ELECTRICAL INSTALLATION ENGINEER

NEWS LETTER

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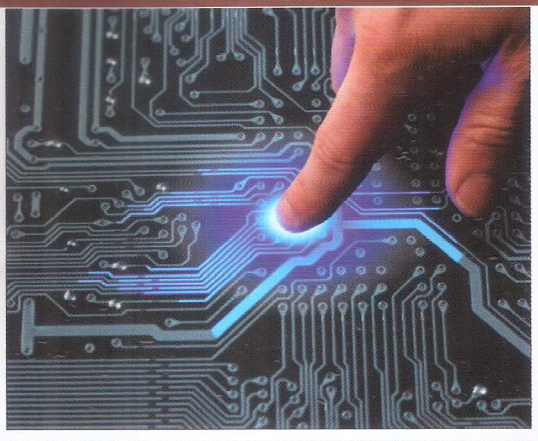
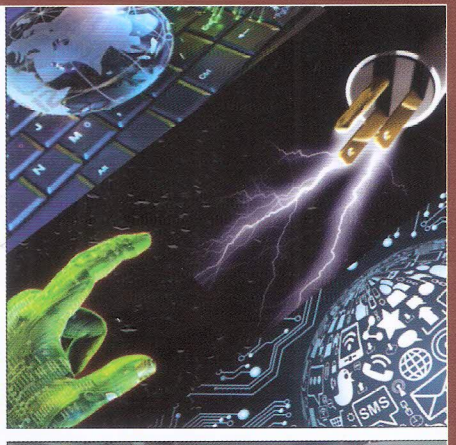

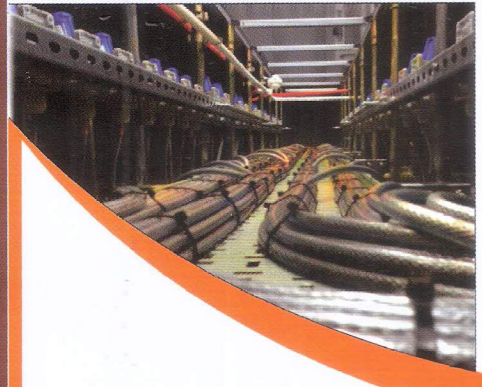
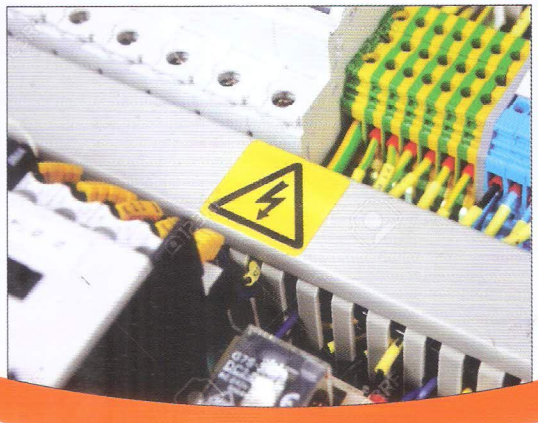


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STALL BOOKINGS OPEN

THANKS GIVING BY THE MEMBERS, TO THE HONOURABLE MINISTER, CEIG AND SEI FOR NOMINATING OUR ASSOCIATION PRESIDENT AS A MEMBER OF LICENSING BOARD

Mr. U. BASKARAN, *President honouring Honorable Minister* **Thiru P. THANGAMANI**, *Electricity, Non-Conventional Energy Development, Prohibition and Excise, Molasses and Prevention of Corruption Act*

Mr. K. KANNAN, *Secretary honouring Honorable Minister* **Thiru P. THANGAMANI**, *Electricity, Non-Conventional Energy Development, Prohibition and Excise, Molasses and Prevention of Corruption Act*

Mr. U. BASKARAN, *President honouring* **Mr. V. JAYAVEL,** ***CEIG*** **& Mr. K. KANNAN,** *Secretary honouring* **Mr. P. MANOHAR,** *SEI*

Mr. P. SUYAMBU, Treasurer *honouring* **Mr. V. JAYAVEL,** *CEIG* **& Mr. B. PAALANIKUMAR,** Vice President, Chennai *honouring* **Mr. P. MANOHAR,** *SEI*

TNEIEA Members with CEIG & SEI

EDITORIAL

Dear Members, Fellow Professionals, Friends and Well wishers,

SEASONS GREETINGS TO ONE AND ALL!

HAPPY INDEPENDENCE DAY!!

LET US WISH AND CELEBRATE "HAPPY BIRTH DAY CHENNAI"!!!

August can certainly be considered as one of the important months in our calendar. Part of the month is meant for Prayers to Goddesses and most of the month goes in lots of noise and lots of Advertisements, Discounts and Sales and Sales and is associated with lot of Festivals and Poojas. Most importantly, this month also brings in **celebrations of Independence Day** and **Chennai's Birth Day** and **remembrances of the day of "Quit India" Movement.**

Quit India Movement really gave the 'Big Push' for the Freedom Movement and the Freedom of the Country was finally got on 15th August 1947. India's March of Self Governance and Governance for all round betterment and Growth started with unimaginable quantum of problems of all kinds, the chief of them being Poverty and Backwardness. But the courageous and patriotic leaders of those times headed by leaders like Nehru and Patel and ever so many of them, marched forward boldly to take the Country forward. The Progress and Growth were slow but steady in spite of all odds and the credit should be given first to the People of this Country, who withstood all hardships, used all opportunities, helped retain the Democratic Fabric of this Country without being torn and ultimately made the Country GROW. There have been Good Measures of Plans and Programs by many responsible Governments over the decades, but it is ultimately the People who helped Growth of Wealth through Agriculture, Industries and Services. We have attained a situation of Self Sufficiency in Food (achieved almost 3 decades ago) with exportable surplus and substantial Growth in all areas, be it Transport or Roads or Telecommunication or Electricity. **In the area of Electricity, India will have a deficit free year in FY 2017 for the first time in its History.** This may sound unbelievable but it is true as reported by Economic Times. We have published more details on this separately in this News Letter.

In both of the areas of Food and Electricity, the potential in our Country is huge and positive moves are on with bright periods ahead. One area of concern could be International Trade Deficit, which is caused by the huge but unavoidable import of Petroleum Crude. This can be addressed steadily and successfully through serious adoption of Bio Diesel and Bio Crude Technologies and policies, as we seem to have identified and assured potentials for these in our country.

It is also true that the patriotic Citizens of this Country are all very disturbed to see all round chaos in societies all over the Country dominated by growing 'Greed' and 'Materialism' of people exploited by opportunistic Politics and Leaders, who have divided people with castes, religions and languages and corrupted the whole society. After ¾ of a Century, it will be appropriate to re launch a 'Quit India' Movement with a Mission to make all these bad things to go out of India. It is surprising and also an agony to see that India is able to produce so much of Wealth that there is enough for bad people to loot and take it out of the Country as illegal money.

This is also a month when "Chennai Day/ week" is celebrated coinciding with the Foundation Day of the City commencing from the British time in 1639. The City has a Great Heritage and History and is also one of the earliest cities to get Electricity around the same time with Calcutta and Bangalore. **Just for the interest of the readers, History Time Line of Chennai city is published in this News Letter.**

We thank all those members who have helped us by participating in the advertisement appearing for the issue July 2016 – Sun sine Solution Pvt. Ltd., Electrician 2016, Universal Earthing Systems Pvt. Ltd., Electrotherm (India) Ltd, Supreme Power Equipment Pvt. Ltd., Dehn India Pvt. Ltd., Anchor Electricals Pvt. Ltd., Abirami Electricals, Ashlok Safe Earthing Electrode Ltd., The Motwane Mfg. Co. Pvt. Ltd., OBO Bettermann India Pvt. Ltd., Wilson Power and Distribution Technologies Pvt. Ltd., Galaxy Earthing Electrodes (P) Ltd., Elektrotec 2016 EDITOR

ELECTRICAL INSTALLATION ENGINEER

President : U. BASKARAN
Secretary : K. KANNAN
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MEMBERS DETAILS

S.No.	Company Name	District	Contact No.	License No.
106.	Swan Electric Contracts Co P Ltd.	Chennai	044-28330151, 98840 25888	ESA 282
107.	Symtec	Chennai	044-22253110, 92821 69383	EA 1406
108.	Tandem Enterprises	Chennai	044-24838033, 94443 88361	ESA 132
109.	Techno Engineering	Chennai	044-24810544, 98400 48985	EA 2064
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111.	Transpower Engineering Services	Chennai	044-24320536, 72999 82374	EA 2421
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114.	Vennila Electricals	Chennai	044-42024607, 98410 86269	EA 1680
115.	Vinoth Electricals	Chennai	044-28275161, 98407 09505	EA 2577
116.	Volt Amps Consultancy	Chennai	98846 21378	EA 2872
117.	VPS Enterprises	Chennai	044-26793869, 95000 79065	EA 2320
118.	Deena Enterprises	Chennai	044-26711142, 94455 60235	EA 2818
119.	Goms Electricals Pvt. Ltd	Chennai	044-24611648, 94457 50016	ESA 231
120.	Magna Enterprises	Chennai	044-42032732, 98409 51381	EA 1646

CHENNAI TIME LINE

1996 - City of Madras renamed as Chennai

1969 - First World Tamil Congress held

1947 - Madras chosen as capital of the Madras State

1943 - Japanese fighter plane drops bombs on the city

1931 - Suburban electric train services begin

1925 - Bus transport begins

1917 - First aeroplane flies

1889 - High Court built

1876 -78 - Great Famine of Madras

1862 - Construction of harbour begins

1842 - First lighthouse built

1831 - First commercial bank founded; first census take

1792 - Systematic meteorological observations begin

1785 - First post office starts functioning

1767 - Hyder Ali's first invasion

1749 - Treaty of Aix-la-Chappelle

1746 - French captures the city

1708 - Wall built around the Black Town

1701 - Aurangazeb's general Daud Khan attacks Fort

1688 - Madras City Municipal Corporation inaugurated

1668 - First expansion of the city

1639 - British arrive and establish the city of Madras

1612 - Dutch arrive and establish near Pulicat

1522 - Portuguese arrive and build the Sāo Tomē port

EVENTS

L&T Training Programme

Design of Control Circuits	1st – 2nd September 2016
Switchboard Electrical Design	7th – 9th September 2016
Best Maintenance Practices in LV Switchgear	19th – 23rd September 2016
Introduction to Industrial Electrical Systems	12th – 14th & 14th – 16th September 2016
Switchgear Selection – Motor Control Centre (MCC)	26th – 27th September 2016
Switchgear Selection – Power Control Centre (PCC)	28th – 29th September 2016

