kalam listened to Carnatic devotional music every day and believed in the Hindu culture. Kalam used to read Bhagavad Gita and was a vegetarian. He was nominated for the MTV Youth Icon of the Year award in 2003 and 2006. In the 2011 Hindi film *I Am Kalam*, Kalam is portrayed as a positive influence on a poor but bright Rajasthani boy named Chhotu, who renames himself Kalam in honour of his idol.

In 2011, Kalam was criticised by civil groups over his stand on the Koodankulam Nuclear Power Plant; he supported the establishment of the nuclear power plant and was accused of not speaking with the local people. The protesters were hostile to his visit as they perceived to him to be a pro-nuclear scientist and were unimpressed by the assurances provided by him regarding the safety features of the plant.

Death

On 27 July 2015, Kalam travelled to Shillong to deliver a lecture on "Creating a Livable Planet Earth". at the Indian Institute of Management Shillong. At around 6:35 p.m. IST, only five minutes into his lecture, he collapsed. He was rushed to the nearby Bethany Hospital in a critical condition; upon arrival, he lacked a pulse or any other signs of life. Despite being placed in the

intensive care unit, Kalam was confirmed dead of a sudden cardiac arrest at 7:45 p.m IST.

Following his death, Kalam's body was airlifted in an Indian Air Force helicopter from Shillong to Guwahati, from where it was flown to New Delhi on the morning of 28 July in an air force C-130J Hercules. The flight landed at Palam Air Base and was received by the President, the Prime Minister, Chief Minister of Delhi Arvind Kejriwal, and the three service chiefs of the Indian Armed Forces, who laid wreaths on Kalam's body. His body was then placed on a gun carriage draped with the Indian flag and taken to his Delhi residence at 10 Rajaji Marg where the public and numerous dignitaries paid homage, including former prime minister Manmohan Singh, Congress president Sonia Gandhi, Rahul Gandhi, and Uttar Pradesh Chief Minister Akhilesh Yadav.

On the morning of 29 July, Kalam's body, wrapped in the Indian flag, was taken to Palam Air Base, from where it was flown to Madurai in an air force C-130J aircraft, arriving at Madurai Airport that afternoon. His body was received at the airport by the three service chiefs and national and state dignitaries, including cabinet ministers Manohar Parrikar, Venkaiah Naidu, Pon Radhakrishnan; and the governors of Tamil Nadu and Meghalaya, K Rosaiah and V. Shanmuganathan. After a brief ceremony, Kalam's body was flown in an air force helicopter to the town of Mandapam. From Mandapam, Kalam's body was taken in an army truck to his hometown of Rameswaram, where it was displayed in an open area in front of the local bus station to allow the public to pay their final respects until 8 p.m. that evening.

On 30 July 2015, the former President was laid to rest at Rameswaram's Pei Karumbu Ground with full state honours. Over 350,000 people attended the last rites, including the Prime Minister, the governor of Tamil Nadu and the chief ministers of Karnataka, Kerala and Andhra Pradesh.

Reactions

India reacted to Kalam's death with an outpouring of grief; numerous tributes were paid to the former President across the nation and on social media. The Government of India declared a seven-day state mourning period as a mark of respect. President Pranab Mukherjee, Vice President Hamid Ansari, Home Minister Rajnath Singh, and other leaders condoled the former President's demise. Prime Minister Narendra Modi said "his [Kalam's] death is a great loss to the scientific community. He took India to great heights. He showed the way." Former Prime Minister Dr. Manmohan Singh, who had served as prime minister under Kalam, said, "our country has lost a great human being who made phenomenal contributions to the promotion of self reliance in defence technologies. I worked very closely with Dr. Kalam as prime minister and I greatly benefited from his advice as president of our country. His life and work will be remembered for generations to come." ISRO chairman A. S. Kiran Kumar called his former colleague "a great personality and a gentleman", while former chairman G. Madhavan Nair described Kalam as "a global leader" for whom "the downtrodden and poor people were his priority. He always had a passion to convey what is in his mind to the young generation", adding that his death left a vacuum which none could fill.

South Asian leaders expressed condolences and lauded the late statesman. The Bhutanese government ordered the country's flags to fly at half-staff to mourn Kalam's death, and lit 1000 butter lamps in homage. Bhutanese Prime Minister Tshering Tobgay expressed deep sadness, saying Kalam "was a leader greatly admired by all people, especially the youth of India who have referred to him as the people's President". Bangladesh Prime Minister Sheikh Hasina described Kalam as "a rare combination of a great statesman, acclaimed scientist, and a source of inspiration to the young generation of South Asia" and termed his death an "irreparable loss to India and beyond". Bangladesh Nationalist Party chief Khaleda Zia said "as a nuclear scientist, he engaged himself in the welfare of the people". Ashraf Ghani, the President of Afghanistan, called Kalam "an inspirational figure to millions of people," noting that "we have a lot to learn from his life". Nepalese Prime Minister Sushil Koirala recalled Kalam's scientific contributions to India: "Nepal has lost a good friend and I have lost an honoured and ideal personality." The President of Pakistan, Mamnoon Hussain, and Prime Minister of Pakistan Nawaz Sharif also expressed their grief and condolences on his passing. The President of Sri Lanka, Maithripala Sirisena, also expressed his condolences. "Dr. Kalam was a man of firm conviction and indomitable spirit, and I saw him as an outstanding statesman of the world. His death is an irreparable loss not only to India but to the entire world." The Commander-in-Chief of the Myanmar Armed Forces, Senior General Min Aung Hlaing, expressed condolences on behalf of the Myanmar government. The Dalai Lama expressed his sadness and offered condolences and prayers, calling Kalam's death "an irreparable loss".