Venue: L & T Ltd., Switchgear Training Centre, Nilgiris
Contact Tel.: 0423-2517107 **Fax:** 0423-2517158
Email: stc_coonoor@lntebg.com

Events Profile: Expo intends to accelerate the growth of India's Renewable Energy sector and contribute to the country's sustainable economic development. The show aims to upscale and mainstream the applications of renewable energy resources, showcase innovations, and enrich deliberations by providing the industry with an international exhibition and conference platform.
Date: 7th – 9th September 2016
Venue: India Expo Centre, Greater Noida, India
Website: http://www.renewableenergyindiaexpo.com/

Events Profile: Elektrotec 2016 is one of the largest electrical and industrial electronics sector trade events in India.
Date: 15th – 18th September 2016
Timings - 10.30 AM to 06.00 PM
Venue: CODISSIA TRADE FAIR COMPLEX, Avinashi Road, Coimbatore
Website: http://elektrotec.codissia.com/

ELECTRICIAN 2016 Trade Fair
Events Profile: Tamilnadu Electricians Welfare Association is working for the welfare & development of Electrical Workers working in the Non-formal Sector, with more than 20,000 members in 10 districts of Tamilnadu. The trade fair is open both to professional People and Public. The Visitor's Profile includes Members of our Association, Students from Engineering Colleges, Polytechnics and Industrial Training Institutes in Chennai City, Electrical Contractors in Chennai, Builders and Electrical Engineers in Chennai.
Date: 17th & 18th September 2016 **Venue:** Valluvar Kottam, Nungambakkam, Chennai
Website: http://www.tnewa.org/

KNOW THY POWER NETWORK - 107

Let us restart our journey. We are coming to the end of this topic viz. Happiness Index of Electrical Equipment. It can be considered as the closure of various snaps / views taken from the view point of "Equipment comfort level". Next month, let us move to a new location / topic from where we can have some more views of the power system.

While considering various parameters of the equipment and its surrounding environment for arriving at the Happiness Index of the equipment, we have to keep several determining factors in our view. Among them significant are, physical or visual inspection of the equipment and its surrounding operating environment, the results of various signature tests conducted on it and the permissible directions, allowable / permissible levels as fixed by company and international standards and codes and the operating problems / distress signals, if any emanated from the equipment concerned.

There is a distinction between the Happiness Index of individual equipment and the plant as a whole. The Happiness Index of the plant as a whole is obtained by adding the marks or scores obtained by major, individual machinery / equipment in the plant.

A model format for the assessment of Happiness Index of an equipment is appended below. If need arises, it can be improved upon since it is given as a guide only.

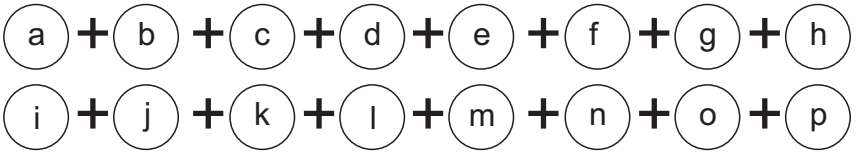
While calculating Happiness Index of any equipment, the rating / marks in a scale from "1 to 10" may be assigned / given for each parameter like test result operating conditions and surrounding atmosphere and finally all these ratings should be added up to get a conclusive figure. *To get clarity, it is requested that the readers may kindly refer to page 10-11 of March 2016 of our Newsletter. It is a simple procedure to be followed.*

Please read the Table in page nos. 10, 11 and then read the following matter

After fixing the ratings for the equipment condition as per the above list, the final tally has to be arrived at. This will give the present Happiness Index of the equipment. This index is a variable one; it varies from time to time. Hence it has to be determined regularly to find out the happiness or comfort level of the equipment upon adding the marks obtained by each parameter. The final figure obtained will give the Happiness Index of the equipment concerned or in our focus.

Final tally Happiness Index or rating of the equipment

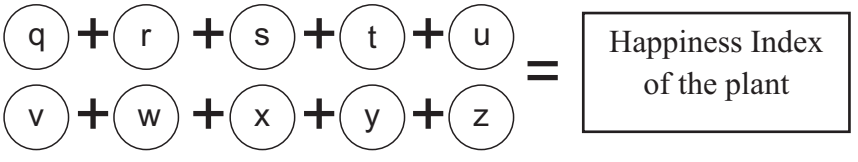
(Parameter – marks rating)
Plot 16 circle in which the ratings given are to be recorded



(Add all these Marks)

When a number of equipment exist in a plant add the Happiness rating of equipment and the final tally will give the Happiness Index of the plant as a whole.

Plot 10 circles in which the final ratings as obtained by the individual equipment are recorded



"EQUIPMENT HAPPINESS INDEX ASSESSMENT SHEET"

S.No.	Description	(Marks to be assigned / given)				
		Poor	Fair	Satisfactory	Good	V. Good
		2	4	6	8	10
		I	II	III	IV	V
	A. EXTERNAL					
1.	Adequacy of selection and installation - it covers poor manufacturing design handling, erection and commissioning					
2.	Operating History ⟶ (failures faced, faults experienced and repairs)					
3.	Enclosing or operating environment. (Adequacy of cooling arrangements + presence of dust, dirt, oil, water, moisture ingress, contaminants corrosive fumes. Hot spots, poor ventilation and foundation conditions)					
4.	Visual inspection of the external parts of the equipment / structure					
5.	Quality of inputs (quality of input power, present conditions of an receiver / filter in the case of compressor)					
6.	Presence of external threats (it covers arcs and sparks - both external and internal, presence of harmonics, fire, chemical attacks, exposure to lightning, static discharges including that caused by forced oil discharges and ferro resonance and normal resonance, over fluxing in case of transformers and self excitation in case of motors and transformers)					
7.	Severity of duty or loading condition (it encircles frequent switching on and off and severity of loads addition and removal – loading pattern). Presence of composite circuits in case of Circuit Breakers in transmission & dist networks.					
8.	Condition of equipment parts / components like bearings, brushes, belts and the condition of connected drives.					
	B. INTERNAL					
9.	Inherent defects and Internal condition of key components of the equipment like windings, winding insulation, core stamping and its cooling medium (air, hydrogen, oil and water). Various signature, diagnostic and condition monitoring tests will reveal these internal conditions					
	a) Transformer - some useful tests (winding shorts, winding movements) - Open circuit and short circuit tests - Sweep frequency tests - DGs tests on its oil - Megger tests					

S.No.	Description	(Marks to be assigned / given)				
		Poor	Fair	Satisfactory	Good	V. Good
		2	4	6	8	10
		I	II	III	IV	V
	- Oil and winding temperature - Percentage impedence determination					
	b) Rotating Machines - HV Megger tests (Polarization test) - Vibration analysis - Condition of lubricating oil - Infra red thermographic tests					
	c) Large Generator - Condition of its cooling medium - Condition of its bearings lubrication and its bearing gear thing					
	d) Circuit Breakers - Contact Resistance - Changes in the vibrations faced by it and its foundation as well - Contacts travel - Simultanity of contacts closing and opening, oil/SF_6 gas leaks, moisture ingress in oil/SF_6 gas mediums					
10.	Thermal and electrical with stand levels of the equipment insulation (check whether the present levels are with in / beyond or below the permissible levels)					
11.	Condition of insulating medium (oil/SF_6 gas) as revealed by diagnostic tests. Levels or condition of the insulating medium as revealed by screening tests like moisture ingress, BDV value, SF_6 gas density and pressure					
12.	**Status and adequacy of protection** (over voltage, short circuits, earth faults, Human beings / animals fire protection) (note down the presence of inadequacies, weak spots, missing links in the protective chain of the equipment / its location station / plant concerned					
13.	Adequacy of maintenance (Adherence to the maintanance schedules as stipulated by the departmental standards / codes)					
14.	Adherence to the standard operating procedures as given by the manufacturer of the equipment					
15.	Presence of various ageing factors and its impact on the life span of equipment (presence of thermal, mechanical, electrical, physical and environmental/ageing as revealed by various tests and residual life determination)					
16.	Condition of equipment monitoring devices. (Their present level and checks on their working condition)					

For 10 equipment in the plant

Reduce this Happiness Index to the base of 100 or arrive in percentage.

One equipment max. Mark = 160

Ten equipment =160x10 = 1600

Worked example

Based on our parameter study, rating is given / one equipment as shown below

$$\begin{matrix} 4+2+6+8+4+4+2+4 \\ 4+2+4+6+8+4+6+4 \end{matrix} = \boxed{72}$$

In similar way the ratings obtained by other equipment in the plant are recorded as shown below

$$\begin{matrix} 72+80+88+90+96 \\ 54+130+110+120+120 \end{matrix} = \boxed{960}$$

On adding all these marks we get the final tally of 960.

Happiness Index of a plant equipment with

10 equipment = 960

Maximum level = 16x10x10 = 1600

Percentage of HI = Happiness level $= \frac{960}{1600} \times 100$

$= 60\%$

$= 60$ Percent

Therefore Happiness Index of the industry in point is 60 percent (Sixty Percent).

To get a clear picture of the industry / equipment status, the calibrated scale given below is useful.