Kathleen Wynne, the Premier of Ontario, which Kalam had visited on numerous occasions, expressed "deepest condolences ... as a respected

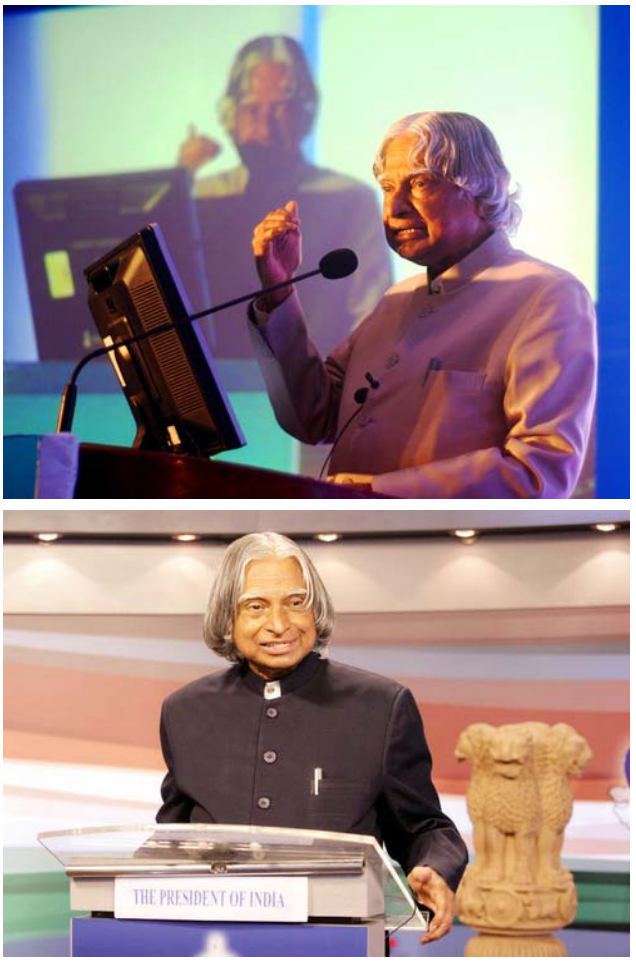
scientist, he played a critical role in the development of the Indian space program. As a committed educator, he inspired millions of young people to achieve their very best. And as a devoted leader, he gained support both at home and abroad, becoming known as 'the people's President'. I join our Indo–Canadian families, friends, and neighbours in mourning the passing of this respected leader." United States President Barack Obama extended "deepest condolences to the people of India on the passing of former Indian President Dr. APJ Abdul Kalam", and highlighted his achievements as a scientist and as a statesman, notably his role in strengthening U.S.–India relations and increasing space cooperation between the two nations. "Suitably named 'the People's President', Dr. Kalam's humility and dedication to public service served as an inspiration to millions of Indians and admirers around the world."

Russian President Vladimir Putin expressed sincere condolences and conveyed his sympathy and support "to the near and dear ones of the deceased leader, to the government, and entire people of India". He remarked on Kalam's outstanding "personal contribution to the social, economic, scientific, and technical progress of India and in ensuring its national security," adding that Dr. Kalam would be remembered as a "consistent exponent of closer friendly relations between our nations, who has done a lot for cementing mutually beneficial Russian–Indian cooperation." Other international leaders—including former Indonesian president Susilo Bambang Yudhoyono, Malaysian Prime Minister Najib Razak, Singaporean Prime Minister Lee Hsien Loong, President of the United Arab Emirates Sheikh Khalifa bin Zayed Al Nahyan, and Vice President and Prime Minister of the United Arab Emirates and emir of Dubai Sheikh Mohammed bin Rashid Al Maktoum—also paid tribute to Kalam.

Writings

In his book *India 2020*, Kalam strongly advocated an action plan to develop India into a "knowledge superpower" and a developed nation by the year 2020. He regarded his work on India's nuclear weapons programme as a way to assert India's place as a future superpower.

I have identified five areas where India has a core competence for integrated action: (1) agriculture and food processing; (2) education and healthcare; (3) information and communication technology; (4) infrastructure, reliable and quality electric power, surface transport and infrastructure for all parts of the country; and (5) self-reliance in critical technologies. These five areas are closely inter-related and if advanced in a coordinated way, will lead to food, economic and national security.



Dr. A.P.J. Abdul Kalam delivering speech

Kalam describes a "transformative moment" in his life when he asked Pramukh Swami, the guru of the BAPS Swaminarayan Sampradaya, how India might realize this five-pronged vision of development. Pramukh Swami's answer—to add a sixth area developing faith in God and spirituality to overcome the current climate of crime and corruption—became the spiritual vision for the next 15 years Kalam's life, which he describes in his final book, *Transcendence: My Spiritual Experiences with Pramukh Swamiji*, published just a month before his death.

It was reported that there was considerable demand in South Korea for translated versions of books authored by him.

Kalam took an active interest in other developments in the field of science and technology, including a research programme for developing biomedical implants. He also

supported open source technology over proprietary software, predicting that the use of free software on a large scale would bring the benefits of information technology to more people.

Kalam set a target of interacting with 100,000 students during the two years after his resignation from the post of scientific adviser in 1999. He explained, "I feel comfortable in the company of young people, particularly high school students. Henceforth, I intend to share with them experiences, helping them to ignite their imagination and preparing them to work for a developed India for which the road map is already available."

Awards and honours

Kalam has received honorary doctorates from 40 universities. The Government of India has honoured him with the Padma Bhushan in 1981 and the Padma Vibhushan in 1990 for his work with ISRO and DRDO and his role as a scientific advisor to the Government. In 1997, Kalam received India's highest civilian honour, the Bharat Ratna, for his contribution to the scientific research and modernisation of defence technology in India. In 2013, he was the recipient of the Von Braun Award from the National Space Society "to recognize excellence in the management and leadership of a space-related project".

Year of award or honour	Name of award or honour	Awarding organisation
2014	Doctor of Science	Edinburgh University,UK
2012	Doctor of Laws (Honoris Causa)	Simon Fraser University
2011	IEEE Honorary Membership	IEEE
2010	Doctor of Engineering	University of Waterloo
2009	Honorary Doctorate	Oakland University
2009	Hoover Medal	ASME Foundation, USA
2009	International von Kármán Wings Award	California Institute of Technology, USA
2008	Doctor of Engineering (Honoris Causa)	Nanyang Technological University, Singapore
2008	Doctor of Science (Honoris Causa)	Aligarh Muslim University, Aligarh
2007	Honorary Doctorate of Science and Technology	Carnegie Mellon University
2007	King Charles II Medal	Royal Society, UK
2007	Honorary Doctorate of Science	University of Wolverhampton, UK
2000	Ramanujan Award	Alwars Research Centre, Chennai
1998	Veer Savarkar Award	Government of India
1997	Indira Gandhi Award for National Integration	Indian National Congress
1997	Bharat Ratna	Government of India
1994	Distinguished Fellow	Institute of Directors (India)
1990	Padma Vibhushan	Government of India
1981	Padma Bhushan	Government of India

Books and documentaries

Kalam's writings

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- *India 2020: A Vision for the New Millennium* by A P J Abdul Kalam, Y. S. Rajan; New York, 1998.
- *Wings of Fire: An Autobiography* by A P J Abdul Kalam, Arun Tiwari; Universities Press, 1999.