S.No	Ratings / Marks obtained during Happiness Index check up	Remarks
1.	30 and less →	Very low Happiness / comfort level; equipment may die or pass-out in the near future
2.	31 - 60 →	Moderately good performance; equipment happiness level is good
3.	61 - 90 →	Good performance (very happy level)
4.	100 →	Extremely happy or very high performance level

I sincerely feel that I have successfully handled this complex topic viz. Happiness Index for in service electrical equipment to the greater satisfaction of the readers. Am I correct?

With this, I would like to conclude.

Good bye. Stay tuned till then.

(To be continued...)

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Mobile: 98402 07703

சுருக்கம்

மின் உரிமம் வழங்கும் வாரியம் – தமிழ்நாடு எலக்ட்ரிகல் இன்ஸ்டலேஷன் என்ஜினியர்ஸ் அசோசியேஷன் (ஏ கிரேடு) சார்பாக அதன் தலைவர் திரு.உ.பாஸ்கரன் அவர்களை மின் உரிமம் வழங்கும் வாரியத்தில் உறுப்பினராக நியமனம் செய்து –ஆணை வெளியிடப்படுகிறது.

எரிசக்தி(டி2) த்துறை

அரசாணை (வாலாயம்) எண்.158 நாள் 13.07.2016

திருவள்ளுவர் ஆண்டு 2047,
துன்முகி வருடம், ஆனி 29.

படிக்கப்பட்டது

1) அரசாணை (வாலாயம்) எண்.66, எரிசக்தி(பி3)த் துறை, நாள் 21.06.2010

2) அரசு தலைமை மின் ஆய்வாளர் மற்றும் தலைவர், மின் உரிமம் வழங்கும் வாரியம், கடித எண்.700/மி.உ.வா./இ.ஏ கிரேடு/ க.கா.2/2016, நாள் 23.06.2016

ஆணை :

மேலே முதலாவதாகப் படிக்கப்பட்ட அரசாணையில், திரு ஏ.கே.வெங்கடசாமி அவர்களை தமிழ்நாடு எலக்ட்ரிகல் இன்ஸ்டலேஷன் என்ஜினியர்ஸ் அசோசியேஷன் (ஏ கிரேடு) சங்கத்தின் சார்பாக மின் உரிமம் வழங்கும் வாரியக் குழு உறுப்பினராக 06.02.2009 முதல் 05.02.2011 வரையான காலத்திற்கு நியமனம் செய்து ஆணை வெளிடப்பட்டது.

2) மேலே இரண்டாவதாகப் படிக்கப்பட்ட கடிதத்தில், அரசு தலைமை மின் ஆய்வாளர் மற்றும் தலைவர், மின் உரிமம் வழங்கும் வாரியம் அவர்கள் அரசாணை (நிலை) எண்.1704, பொது பணித் துறை, நாள் 1.7.1986 ல் மாற்றி அமைக்கப்பட்ட மின் உரிமம் வழங்கும் வாரியத்திற்கு 1956 ஆம் ஆண்டு இந்திய மின் விதிகளில், விதி 45(1)–ன்படி

தமிழ்நாடு எலக்ட்ரிகல் இன்ஸ்டலேஷன் என்ஜினியர்ஸ் அசோசியேஷன் (ஏ கிரேடு) சார்பாக உறுப்பினர் ஒருவர் நியமனம் செய்யப்படவேண்டும் எனத் தெரிவித்து, ஏற்கெனவே இப்பதவிக்கு நியமனம் செய்யப்பட்ட உறுப்பினர் பதவிக்காலம் 15.02.2011 உடன் முடிவடைந்து விட்டதால் தமிழ்நாடு எலக்ட்ரிகல் இன்ஸ்டலேஷன் என்ஜினியர்ஸ் அசோசியேஷன் (ஏ கிரேடு) சார்பாக அதன் தலைவர் திரு.உ.பாஸ்கரன் அவர்களை மின் உரிமம் வழங்கும் வாரியத்தில் உறுப்பினராக நியமிக்க பரிந்துரை செய்துள்ளார்.

3) மேற்கண்ட அரசு தலைமை மின் ஆய்வாளர் மற்றும் தலைவர், மின் உரிமம் வழங்கும் வாரியம் அவர்களின் பரிந்துரையை அரசு கவனமுடன் பரிசீலனை செய்து, அதனை ஏற்று அரசாணை (நிலை) எண்.1704, பொதுப்பணித் துறை, நாள் 1.7.1986–இல் வெளியிடப்பட்டுள்ள ஆணைகளின் அடிப்படையில் திரு.உ.பாஸ்கரன், தலைவர், தமிழ்நாடு எலக்ட்ரிகல் இன்ஸ்டலேஷன் என்ஜினியர்ஸ் அசோசியேஷன் (ஏ கிரேடு) அவர்களை அவரது தலைவர் பதவிக்காலம் முடியும் வரை அல்லது இரண்டாண்டுகள் இவற்றில் எது முன்னர் நிகழ்கிறதோ அதுவரை தமிழ்நாடு எலக்ட்ரிகல் இன்ஸ்டலேஷன் என்ஜினியர்ஸ் அசோசியேஷன் (ஏ கிரேடு) மின் உரிமம் வழங்கும் வாரியத்தில் உறுப்பினராக நியமனம் செய்து அரசு ஆணையிடுகிறது.

(ஆளுநரின் ஆணைப்படி)

ராஜீவ் ரஞ்சன்
அரசு கூடுதல் தலைமைச் செயலாளர்.

பெறுநர்
அரசு தலைமை மின் ஆய்வாளர் மற்றும் தலைவர்,
மின் உரிமம் வழங்கும் வாரியம், கிண்டி , சென்னை–32.
திரு.உ.பாஸ்கரன், தலைவர்,
தமிழ்நாடு எலக்ட்ரிகல் இன்ஸ்டலேஷன்
என்ஜினியர்ஸ் அசோசியேஷன் (ஏ கிரேடு),
பழைய எண்.82/புதிய எண்.123, லாயிட்ஸ் என்கிளவ்,
அவ்வை சண்முகம் சாலை, இராயப்பேட்டை, சென்னை –600 014.

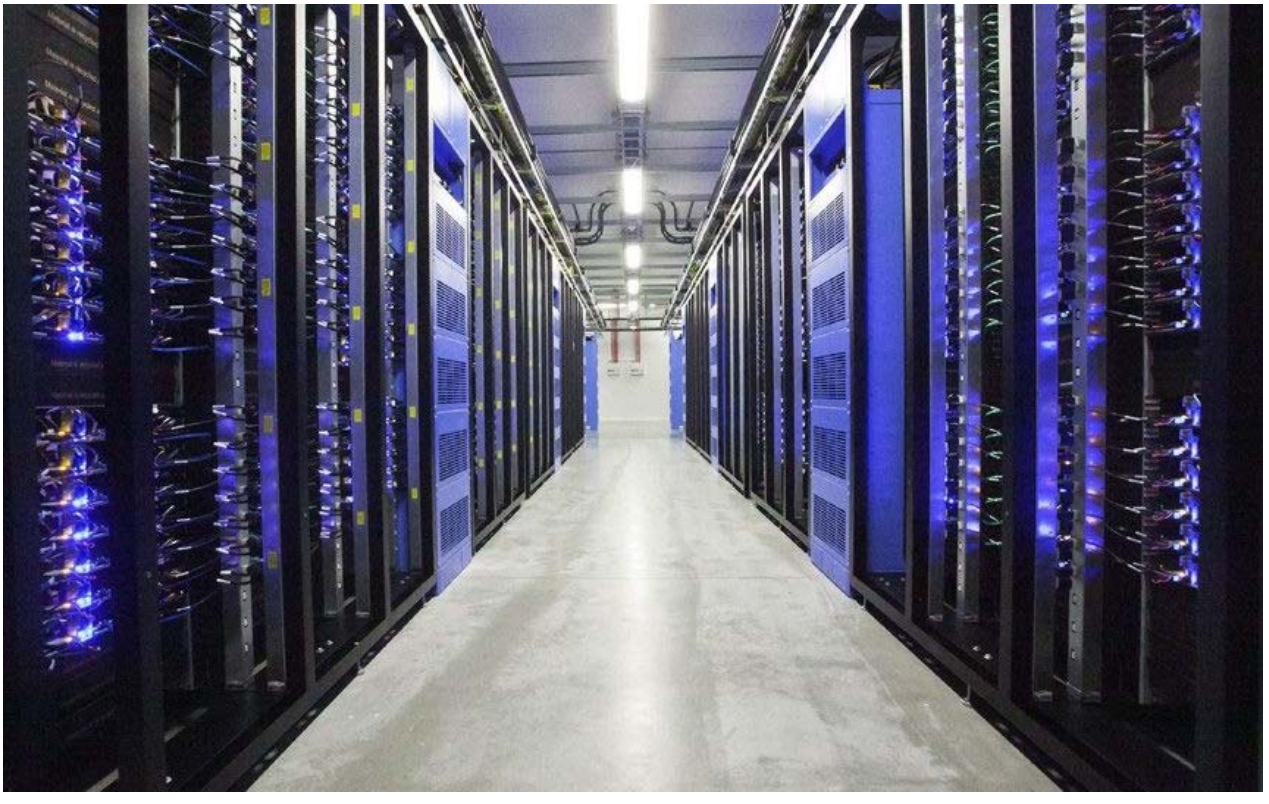
நகல்
இருப்பு கோப்பு/ உபரி.