- *Ignited Minds: Unleashing the Power Within India* by A P J Abdul Kalam; Viking, 2002.
- *The Luminous Sparks* by A P J Abdul Kalam, by; Punya Publishing Pvt Ltd, 2004.
- *Mission India* by A P J Abdul Kalam, Paintings by Manav Gupta; Penguin Books, 2005
- *Inspiring Thoughts* by A P J Abdul Kalam; Rajpal & Sons, 2007
- *Indomitable Spirit* by A P J Abdul Kalam; Rajpal and Sons Publishing
- *Envisioning an Empowered Nation* by A P J Abdul Kalam with A Sivathanu Pillai; Tata McGraw-Hill, New Delhi
- *You Are Born To Blossom: Take My Journey Beyond* by A P J Abdul Kalam and Arun Tiwari; Ocean Books, 2011.
- *Turning Points: A journey through challenges* by A P J Abdul Kalam; Harper Collins India, 2012.
- *Target 3 Billion" by A P J Abdul Kalam and Srijan Pal Singh; December 2011 | Publisher Penguin Books.*
- *My Journey: (titled எனது பயணம் - Tamil) Transforming Dreams into Actions* by A P J Abdul Kalam; August 2013 by the Rupa Publication.
- *A Manifesto for Change: A Sequel to India 2020* by A P J Abdul Kalam and V Ponraj; July 2014 by Harper Collins.
- *Forge your Future: Candid, Forthright, Inspiring* by A P J Abdul Kalam; by Rajpal and Sons, 29 October 2014.
- *Reignited: Scientific Pathways to a Brighter Future* by A P J Abdul Kalam and Srijan Pal Singh; by Penguin India, 14 May 2015.
- *Transcendence: My Spiritual Experiences with Pramukh Swamiji* by A P J Abdul Kalam with Arun Tiwari; Harper Collins Publishers, June 2015

Biographies

- *Eternal Quest: Life and Times of Dr Kalam* by S Chandra; Pentagon Publishers, 2002.
- *President A P J Abdul Kalam* by R K Pruthi; Anmol Publications, 2002.
- *A P J Abdul Kalam: The Visionary of India* by K Bhushan, G Katyal; A P H Pub Corp, 2002.
- *A Little Dream* (documentary film) by P. Dhanapal; Minveli Media Works Private Limited, 2008.
- *The Kalam Effect: My Years with the President* by P M Nair; Harper Collins, 2008.
- *My Days With Mahatma Abdul Kalam* by Fr A K George; Novel Corporation, 2009.

Dreams
is not what you see in sleep
is the thing which doesn't let you sleep

– Dr. A.P.J. Abdul kalam

ENERGY CONSERVATION THROUGH ENERGY EFFICIENCY – 6

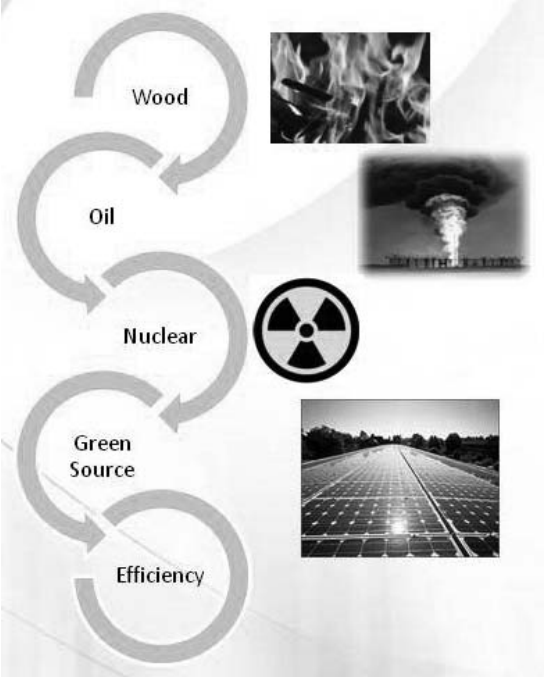
Dr. Abdul Kalam, the Missile Man and a Visionary for Bright Future of India, had clear idea about India's Development and Energy needs and was an advocate of Energy Security and Energy Freedom for India. He said that India should work for Energy Freedom by the year 2030 applying appropriate Technologies and making use of our abundant Renewable Energy Resources. He was advocating the need for Efficient Use of Energy and alternative Fuels through Bio sources.

This Part of the Energy Conservation Series is devoted to studying and understanding some of the basic Ideas propagated by Dr. Abdul Kalam with regard to Energy and Energy Efficiency. The details in brief discussed below are taken from some of his addresses in different forums in the Country.

Dr. Kalam, a strong advocate of nuclear power, said in response to a query on continuing concerns about safety of Kudankulam nuclear power plant that every watt of electricity was important for the country. Generation of electricity by burning the fossil fuel was not environmentally sensible as every one litre fossil fuel used for generating energy produces two kilograms of carbon dioxide. Nuclear plants generates clean energy, he said.

Asked about the safety concerns in the wake of the Fukushima nuclear plant accident in Japan last year, the former President said that there are 546 nuclear reactors currently operating in different countries in the world. He, however, added that the country had to focus on alternative energy sources such as wind and solar energy.

Earlier, during an interactive session, Dr. Kalam said that in India all the nuclear reactors are Uranium-based. India is blessed with thorium as one-third of the total world thorium reserve is in the country, he said. Thorium, however, is not a fissile material, he said adding that the country needed fast breeders to convert thorium into a fissile material.



Energy Independence in India - A Perspective:

India has 17% of the world's population, but only about 0.8% of the world's known oil and natural gas resources. Based on the progress visualized for the nation during the next two decades, the power generating capacity has to increase to 400,000 MW by the year 2030. This takes into consideration of energy economies planned and the design and production of energy efficient equipments and systems. Energy independence has got to be achieved through three different sources namely renewable energy (solar, wind and hydro power), electrical power from nuclear energy and bio-fuel for the transportation sector. Energy independence throws very important technological challenges to the world:

1) The solar cell efficiency has to increase from the present 20% to 55% through intensified research on CNT (Carbon Nano Tube) based solar cells.