//ஆணைப்படி அனுப்பப்படுகிறது//

பிரிவு அலுவலர்

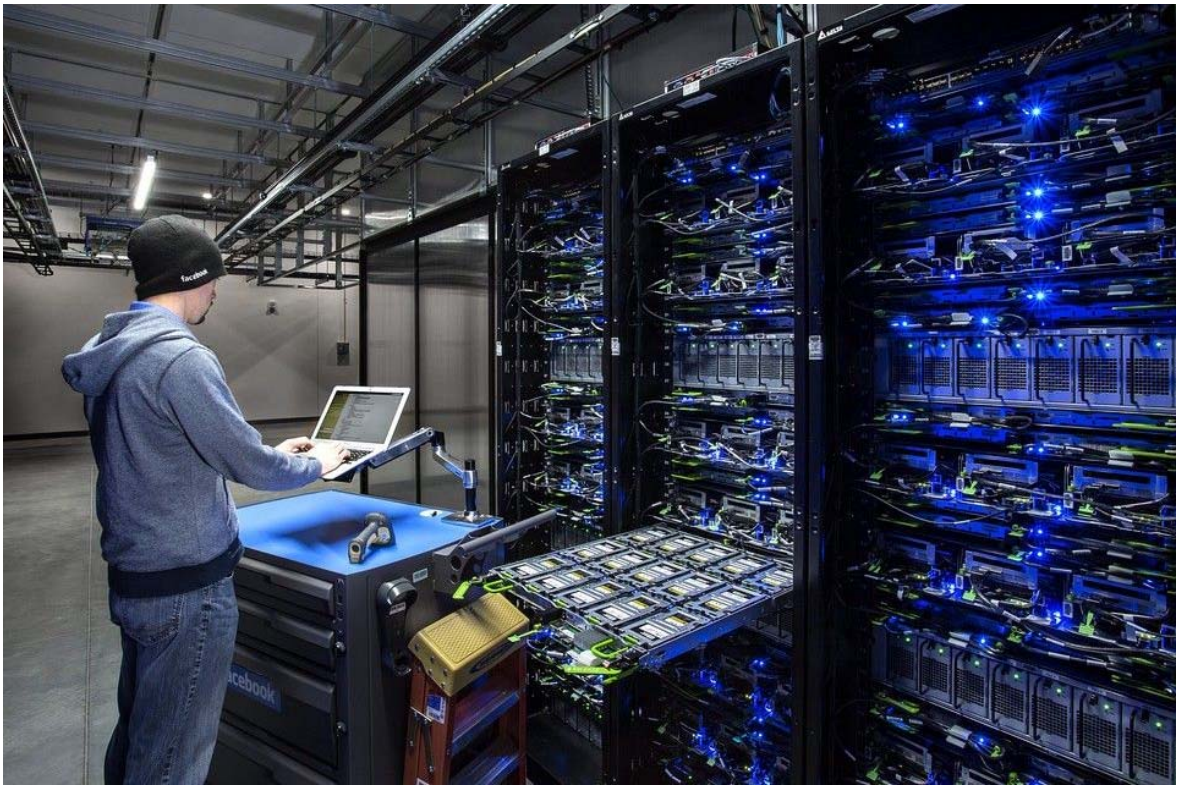
DATA CENTRES: THE NEW COOL KIDS ON THE BLOCK?

Data centres power the modern economy and keep the world's largest businesses, websites and services running, but in doing so they are also the biggest guzzlers of energy worldwide. The industry is applying new business models and technologies to change that.



Facebook, Instagram, Twitter, Amazon, Taobao – these mainstays of urban life and the wider digital economy are powered by an often-overlooked business: data centres. But these data centres are also indispensable. They house the IT operations, equipment and software of organisations across the world, which stores, processes, and disseminates information. They can be located on-site or outsourced to a third-party company that will maintain the computer servers. The world's largest search engine Google, for instance, owns 14 data centres around the world – including one in the western part of Singapore.

Data centres are among the biggest consumers of energy in the world. In Singapore, energy consumption by the country's 10 largest data centre operators is equivalent to that of 130,000 typical three-bedroom apartments, according to the Infocomm Development Authority (IDA). Singapore is Asia's data centre hub; the city-state already hosts more than half of Southeast Asia's data centre capacity and is home to the data centre operations of companies such as Alibaba and Google, therefore demand for capacity will only grow. Aaron Rasmussen, director of data centre as a service (DCaaS) operations at IO, a global data centre company, notes that "data has become a large part of people's lives within Asia". "With the increase in wealth and development of the region, more people have access to data. At the same time, there has been a proliferation of smart devices such as smartphones, tablets and wearable technology," he says.



Smart data, Smart city

Singapore, like many other cities around the world, has also embarked on a national initiative to become a Smart Nation, and plans to use digital technologies to deliver better urban services to its people. By 2030, data centres in the country will account for a significant 14 per cent of all electricity consumption in Singapore, up from about 7 per cent currently, IDA predicts. All these trends point to an increasing demand for data and computing capacity. By 2016, revenue in the data centre market will be more than $1.2 billion, up from the $1 billion in 2014.

To reduce costs and raise sustainability standards – an increasingly important aspect for businesses – industry players are looking for ways to run these spaces more efficiently. UrsIten, director of data centre global portfolio at Siemens, notes that as data centres consume a high amount of energy, "it is critical to ensure the growth is balanced with regulations which encourage or ensure the efficient use of energy". "Singapore is moving in the right direction with certifications such as Green Mark for data centres," she adds.

The modular data centre

Founded in 2007 in Phoenix, Arizona, IO is a new breed of company that configures the data centre to the application. This level of customization allows the firm to be more efficient and consume less energy than its competitors. In September 2013, IO set up its Asia Pacific headquarters in Singapore at a former Seagate manufacturing plant in the northern part of the city - the company's first outside of the US at that time. Rather than building a data centre like a construction project, and stacking IT equipment into an open raised floor, these data centres are based on prefabricated modules. This refers to purpose-built components that have

greater telemetry and standardization, allowing customers to have greater flexibility and visibility. These modules have cooling, power, security and control systems built in, as opposed to old-style data centres that typically have those systems centralized, and built ad-hoc.

A clear advantage of these modules is that customers can add or reduce the capacity when they need to, and the cooling and power options can also be adjusted accordingly, saving on electricity needs. This "data storage as a service" concept operates on the idea that it will be cheaper, faster and easier for companies to add computing capacity when they need it, says IO.

Innovate to stay ahead

Erik Verhaegen, head of the building technologies division for ASEAN at Siemens says that the company is able to provide its customers such as IO with the best possible technologies, thanks to its experience in a range of fields ranging from buildings to process industries to power and gas. "We constantly take advantage of the depth of knowledge available within our organization in order to customize our products and systems to suit varying facilities," he adds. To cope with the increase in data centre demand in a sustainable way, the industry is constantly coming up with innovations and new business models.

For example, a standard practice in the United States and Europe among data centres is the generating of solar energy during the day when sunlight is abundant, storing that energy and then using it at night. Some experts say that data centres in Singapore can consider this solution to cut down on energy consumption. Global financial company Citi's data centre in Frankfurt, Germany, for instance, is covered with green plants, helping to lower the heat of the building. This is something that Singapore's facilities can easily adopt, experts add.

The Singapore government is also implementing regulations that will make the industry more efficient. The IDA in 2015 announced its Green Data Centre Innovation Programme, which aims to help the industry adopt green data centre solutions and services. The programme will also provide funding for research and development into green technologies and develop guidelines to build a resilient computing infrastructure. These will include energy consumption and the energy efficiency of the various components of a data centre.

Verhaegen notes that the growth of the market in Singapore has been exponential, "which is why it is important for the industry leaders to come together and discuss how our technologies and innovations can ensure the growth is sustainable". "We have to be open to adopting successful practices from around the globe. Companies such as Siemens are committed to helping our customers find the balance between maximum uptime, reliability and energy efficiency," he says.

PORTAL LAUNCHED TO PROMOTE NET ZERO ENERGY BUILDINGS

New Delhi, May 27 (KNN) Ministry of Power and the United States Agency for International Development (USAID) today launched India's first integrated web portal designed to promote and mainstream Net Zero Energy Buildings (NZEB) in India.

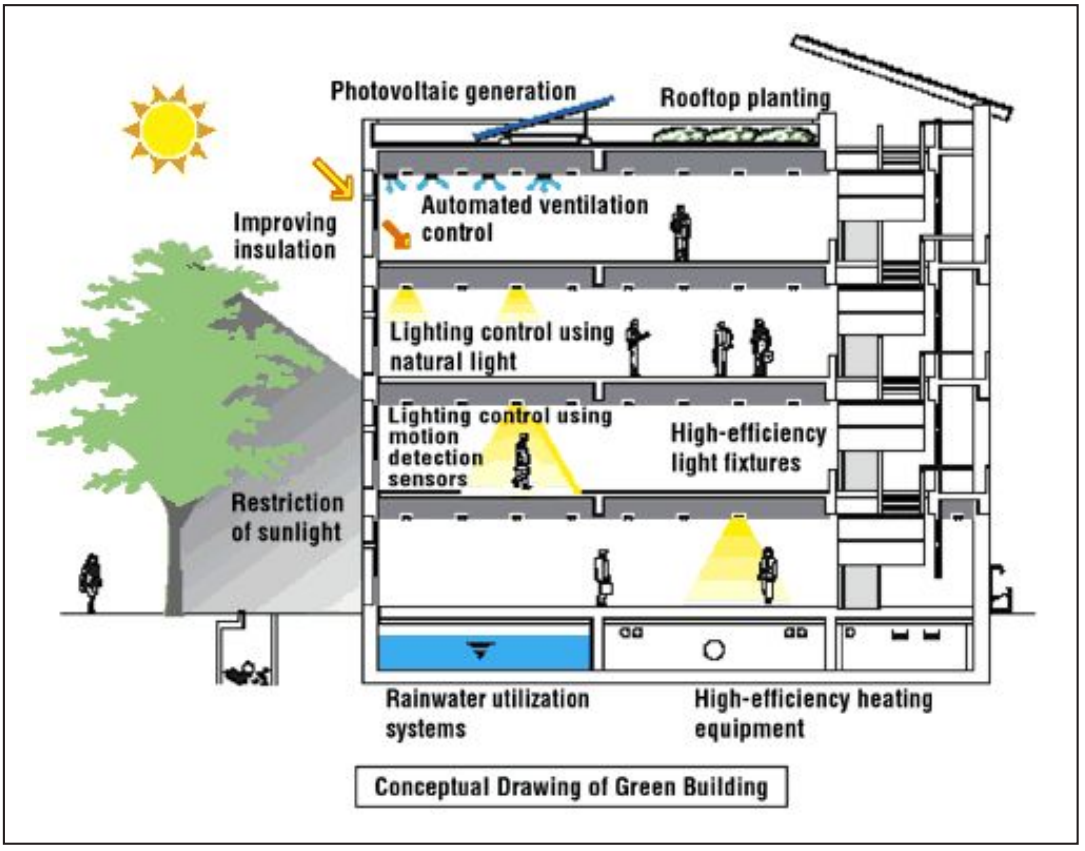
A first of its kind, the portal (www.nzeb.in) provides complete information about Net Zero Energy Buildings – those that generate as much energy as they use – as well as how to achieve near-zero energy status through the use of efficient lighting and equipment, integration of renewable energy technologies, and best practice design strategies, Ministry of Power said in a statement.