2) For thorium reactors, as it is known, thorium is a non-fissile material. It has to be converted into a fissile material using Fast Breeder Technology.
3) In the Bio-fuel area, the challenge is bio-fuel plantation for higher yield, esterification technologies for the higher output and the modification to automobile power plants.

As per Dr. A.P.J. Abdul Kalam, Energy efficiency is the fifth fuel after wood, oil, nuclear and green source. There is awareness in this area of energy efficiency world over as the investment towards improving energy efficiency pays over a short period of time.

Kalam stressed on the scope of 'fifth fuel' that uses energy efficiently. "Various reports suggest that building energy efficiency is perhaps the most economically feasible and convenient way to generate energy by actually saving it. In India, there is a great scope for this fifth source of energy".

Citing an example, Kalam stated that, in distribution of power alone, the losses are over 40% in many states. "There is also an immense scope for energy efficiency at household levels ranging from cooking fuels to smart buildings which can save up to 50% of the energy consumption," he said.

Kalam also spoke on e-waste and said that its generation, handling, transportation and disposal waste were an important concern for the country to address. "Building adequate capacity of modern cost effective disposal systems will need continuous research by recyclers, electronic systems manufacturers and user groups as a whole".

He said that research must be done in areas such as design for environment, for longer life, modularity to enable replacement of specific parts, recycling processes and systems, eco-labeling, dis-assembly, greening supply chains, life cycle assessment and bio-inspired material, among others.

Kalam attached priority on fuel conservation as a sustainable means to achieve energy sufficiency.

Addressing a conference on 'Environment and Its Impact on Society' organized by the JD Birla Institute, Kolkata, Kalam said different reports have suggested that "building energy efficiency is perhaps the most economically feasible and convenient way to generate energy."

Describing "energy conservation" as a "source of fuel" he said: "More than any form of technology, what it needs is the social awareness and incentives for the industries and homes to go green."

Elaborating on the India scenario, he said the losses in power distribution alone are more than 40 per cent in many States. "There is also an immense scope for energy efficiency at household levels ranging from cooking fuels to smart buildings which can save up to 50 per cent of the energy consumption," Kalam pointed out.

He suggested a host of strategies to implement energy conservation. Different industries such as cement, aluminium, steel, fertilizers, and textiles need to "evolve energy utilization norms on per capita basis and provide a challenge to designers to work towards the target."

There is also a need for an "enterprise-wise review within each of these sectors and mechanism to reveal the variance from planned utilization to the actual." Kalam emphasized on the necessity for enterprises to install energy efficient electronic equipment, thereby helping the estimated 75 million rural households deprived of electricity. The aerospace scientist also said consumption of solar energy would be crucial for India's energy future.

He stressed on framing of a national policy on solar power paneled houses.

Meanwhile, Kalam suggested the implementation of Providing Urban Amenities in Rural Areas (PURA) scheme to create more economic opportunities. "First you have to implement the PURA programme for the 700 million people in the villages. The you need to focus on small and medium enterprises throughout the country and value addition for agriculture products which we are not doing," he said when asked about continuous rupee devaluation and slow growth rate.

The concept was mooted by Kalam when he was the President.

"If these three programmers are rolled out nationally, we don't require anybody's help for economic upswing," he added.

(To be continued)

S. Mahadevan, B.E., F.I.E., M.B.A.,
Consultant,
Energy and Energy Efficiency,
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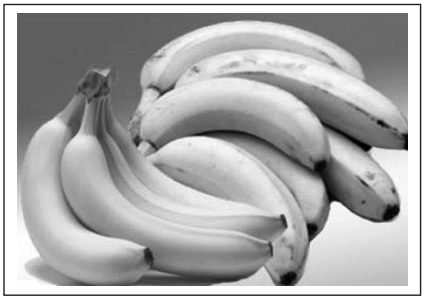
If you fail, never give up because F.A.I.L. means *"First Attempt in Learning"*
End is not the end, in fact E.N.D. means "Effort Never Dies"
If you get No as an answer, Remember N.O. means "Next Opportunity"
So let's be positive – Dr. A.P.J. ABDUL KALAM

FOODS THAT CAN LOWER YOUR HIGH BLOOD PRESSURE

Banana



Scientists from Manipal, India and John Hopkins University have found that eating bananas may reduce blood pressure by 10 percent as it acts like an ACE-inhibitor medication taken for blood pressure. Eat a whole banana as a snack or add it in your morning cereal or make a fruit salad with banana as one of the ingredients. Whatever way you eat it, a medium sized banana will provide 422mg of potassium and 17 percent of the daily recommended value for vitamin C.

Beets

Drinking 500ml of beetroot juice a day can significantly reduce blood pressure, according to scientists. They found that the dietary nitrate in the beet juice was converted to nitrite by the bacteria present on the tongue.

The nitrite is converted to nitric oxide and this is important in the regulation and control of blood pressure

Skinless Poultry

Eating chicken legs or chicken breast or chicken soup may help lower your high blood pressure. A protein found in chicken breast and chicken legs, are broken up in the stomach into peptides (smaller proteins). These peptides had blood pressure lowering activity similar to blood pressure medication - ACE inhibitors. The blood pressure lowering effect continued for at least 4 hours after administration of chicken breast and up to 24 hours in case of chicken legs.

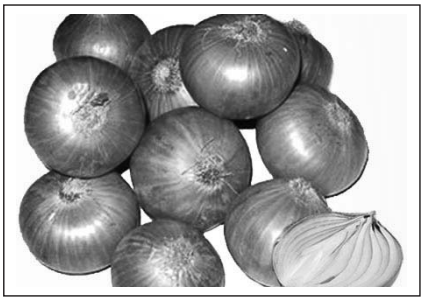
Cocoa

Consuming cocoa in the form of dark chocolate or as a hot drink may reduce blood pressure in overweight people. Chocolate / cocoa is a significant source of polyphenols that is converted to nitric oxide which helps reduce blood pressure. For example, 2 cups of cocoa improves blood vessel function and reduces blood pressure. However, when the drink contains sugar (polyphenols are very bitter by the way!) blood pressure doesn't improve as much. In any case too much of sweetened cocoa isn't a great idea for the waist line. Is it?