In addition, the portal hosts the NZEB Alliance, an industry-wide body setup to drive the Indian markets toward highly energy-efficient buildings.

The portal was launched by Pradeep Kumar Pujari, Secretary, Ministry of Power, and Ambassador Jonathan Addleton, USAID Mission Director to India.

Speaking on the occasion, Pujari outlined his vision to mainstream Net Zero Energy Buildings in India and said, "While it is important to implement minimum energy performance standards for buildings to reduce energy consumption, we should now start looking at the broader NZEB goal."

Pujari urged to mandate the ECBC codes in the remaining states. He also acknowledged the collaboration of the USAID and BEE in the update process of the Energy Conservation Building Code (ECBC) to reflect the market changes and technological advancement.



Congratulating the Bureau of Energy Efficiency and USAID on the culmination of their three-year effort to develop the portal, Ambassador Addleton remarked that "USAID is pleased to partner with the Government of India on this initiative to promote Net Zero Energy Buildings across India.

This portal will provide a wealth of information for policymakers, developers, architects, engineers, sustainability consultants, and academia, and will surely allow the vibrant Indian building industry to leapfrog towards energy efficiency standards and practices."

What are NZEBs?

Net or nearly zero energy buildings (NZEB) are highly efficient buildings with extremely low energy demand, which is met by renewable energy sources. Such buildings produce as much energy as they consume, accounted for annually. In order to achieve their net zero energy goals, NZEBs must first sharply reduce energy demand using energy efficient technologies, and then utilize renewable energy sources (RES) to meet the residual demand. In such buildings, efficiency gains

enable the balance of energy needs to be supplied with renewable energy technologies. This is the most logical approach to reach NZEB goal.

However, this broad definition leaves plenty of room for interpretations—and for misunderstandings among owners, architects, and other stakeholders in the NZEB project. Agreeing to a common definition of NZEB boundaries and metrics is essential to developing design goals and strategies.

Beyond this very general definition, a number of more specific definitions and terms have been put forth to better capture the specifics of how NZEB performance is achieved and measured. These specific definitions reflect the differences in priorities and perspectives among the diverse set of parties interested in NZEB buildings—for example, emphasis on demand-side versus supply-side technologies or a focus on onsite energy use versus carbon emissions—and can have an impact on design decisions (Torcellini et al. 2006).

The varying definitions of net-zero energy buildings also put forth different metrics for measuring NZEB performance and different boundaries within which the net zero balance must be maintained. This section defines the boundaries and metrics accepted globally.

Definitions of NZEB are critical in determining the path to zero energy goals, and significantly influence design choices of architects and building owners. Appropriateness of definitions to a project vary according to project goals and values of the designer and building owner, making it essential for them to understand which definition will suit their purpose best.

Net Zero

Source Energy Building

"A source ZEB produces at least as much energy as it uses in year, when accounted for at the source."

Source or primary energy is the measure of net zero status for source NZEBs. Primary energy is the energy used to generate and deliver secondary energy (predominantly electricity in the case of India) to the site.

Energy supplied to the source NZEB site and exported from it gets multiplied by site-to-source conversion factors which allows energy used for generation in power plants and transmission to be factored. Conversion factor for electricity in India, independent of the location of building, is currently assumed to be approximately three. A grid connected building with annual energy demand of 100 kWh can be qualified as a source NZEB if 300 kWh of renewable energy is supplied on-site or off-site.

Source NZEBs are a more comprehensive model of reducing the impact of building energy consumption on natural resources because primary energy is the metric used. However, they do not discern between pollution due to different fuel types nor for variations in primary energy across peak and non-peak loads. Electricity supplied at peak hours uses more primary energy than when supplied during non-peak hours.

Site-to-source conversion factors for different secondary energies are different. However, electricity is the predominant secondary energy used in India and thus difference in conversion factors can be ignored. Disparities due to primary fuel like nuclear, coal, natural gas and hydro used for producing electricity cannot be ignored if accuracy is to be maintained.

Currently, regional variations in source to site conversion used for generating electricity in India are not available. Variation in fuel types like coal, hydro and nuclear fuels has also not been computed. A single national average conversion factor for all regions and fuel types reduces the accuracy of source energy numbers.

Net Zero

Energy Cost Building

"The amount of money the utility pays the building owner for the energy the building exports to the grid is at least equal to the amount the owner pays the utility for the energy services and energy used over the year."

Cost of renewable energy exported from site must match utility bills of energy imported to the site. Essentially, a building is net zero cost energy if it recovers expenses on utility bills by selling electricity generated by renewable sources.

Utility tariff structure is crucial to cost NZEBs. Ideally, tariffs must credit both lower energy use and lower peak demands. Utility tariff structures for commercial and industrial buildings in India vary by both – energy use and peak demand. Residential utility tariff structures usually vary only by energy use.

Net zero energy cost buildings must have low peak demands and higher energy savings so that they have lower price tariffs and in turn, lower utility bills. Demand response controls are thus crucial to achieving energy cost neutrality. Cost NZEBs are also not feasible without policies like feed-in-tariff and net metering, which facilitate buying back of electricity by utilities.

Compared to site or source NZEBs, this definition will require greater installed capacity of renewable energy systems for the same building, considering buy-back rates offered by utilities are typically lower than supply tariffs. More electricity needs to be produced from a larger renewable energy system to make up for this deficit.

Solar PV is the most commonly used technology to generate electricity on site. Quantity of electricity generated through biogas plants may not be enough on its own to offset the cost of imported energy. Electricity generated in waste heat or co-generation using biofuels can also be stacked in the supply side options.

Dependent on frequently varying price structure of utilities, cost NZEBs might be easier to achieve than to maintain over the lifecycle of a building. Cost NZEBs can lose their status due to revised utility rates despite energy savings remaining unchanged. On the other hand, the building may actually be able to enhance its cost net zero status because of a favourable change in feed-in tariffs.

Cost NZEBs are exposed to certain uncertainties in the long term. Utilities will only be interested in buying back electricity if they can sell electricity generated at their power plants profitably and be able to avoid added generation costs (for adding to existing generation capacity to be able to meet demand from their service areas). Robust grid infrastructure is also needed for the grid to have stable capacity for absorbing surplus energy produced during peak and non-peak hours. With expected proliferation of energy efficient buildings and NZEBs, utilities will be able to reduce buy-back rates of on-site generated electricity to maintain their profitability and to support the required expansion of grid infrastructure, while continuing to provide dependable service to customers.

Net Zero

Energy Emission Building

"A net-zero emissions building produces at least as much emissions-free renewable energy as it uses from emissions-producing energy sources"

Emissions of net zero energy emissions building are counted for the source energy and not site energy. To determine emissions output from a building, energy used in the building is multiplied by an emissions factor which weighs emissions resulting from transportation and at-source generation.

Carbon, sulphur oxides and nitrogen oxides are included in calculating emissions neutrality. Fuel used for generating electricity supplied by the grid determines the ease of achieving net zero emissions. Emissions from electricity supplied by a nuclear plant is different than that of hydro plant, which varies from a coal fired plant.

Net zero emissions building can be zero emissions on site or off site – they can produce the equivalent renewable energy on site or purchase it. On site emissions ZEB can produce renewable energy on its footprint or the site to gain emissions neutrality. If renewable fuels are bought to the site for production, emissions from transportation and fuel production must be factored in emission neutrality calculations.

Renewable energy credits can be purchased from an off-site source to offset energy use. Alternatively, a building is emissions ZEB if it uses grid supplied electricity from renewable sources like wind farms, hydro plants, and solar plants. However, this alternative is not practically possible as of now because of the limited generation capacity of wind farms and hydro plants. Most of electricity supplied to the national grid is generated by conventional coal fired plants. Additionally, electricity from various sources is mixed in the grid prior to supply. Determining emissions accurately is complex as this ratio of renewable versus non-renewable electricity in the grid (termed fuel mix) varies, and is seldom calculated by utilities. Information about generation mix in different regions is essential before attempting net zero emission buildings with any degree of accuracy.

Emissions ZEB is the most holistic model of evaluating and reducing impact of energy used by buildings. It factors pollution and emissions across different fuels, as across different regions.

Life is a difficult game. You can win it only by retaining your birthright to be a person.
– Dr. APJ ABDUL KALAM

ANALYSIS - UTILITY SOLAR PROMOTES ENLIGHTENED APPROACH TO LAND USE

Utility solar promotes enlightened approach to land use

In overall terms the land area required for solar power systems is not a constraining factor. On average, the world's electricity supply could be generated by solar arrays covering just 0.03% of the total land area. Even in the densely populated less sunny parts of North West Europe, this only rises to a maximum of 0.26%, while Japan would need 1.22%. Given that a significant proportion of solar power is actually installed on rooftops, the pressures on productive land are even lower than this.

However, there are economic and technical benefits in installing generation near to the more populated areas. Solar developers and legislators have therefore been addressing ways to minimise the effect of utility scale solar projects on the availability of productive land.

First option – build in infertile regions

In countries where there are substantial areas of desert and infertile scrubland, this is a good place to install solar projects; especially as these regions often have high levels of solar radiation. The largest solar power stations in China, the USA, India and South Africa have all been built in this type of arid region.

Even in these regions development is not always popular. Recently for example, a further lawsuit was filed in an attempt to stop a 247 MW solar project in the Panoche Valley, because of the adverse effect this might have on blunt-nosed leopard lizards and giant kangaroo rats. The other disadvantage of many desert locations may be the distance and cost of transmitting the power to where it is needed.

Option 2 – Brownfield sites and other land redeployment

Many countries and regions may not have access to suitable arid areas, and so need to adopt other strategies to mitigate land-use.

A good place to build solar parks is on brownfield sites, especially where soil contamination or other issues makes them less suitable for other types of redevelopment. There is a growing trend, particularly in Europe and North America, to site solar projects on former landfill sites and quarries.

Many other types of previously developed land are also suitable. A prime example is the use of former airfields, especially as these are typically flat and level. This approach has been particularly widespread in Germany, the UK and France, where many airfields from the World War II and Cold War eras are no longer in service.

Even on active airfields, substantial areas are unused and offer similar benefits for solar projects. An increasing number of active airports, most recently the Indira Gandhi International Airport in Delhi, now host solar projects.

As a densely populated country where much of the terrain is mountainous, Japan has more land-use constraints than most. It has found several innovative approaches to reassigning undeveloped land for solar power projects.

Firstly, changes in trade patterns mean a lower volume of goods passing through Japanese ports than in the late 20th Century. Many of Japan's larger solar parks are therefore built near the coast on former dockside areas.

Other approaches – thinking outside the box

The popularity of golf in Japan has declined markedly since its heyday and many golf courses are no longer viable. An increasing number of solar projects are being developed on redundant Japanese golf courses, such as the 32 MW project commissioned in March at Kumenan, Okayama.

Japan is also the pioneer in avoiding land-use altogether by deploying solar arrays on water. Its largest floating solar project at 13.4 MW is being built at the Yamakura Dam in Chiba. This approach is now being followed in Europe, where Lightsource recently commissioned a 6 MW project on the Queen Elizabeth II reservoir near London.

A similar approach has been adopted in India where solar projects are being developed to cover canals. The largest to date is the 10 megawatt project on the Narmada Canal in Gujarat and more canal top projects are now under development. These projects offer a secondary advantage in reducing the evaporation of water.

Minimising use of prime agricultural land

For countries where some use of agricultural land is unavoidable, measures can be adopted to minimise the effects on the best land.

For several years, Germany has restricted green-field development to the borders of roads and railways. You can take a tour of many of Germany's solar parks without leaving its autobahn network!

The UK discourages solar park deployment on agricultural land if it is within grades 1, 2 or 3a.

About the author:

Philip Wolfe MBE has been in renewables since the 1970's when he was founder Chief Executive of BP Solar. He led companies in the PV sector until the early 2000's. Since then he has undertaken more broadly-based roles in renewable and community energy. His book on utility-scale solar was published in 2012.

HISTORY OF POWER SECTOR IN INDIA

➢ The Indian Power Industry before independence was controlled firmly by the British. Then legal and policy framework was conducive to private ownership, with not much regulation with regard to operational safety.

➢ In line with the Industrial Policy Resolution of 1948, the government played a dominant role in initiating and regulating development in key sectors of the economy, which inter alia included the Indian Electricity Sector. It was embodied in the constitution, the principle that both the Central Government and the States should be able to legislate on power.

➢ Legislative authority was more formally divided in the Electricity Supply Act of 1948. The Act provided for the establishment of the Central Electricity Authority (CEA) and of State Electricity Boards (SEBs) which were to become the main agencies for supplying power throughout India.

➢ The SEBs were autonomous bodies responsible for the development and operation of generation, transmission and distribution in the "most economical and efficient way".

➢ The CEA was to develop national plans and help formulate national power policy, to report the progress of the electricity supply industry, to provide technical assistance, to advise Central Government/ State Government/Boards/generating company, act as arbitrator between State or Board or licensees, to train personnel in the sector, to promote research and, in general, to facilitate efficient power supply. Its role, however, was essentially advisory rather than executive.

➢ The Industrial Policy Resolution of 1956 reserved the generation and distribution of electricity almost exclusively for the states, letting, existing private licensees, however, to continue. This led to the gradual domination of the electricity sector by government enterprises.

➢ Amendment in 1976 enabled generation companies to be set up by the central and state governments resulting in the establishment of National Thermal Power Corporation Ltd. (NTPC Ltd.), National Hydro Power Corporation Ltd. (NHPC), North Eastern Electric Power Corporation Ltd. (NEEPCO), Mysore (now Karnataka) Power Corporation and Water & Power Consultancy Services (a consulting firm), etc. The development of the sector took place essentially through various public sector utilities – some under the central government and the majority under the state governments – between them they accounted for more than 95% ownership.

➢ Until the 1980s, electricity services in most developing countries of the world, as also in many developed countries of Europe, were delivered by state-owned monopolies. It was considered that monopolies were best suited to deliver electricity services, as they enjoyed economies of scale and scope.

➢ In India until 1991, power sector in the states was managed by one large, vertically integrated entity that generated, transmitted and distributed power, under the respective State Ministries of Power.

➢ However, the absence of competition led to poor quality of services, sub optimal utilization of resources, and little consideration for consumer interests. The inability of state-owned enterprises to deliver services in an efficient and cost-effective manner led to reassessment of the policies relating to the provision of services, and there was a growing perception that corporatization of the sectors could improve efficiencies, quality of service and improve the bottom-line.

➢ Following UK & USA and developing countries like Argentina, Chile, Brazil, Philippines & Pakistan, the Indian government also commenced the restructuring of the Indian power sector, which commenced with the unbundling, corporatization and privatization of Orissa power utility.

➢ The Indian power sector has witnessed significant changes since early 1990s. Beginning with allowing private investment in power generation in 1991, initiating regulatory reforms through Electricity Regulatory Commissions Act, 1998, the Indian government has enacted the Electricity Act, 2003 which seeks a paradigm shift.

➢ The Electricity Act, 2003 mandates that Regulatory Commissions shall regulate tariff and issue of licenses and that State Electricity Boards (SEBs) will no longer exist in the existing form and will be restructured into separate generation, transmission and distribution entities. Regulatory function has been taken away from the purview of the government. The Electricity Act, 2003 mandates licensee-free thermal generation, non-discriminatory open access of the transmission system and gradual implementation of open access in the distribution system which will pave way for creation of power market in India.

Current Scenario

For the First time in the History of India, we will have No Power Deficit Situation in FY 2017 (ETNews)

The utility **Electricity Sector in India** had an installed capacity of 303 GW as of 30 June 2016. Renewable Power plants constituted 28% of total installed capacity and Non-Renewable Power Plants constituted the remaining 72%. The gross electricity generated by utilities is 1,106 TWh (1,106,000 GWh) and 166 TWh by captive power plants during the 2014–15 fiscal. The gross electricity generation includes auxiliary power consumption of power generation plants. India became the world's third largest producer of electricity in the year 2013 with 4.8% global share in electricity generation surpassing Japan and Russia.

During the year 2014-15, the per capita electricity generation in India was 1,010 kWh with total electricity consumption (utilities and non utilities) of 938.823 billion or 746 kWh per capita electricity consumption. Electric energy consumption in agriculture was recorded highest (18.45%) in 2014-15 among all countries. The per capita electricity consumption is lower compared to many countries despite cheaper electricity tariff in India

ENERGY CONSERVATION THROUGH ENERGY EFFICIENCY – 17

Energy Conservation through 'Overall' Efficiency Improvement of Motor Driven Systems

VFD Basics and broad application details:

Basically, Voltage should be reduced when Frequency is Reduced and

$$\frac{\text{Voltage}}{\text{Frequency}}$$ is kept constant.

The answer to the question why voltage is reduced when frequency is reduced is seen as follows:

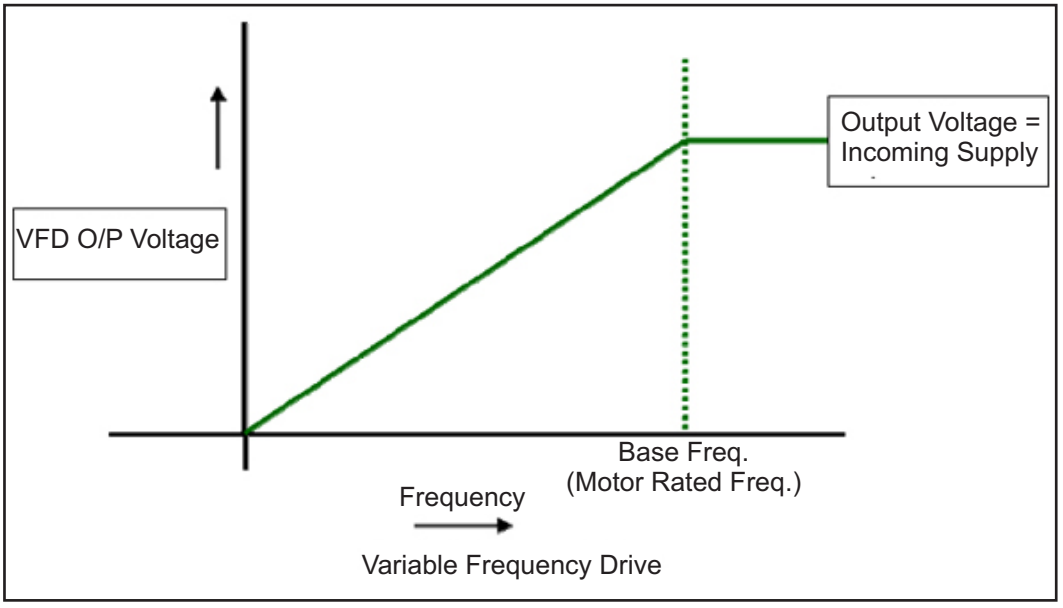
$$\text{Motor Current} = \frac{\text{Applied Voltage} - \text{Back EMF}}{\text{Impedance}}$$