Garlic

There are conflicting reports about short term usefulness of garlic in lowering high blood pressure. However it may work over a period of time by cutting down on the blood lipid levels. So, it is actually up to you to use or not to use garlic to reduce high blood pressure. Fresh crushed garlic has the best effect but if you can't stand the pungent smell of garlic, you can use supplements that come in the form of capsules.

Onion



Rutin, a flavonoid, is a non-nutritive dietary anti-oxidant of many foods such as onions, apples, tea and red wine, and has shown health-improving effects in different animal studies. A study indicates that diabetic patients given a supplementation of Rutin tablets for 60 days showed significant reduction in systolic and diastolic blood pressure. Rutin has no side effects.

Potato

This popular but controversial comfort food can actually be very healthy if NOT eaten in the form of greasy fries or chips or even baked and loaded with butter, sour cream or melted cheese. Potato is a very good source of vitamin C and potassium and known for its blood pressure qualities. It also contains blood pressure lowering phenolic amides called kukoamine. Researchers are not sure regarding the quantity of potatoes you will need to eat to lower your blood pressure , but they think that a few good servings of potato (especially with skins) can serve the purpose.

DASH Diet

'Dietary Approaches to Stop Hypertension' diet indicates that higher dietary potassium intake was associated with significantly lower blood pressures. Consumption of a diet including 8.5 servings/day of fruits and vegetables and 4,100 mg/day of potassium lowered blood pressure by an average of 2.8 /1.1 mm Hg (systolic BP/diastolic BP) in people with normal blood pressure and by an average of 7.2 /2.8 mm Hg in people with hypertension. Increasing dietary calcium intake by 800 mg/day in the DASH trial lowered systolic and diastolic blood pressure still further.

Read more: http://www.medindia.net/slideshow/foods-to-lower-your-high-blood-pressure.asp

தேவதை

பிரசவிக்கப் போகும் ஒரு பெண்ணின் பிரசவத்திற்கான ஏற்பாடுகள் நடந்துக் கொண்டிருந்தன உறவினர்கள் எல்லாம் காத்திருக்க அந்த தாய் வலியில் கதறிக் கொண்டிருந்தாள்.

வயிற்றிலிருக்கும் குழந்தைக்கு வழக்கத்திற்கு மாறான சத்தம் ஏதோதோ கேட்டது, நமக்கு என்ன நடக்கப் போகிறதோ என்ற குழப்பம் குழந்தையின் மனதில் ஊசலாடியது, அமைதியாக ஆனந்தமாக மிதந்துக் கொண்டிருந்த நமக்கு என்ன ஆகப்போகிறது, வழக்கமாக நாம் பேசும் கடவுளையே கேட்டு விடலாம் என்று குழந்தை கடவுளை அழைத்தது.

குழந்தை: இறைவனே என்னை எங்கு அனுப்பப் போகிறாய் வழக்கத்துக்கு மாறான ஏதோதோ சத்தம் கேட்கிறது எனக்கு ஒன்றும் புரியவில்லையே.

கடவுள்: குழந்தாய் இனி நீ மனிதர்களுடன் வசிக்கப் போகிறாய்.

குழந்தை: நான் இங்கு சந்தோஷமாகத் தானே இருக்கிறேன் நான் ஏன் அங்கு போக வேண்டும்.

கடவுள்: இல்லை குழந்தாய் நீ இங்கிருப்பது போலவே அங்கும் இருப்பாய் சென்று வா.

குழந்தை: என்னை நீ இங்கு பார்த்துக் கொள்வது போல் யார் என்னை அங்கு பார்த்துக் கொள்வார்.

கடவுள்: கவலைப்படாதே குழந்தாய் அங்கு உன்னை பார்த்துக் கொள்ள ஒரு தேவதையை ஏற்பாடு செய்திருக்கிறேன். அந்த தேவதை உனக்காக பாடும், உன் மீது அன்பு செலுத்தும் அந்த அன்பை நீ உணர்வாய்.

குழந்தை: மனிதர்களிடம் என்னை தனியாக அனுப்புகிறாய் நான் மிகச் சிறியவன் என்னால் நடக்க முடியாது, என்னால் பேச முடியாது, இன்னும் அவர்கள் மொழியைக் கூட புரிந்துக் கொள்ள முடியாது.

கடவுள்: அது மிகவும் சுலபம் உனக்காக நான் ஏற்பாடு செய்திருக்கும் அந்த தேவதை எல்லாவற்றையும் கவனித்துக் கொள்ளும், உனக்கு பேசக் கற்றுக் கொடுக்கும், உனக்கு நடக்க கற்றுக் கொடுக்கும் நீ பயப்படத் தெவையில்லை.

குழந்தை: (அடுத்து என்ன கேட்பது என்று தெரியாமல் கடவுளையே பார்த்தது) ம்ம்ம்.... நான் உன்னோடு பேச வேண்டும் என்றால் என்ன செய்வேன்.

கடவுள்: (மென்மையாக சிரித்து) நான் ஏற்பாடு செய்திருக்கும் அந்த தேவதை இதையும் உனக்கு சொல்லிக் கொடுக்கும்.

குழந்தை: உலகில் கெட்ட மனிதர்கள் இருப்பார்கள் என்று இங்குள்ள தேவதைகள் பேசிக் கொள்கிறார்களே அவர்களிடமிருந்து என்னை யார் காப்பற்றுவார்.

கடவுள்: (வாஞ்சையுடன் குழந்தையை தடவி), உனக்கு நான் ஏற்பாடு செய்திருக்கும் அந்த தேவதை தன்னுயிர் போனாலும் உன்னை பாதுகாக்கும்.

குழந்தை: (மிகவும் சோகமான முகத்துடன்) இனி நான் உன்னை பார்க்கவோ, பேசவோ முடியாதா?

கடவுள்: (குழந்தையை அன்பாக அணைத்து) உனக்காக நான் ஏற்பாடு செய்திருக்கும் அந்த தேவதையிடம் நீ போனதுமே என் பெயர் உனக்கு சொல்லும், சதா என்னைப் பற்றி உன்னிடம் பேசும், என்னிடம் திருப்பி வரும் வழியையும் உனக்கு சொல்லித் தரும், நான் உன்னோடு தான் இருப்பேன் ஆனால் நீ என்னைப் பார்க்க மாட்டாய். உலகின் சத்தங்கள் அதிகமாக குழந்தைக்கு கேட்க தொடங்கின

குழந்தை: (மிகவும் கடவுளைப் பிரியும் சோகத்துடன்) இறைவனே இன்னும் கொஞ்ச நேரத்தில் உன்னை விட்டுபிரியப் போகிறேன் நீ எனக்காக ஏற்பாடு செய்திருக்கும் அந்த தேவதையின் பெயரையாவது சொல்

கடவுள்: குழந்தாய் தைரியமாக சென்று வா உனக்காக நான் ஏற்பாடு செய்திருக்கும் அந்த தேவதையின் பெயர் முக்கியமில்லை. அவளை நீ அம்மா என்று அழைப்பாய். கடைசியாக உனக்கு ஒரு அறிவுரை நீ வளர்ந்து பெரியவனானதும் அந்த தேவதையின் மனம் புண்படும் படி எதுவும் பேசி விடாதே.

குழந்தை வீறிட்டு அழுதபடி உலகில் பிறந்தது.

வந்து பாருங்கள் – ரஞ்சன்குடி கோட்டை

முகமது அலியும் சந்தா சாகிப்பும் மோதிய இடம்

பள்ளி செல்லும் பிள்ளைகள், பாடப் புத்தகங்களைத் தாண்டி வரலாற்றுச் சுவடுகளை தரிசிக்க, மிச்சமிருக்கும் தமிழகத்தின் சிதிலங்களில் ஒன்று ரஞ்சன்குடி கோட்டை. பெரம்பலூரிலிருந்து சென்னை விரையும் தேசிய நெடுஞ்சாலையில் 16வது கி.மீ.–ல் மங்கலமேடு நிறுத்தத்தில் இருந்து உள்ளடங்கி இருக்கிறது ரஞ்சன்குடி கோட்டை.

ஆங்கிலேயர் உதவியுடன் முகமது அலியும், ப்ரெஞ்சுப் படை உதவியுடன் சந்தா சாகிப்பும் மோதிக்கொண்ட வால்கொண்டா போரில், இந்தக் கோட்டை முக்கியப் பங்காற்றி இருக்கிறது. போரின் பெயரில் உள்ள வாலிகண்டபுரம் ஊர் அருகில் உள்ளது.

பிரம்மாண்டத் தோற்றம், கோட்டையைச் சுற்றி ஒரு காலத்தில் முதலைகள் வலம் வந்த அகழி, கோட்டைக்குள் மாளிகை குடியிருப்பு வழிபாட்டுப் பகுதிகள், கொடி மேடை, கண்காணிப்புக் கோபுரங்கள், பீரங்கி மேடைகள், ஆயுதக் கிடங்குகள், எதிரிகளையும் துரோகிகளையும் சாகும் வரை சிறை வைத்ததாகச் சொல்லப்படும் மரணக் கிணறு, புதிர்களைப் புதைத்து வைத்திருக்கும் தூர்ந்த சுரங்க பாதையின் எச்சங்கள், ஒரே கல்லில் குடைந்து உருவான சூரிய மற்றும் சந்திர குளங்கள்... இப்படிக் கால இயந்திரத்தில் ஏறி, வரலாற்றுப் பின்னணியில் ஒரு நாளைச் செலவழிக்க விருப்ப முள்ளவர்கள் ரஞ்சன்குடி கோட்டைக்கு குடும்பத்தோடு வந்து செல்லலாம்.

நுழைவு வாயில் கோட்டைக்கான படிகள், கோட்டை மேலே பாதுகாப்புக்கான சுற்றுக் கைப்பிடி எனக் கடந்த சில மாதங்களாக தொல்லியல் துறை மேற்கொண்ட புனரமைக்கும் பணிகளில் ரஞ்சன்குடி கோட்டை, குழந்தைகள் மற்றும் வயதானவர்களும் சுற்றிப் பார்க்கத் தோதாகப் புதுப் பொலிவு பெற்றிருக்கிறது.

Courtesy: தி இந்து, ஜய வருட மலர் 2014

20 MOST PEACEFUL COUNTRIES IN THE WORLD - 9

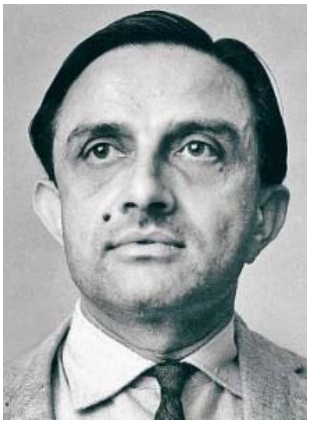
SWITZERLAND

According to IEP, the Swiss maintain a well-functioning government and an open political culture. Illustrating the quality of government, **Switzerland** received the lowest score for political instability. It's also among the world's most peaceful countries that have low levels of violent crime. Although Switzerland is known for its neutrality in regional, international and global political issues, it maintains strong diplomatic relations with various countries around the world.

(To be continued)

Courtesy: Amerikanki

VIKRAM AMBALAL SARABHAI (1919 – 1971)



Vikram Ambalal Sarabhai (12 August 1919 – 30 December 1971) was an Indian physicist. He is considered the father of India's space programme.

Biography

Vikram Ambalal Sarabhai was born on 12 August 1919 in the city of Ahmedabad, in Gujarat state in western India. The Sarabhai family was an important and rich Jain business family. His father Ambalal Sarabhai was an affluent industrialist, owned many textiles mills in Gujarat, and devoted his life to poor people.

Vikram Sarabhai went to Sheth Chimanlal Nagindas Vidyalaya for his high school studies. Vikram Sarabhai matriculated from the Gujarat College in Ahmedabad after passing the Intermediate Science examination.

After that, he moved to England and joined the St. John's College, University of Cambridge. He received the Tripos in Natural Sciences from Cambridge in 1940.

Marriage and children

In September, 1942, Vikram Sarabhai married Mrinalini Sarabhai, a celebrated classical dancer. The wedding was held in Chennai without anyone from Vikram's side of the family attending the wedding ceremony because of the ongoing Quit India movement led by Mahatma Gandhi. Vikram and Mrinalini had two children - Kartikeya and Mallika. Vikram Sarabhai had a troubled marriage as a result of his long affair with Kamala Choudhary.

His daughter Mallika Sarabhai was awarded the Padma Bhushan, India's third highest civilian honour for the year 2010 and his son Kartikeya Sarabhai was awarded the Padma Shri in 2012.