EMF ∞ (Magnetic Flux) x (Speed of Rotating Magnetic Field)

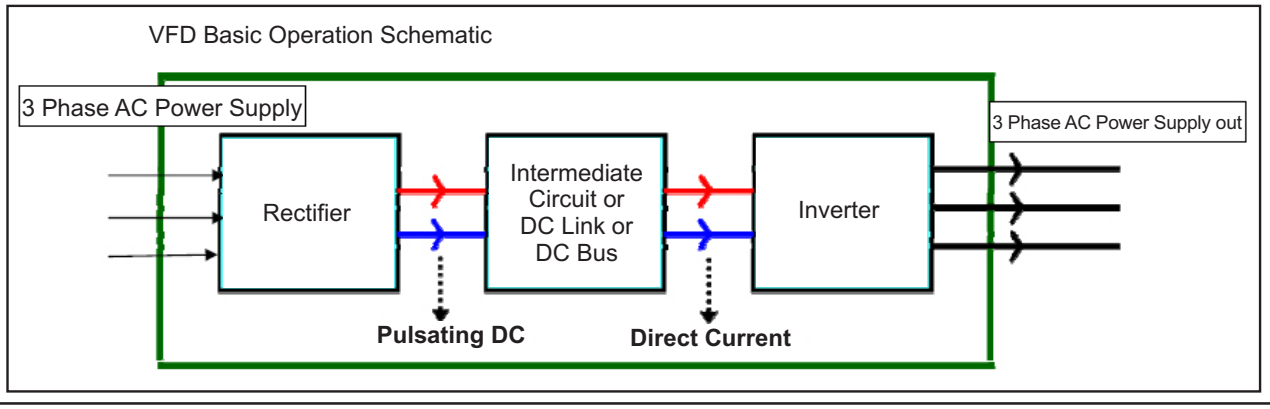
When Frequency is reduced, Motor Speed proportionately reduces, but Magnetic Flux remains almost unchanged (due to Magnetic Saturation). Hence, Back EMF reduces as per Motor Speed.

This results in Motor current becoming very high. To prevent this, applied Voltage should be reduced along with Frequency.

Variable Frequency Drive



VFD Basic Operation Schematic



Rectifier Section

It is a 3-phase Full Wave Bridge Rectifier section. The output is not pure DC. This contains Ripples.

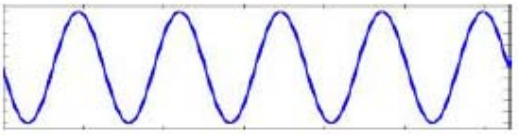
Intermediate Circuit or DC Bus

The Output of Rectifier is smoothened and stored in Capacitor.

Inverter

This section converts the DC Voltage from the Intermediate section into 3 Phase AC voltage of variable frequency and amplitude. Switching Transistors ….IGBT (Insulated Gate Bipolar Transistor) is the main element here.

The desired Output from the VFD is 3 Phase AC (Sine wave)



In the VFD, DC Voltage is converted into 3 Phase Variable AC. This can be done by using 2 Systems.

1) PAM System (Pulse Amplitude Modulation)

2) PWM System (Pulse Width Modulation)

Cautions about VFD based Speed Control of 3 Phase Induction Motor

High Speed Operation

Although VFD can generate much higher frequency than Rated Frequency of the Motor, Motor Speed cannot be increased beyond certain Speed, due to Motor Limitation (Bearing Speed, Balancing etc.)

Thumb Rule .. About 2 times the Rated Speed normally Possible

If you want more, please consult Motor Manufacturer.

Low Speed Operation

The 3Ø Induction Motor is normally available as TEFC (Totally Enclosed Fan Cooled) Motor. Fan rotates along with Rotor Shaft.

If Motor Speed is reduced below Rated Speed, accordingly Fan Speed also reduces.

The "Cooling Effect" of Fan is in square proportion to Fan Speed.

If Fan Speed is made ½, Cooling will be ¼.

This can become a serious limitation on VFD based Low Speed running of Motor.

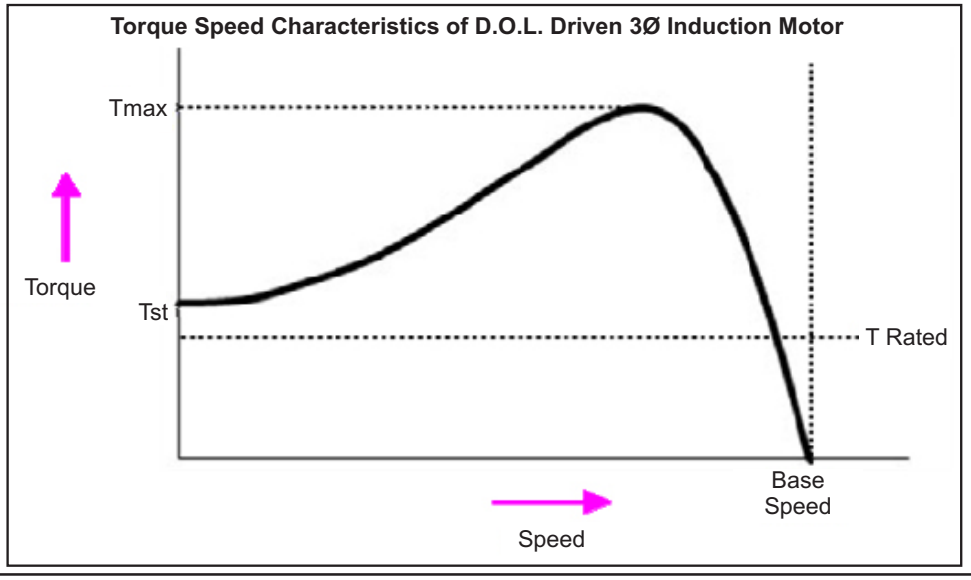
Possible Remedies

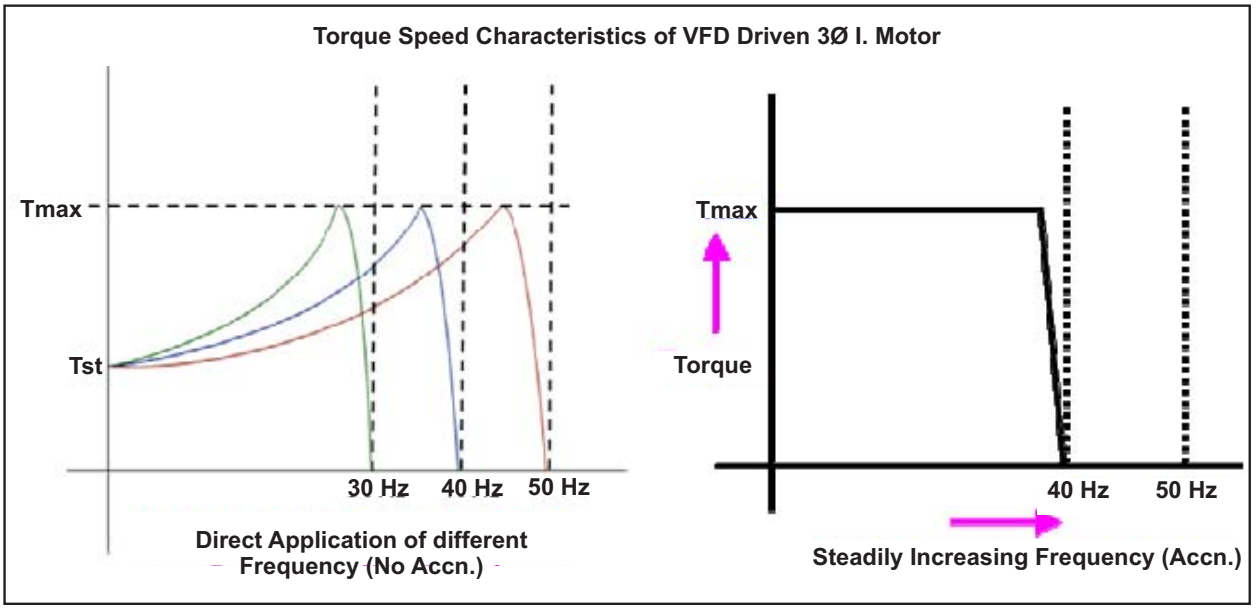
- External Cooling of Motor
- Use of Higher Rated Motor

Also Duty Cycle of Low Speed Operation to be studied properly.

Torque Speed Characteristics of Motors and the Driven with VFD:

To estimate / understand behavior of VFD Motor driven Load, it is essential to look into the basic Performance Characteristics (Torque Vs Speed) of Motors as well as Loads.