Physical Research Laboratory

Sarabhai returned to an independent India in 1947. Looking at the needs of the country, he persuaded charitable trusts controlled by his family and friends to endow a research institution near his home in Ahmedabad. This led to the creation of the Physical Research Laboratory in Ahmedabad on November 11, 1947.

Death

Sarabhai died on 31 December 1971 at Halcyon Castle, Kovalam, Kerala because of heart attack due to excessive stress. He was visiting Thiruvananthapuram to attend the foundation stone laying ceremony of the Thumba railway station being built to service the newly created Thumba Equatorial Rocket Launching Station.

Indian space programme

The establishment of the Indian Space Research Organization (ISRO) was one of his greatest achievements. He successfully convinced the government of the importance of a space programme for a developing country like India after the Russian Sputnik launch. Sarabhai emphasized the importance of a space programme in his quote:

> "There are some who question the relevance of space activities in a developing nation. To us, there is no ambiguity of purpose. We do not have the fantasy of competing with the economically advanced nations in the exploration of the moon or the planets or manned space-flight."
>
> "But we are convinced that if we are to play a meaningful role nationally, and in the community of nations, we must be second to none in the application of advanced technologies to the real problems of man and society."

Homi Jehangir Bhabha, widely regarded as the father of India's nuclear science program, supported Sarabhai in setting up the first rocket launching station in India. This center was established at Thumba near Thiruvananthapuram on the coast of the Arabian Sea, primarily because of its proximity to the equator. After a remarkable effort in setting up the infrastructure, personnel, communication links, and launch pads, the inaugural flight was launched on November 21, 1963 with a sodium vapour payload.

As a result of Sarabhai's dialogue with NASA in 1966, the Satellite Instructional Television Experiment (SITE) was launched during July 1975 – July 1976 (when Sarabhai was no more). Sarabhai started a project for the fabrication and launch of an Indian satellite. As a result, the first Indian satellite, Aryabhata, was put in orbit in 1975 from a Russian Cosmodrome.

Sarabhai was very interested in science education and founded a Community Science Centre at Ahmedabad in 1966. Today, the centre is called the Vikram A Sarabhai Community Science Centre.

He led the Sarabhai family's diverse business conglomerate. His interests varied from science to sports to statistics. He set up Operations Research Group (ORG), the first market research organization in the country.

This was my first stage, in which I learnt leadership from three great teachers—
Dr Vikram Sarabhai , Prof Satish Dhawan and Dr Brahm Prakash.
This was the time of learning and acquisition of knowledge for me.

Dr. A.P.J. ABDUL KALAM

Sarabhai established many institutes which are of international repute. Most notable among them are the Nehru Foundation for Development in Ahmedabad, Indian Institute of Management Ahmedabad (IIMA), which is considered a world class management institute. Also, he helped establish the Physical Research Laboratory (PRL), which is doing a commendable job in R&D in physics. Sarabhai set up Ahmedabad Textiles Industrial Research Association (ATIRA), which helped the booming textiles business in Ahmedabad. He also set up the Center for Environmental Planning and Technology (CEPT). Not stopping with all these, he went ahead and set up the Blind Men Association (BMA) which helps visually-challenged people with the necessary skills and support. Along with his wife Mrinalini Sarabhai, he founded the Darpana Academy of Performing Arts. Other well-known institutions established by him include the Faster Breeder Test Reactor (FBTR) in Kalpakkam, Variable Energy Cyclotron Project in Calcutta, Electronics Corporation of India Limited (ECIL) in Hyderabad and Uranium Corporation of India Limited (UCIL) in Jaduguda, Jharkhand.

Awards

- Shanti Swarup Bhatnagar Award (1962)
- Padma Bhushan (1966)
- Padma Vibhushan, posthumous (1972)

Distinguished Positions

President of the Physics section, Indian Science Congress (1962)

President of the General Conference of the **I.A.E.A**., Verína (1970)

Vice-President, Fourth U.N. Conference on 'Peaceful uses of Atomic Energy' (1971)

Vikram Sarabhai Space Centre, (VSSC), which is the Indian Space Research Organization's lead facility for launch vehicle development located in Thiruvananthapuram (Trivandrum), capital of Kerala state, is named in his memory.

Along with other Ahmedabad-based industrialists, he played a major role in setting up of the Indian Institute of Management, Ahmedabad.

In 1973, the International Astronomical Union decided that a lunar crater Bessel A in the Sea of Serenity will be known as the Sarabhai crater.

HUMOUR

The IAS Interview

One young man went for an IAS Interview.

"When did India get independence?" He was asked.

"The efforts began a few years earlier and final result was in 1947" He replied.

"Who was responsible for our independence?"

"There were so many. Whom to mention? If I name one, it will be a injustice to another." He replied.

"Is corruption the number one enemy in our country?"

"Some research is going on the subject and I can answer with certainly only after seeing the report" He replied.

The interview board was very pleased with his original and thoughtful answers and asked him not to reveal the questions to others, since they were planning to ask the same questions.

When he went out naturally others were curious to know what was asked. He politely declined, but one persistent friend Mr. X, would not leave him. "At least tell me the answers" he pleaded, and our friend obliged.

Then it was the turn of this Mr. X. When he went inside, since his resume was slightly illegible, the board member asked him." By the way, what is your date of birth?"

He replied, "The effort began a few years earlier and final result was in 1947."

Somewhat puzzled, they asked another clarification. "What is your fathers name?"

He replied, "There were so many. Whom to mention". If I name one, it will be injustice to another".

The interviewer was incensed. "Hey! Are you mad or what?"

He replied. "Some research is going on the subject. I can answer with certainty only after seeing the report."

Marvellous answer

A mechanic was removing the cylinder heads from the motor of a car when he spotted the famous heart surgeon in his shop, who was standing off to the side, waiting for the service manager to come to take a look at his car.

The mechanic shouted across the garage, "Hello Doctor!! Please come over here for a minute."

The famous surgeon, a bit surprised, walked over to the mechanic.

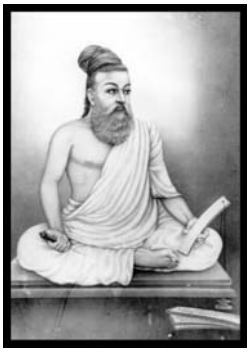
The mechanic straightened up, wiped his hands on a rag and asked argumentatively, "So doctor, look at this. I also open hearts, take valves out, grind 'em, put in new parts, and when I finish this will work as a new one. So how come you get the big money, when you and me is doing basically the same work? "

The doctor leaned over and whispered to the mechanic.....

He said: **"Try to do it when the engine is running."**

If you salute your duty, you no need to salute. Anybody, but if you pollute your duty, you have to salute everybody ***– Dr. A.P.J. ABDUL KALAM***

TIRUKKURAL AND MANAGEMENT IN A 'NUTSHELL' – 28



Tiruvalluvar very aptly deals with Greatness and Pride in Leaders and this looks so relevant as we come across lot of leaders today with so much of greed and no concern for achieving greatness of any sort.

Perumai Udaiyavar Aatruvaar Aatrin
Arumai Udaiya Seyal ***Kural 975***

பெருமை உடையவர் ஆற்றுவார் ஆற்றின்
அருமை உடைய செயல் குறள் 975

"Those that are great have the puissance to employ adequate means and achieve things that are impossible for others"

Orumai Magalire Polap Perumaiyum
Thannaiththan Kondozhugin Undu ***Kural 974***

ஒருமை மகளிரே போலப் பெருமையும்
தன்னைத்தான் கொண்டுஒழுகின் உண்டு. குறள் 974

"Even as Chastity in a woman, greatness can be maintained only by being true to oneself"

Paniyumam Endrum Perumai; Sirumai
Aniyumam Thannai Viyandu ***Kural 978***

பணியுமாம் என்றும் பெருமை: சிறுமை
அணியுமாம் தன்னை வியந்து குறள் 978

"Greatness is ever unpretending and modest; but littleness vaunteth its merits before all the world"

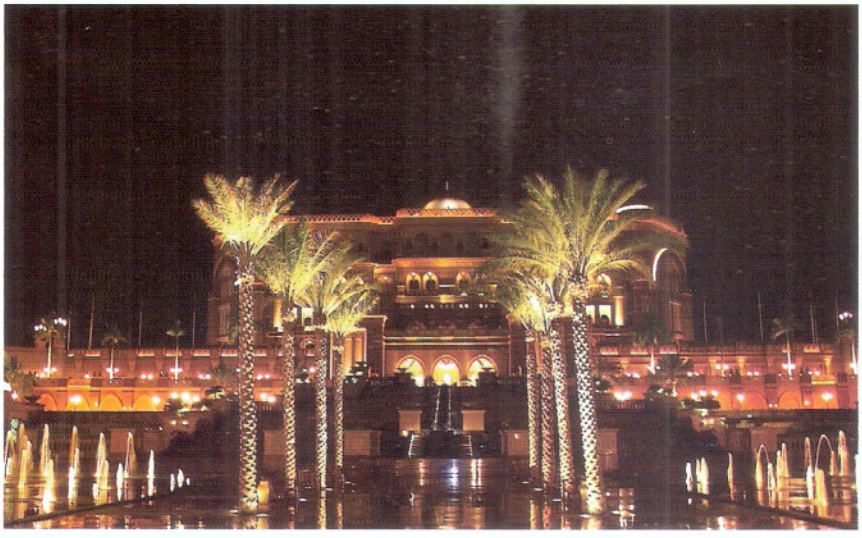
HOME FESTIVALS – 9

புரட்டாசி – Purattasi (September/October)

Navaratri ("nine nights") is the principal festival this month (above left). The Goddess is worshipped in Her many forms, and on the ninth day, Sarasvati (center of the painting) is invoked to bless musical instruments, account books, agricultural instruments and home tools(upper left). On Vijaya Dasami, the day following Navratri, Goddess Durga is invoked as children are given their first instruction, worship their school books and honor their teacher (bottom left). A decorated display of dolls (lower right) is displayed through the nine days, then dismantled and stored on the tenth day. Vijaya Dasami is also the birthday of Lord Venkateshwara (upper right), presiding Deity of Tirupati temple in Andhra Pradesh, India's wealthiest temple. *(To be continued)*

The scientific thought of the present day progressively approximates to and supports the conclusion of Sri Sankara in the repudiations of the world of difference. This modern view will prepare the way for inculcating a sense of peace in the world. With the obliteration, through proper insight, of the sense of difference among the citizens of the world, among leaders of men and among administrators, the wise, the brave and the thoughtful men will no longer feel that others are different from themselves. They will realize their oneness even with the men of enemy countries. Themselves afflicted by the afflictions of the people of those lands, they will prove to be the foundation for raising the edifice of world peace. – *H.H. SHRI PARAMACHARYA*

EMIRATES PALACE IN ABU DHABI



Emirates Palace is Abu Dhabi's iconic landmark showcasing Arabian culture and hospitality at its finest Built as an iconic landmark showcasing Arabian culture and hospitality at its finest, Emirates Palace, managed by Kempinski, has created an enviable niche in luxury hospitality, welcoming world leaders, celebrities, global business travellers and leisure guests with a truly memorable and unique experience, luxurious contemporary facilities and amenities in comfortable and traditional Arabian surroundings with personalized world class service. Situated on a 1.3 km stretch of private white pristine beach and on 100 hectares of manicured lawns and lush landscaped gardens, Emirates Palace comprises 394 luxury rooms and suites and a variety of award winning dining options. The resort's leisure facilities include two intricately landscaped swimming pools one to refresh and relax and one perfectly designed for adventure and family fun, an Anantara spa, tennis courts, and a state of the art fitness centre.

Emirates Palace houses the most luxurious and technologically advanced meeting facilities in the region which include an auditorium with up to 1,100 seats, the ballroom for up to 2400 guests, over 40 meeting rooms, a Media Centre and a Business Centre and outdoor venue capacity for up to 20,000 guests. As a world-class leader in the Meetings, Incentive, Conference and Events market, Emirates Palace plays host to a spectacular cultural calendar including host for the Middle East International Film Festival, the largest Hotel Art Gallery with regular exhibitions, popular and classical music concert programme. With a FIFA standard football pitch and home to Manchester City's winter training ground, Emirates Palace offers the best in world sports action including the annual Lashings Cricket Festival.

Printed and Published by 'Tamilnadu Electrical Installation Engineers' Association
"A" Grade, Chennai -14. Editor : G. Venkatesh Advisor : S. Mahadevan