Torque Speed Characteristics of various Loads

Constant Torque Type Loads (very small Increase in Torque when Speed Increases)

Conveyors

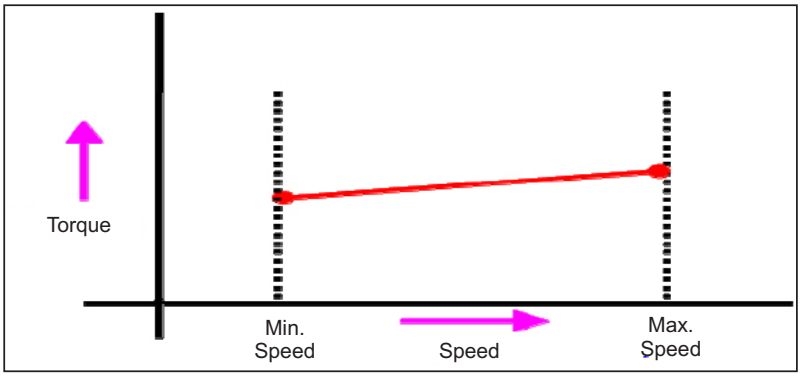
Feed Axis Drives

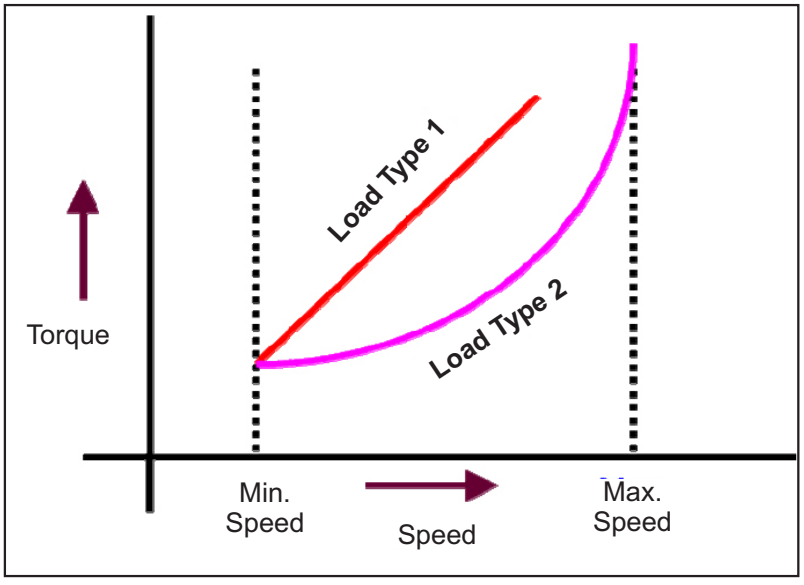
Torque Speed Characteristics of Variable Torque Loads (Increasing Power Type) – This is the Major area of Application of VFDs

Large Change in Torque requirement as Speed Increases

Pumps (Load Type 1) Shown below

Fans / Blowers (Load Type 2) Shown below





Estimation of running Speed in a Drive / Load Combination

The T/S Curves of Drive & Load if imposed on each other, then the Intersection (Common) point defines the Speed at which the Combination (Drive & Load) will run.

VFD Operation Basics (Particularly with regard to Centrifugal Loads):

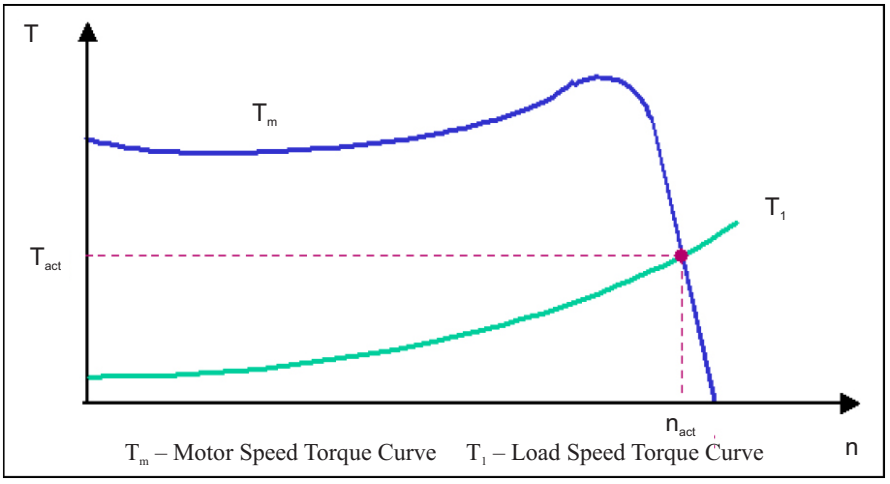
Many motion applications — particularly pumps, fans, conveyors, and mixers — require nothing more than an inexpensive drive with simple speed control. Here, a V/Hz drive is usually the best bet.

V/Hz drives are increasingly replacing older forms of motor control, including mechanical variable-speed drives, solid-state starters, and conventional motor starters.

With centrifugal loads, variable frequency drives also save energy. To illustrate, consider the "affinity laws" that govern centrifugal loads. If Q is flow, n is speed, and hp is horsepower:

Q is proportional to n P is proportional to n^2 hp is proportional to n^3

These relationships highlight the benefit of using V/Hz drives to control flow, for example, instead of dampers, inlet vanes, or throttling valves. Unlike on-off mechanisms, V/Hz drives allow power consumption to fall with flow — and a small drop in flow results in a large drop in power consumption. For example, a fan operating at 80% consumes only 51% of the energy required at 100%.



Loads ideal for VFD application: Variable Torque (centrifugal pumps, fans etc.)

Liquids and gases when moved require a pressure proportional to the square of the velocity (i.e. volume moved). The horsepower requirement varies as the cube of the speed change. These applications usually have the greatest opportunities for energy savings as well as improved control.

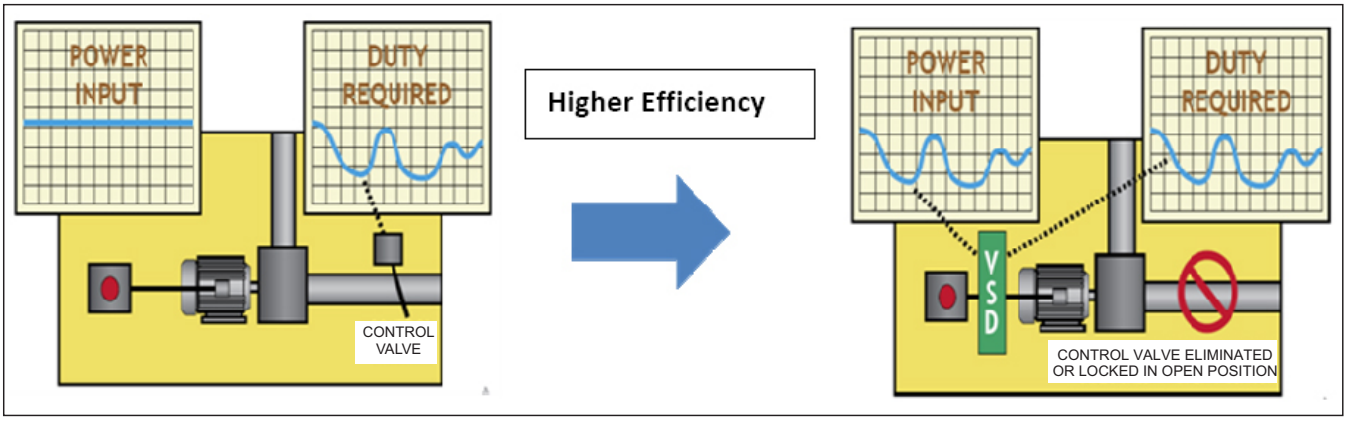
Loads requiring careful VFD application: Constant Torque loads (Positive displacement air compressors, conveyors, crushers etc)

Constant-torque loads require the same torque regardless of speed. The VFD must be carefully sized to ensure adequate starting torque. Power is proportional to speed.

Loads difficult for VFD application: Constant power loads (Machine Tools)

In this group, the load torque decreases with increasing speed. This application usually applies to processes that are changing diameters, such as lathes, winders, unwinders, and metal-cutting tools operating over wide speed ranges.

Advantage of Inverter Motor System:



As can be seen above, it is possible to Control the Speed and Torque of AC Motor to tune with the Load requirements at Continuous & Wide Range Speeds.

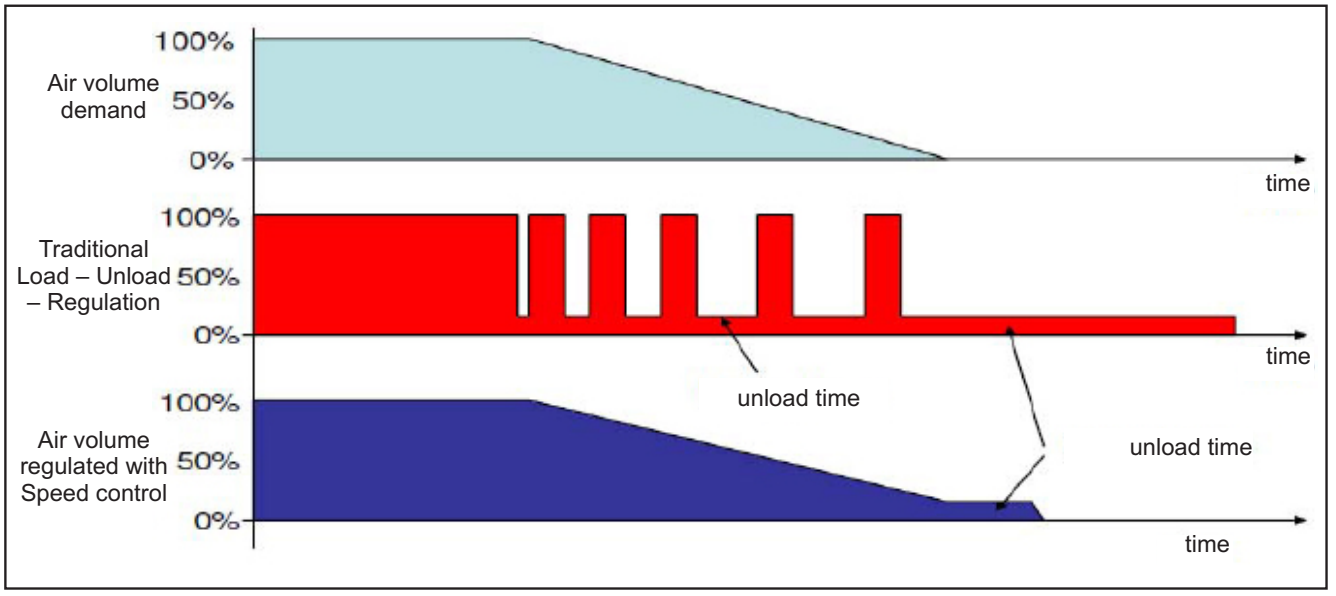
Soft Start/Stop System with the advantage of Low Starting Current is generally a part of the VFD System and helps.

As there is no Mechanical Transmission, the efficiencies are better and space requirement gets reduced considerably.

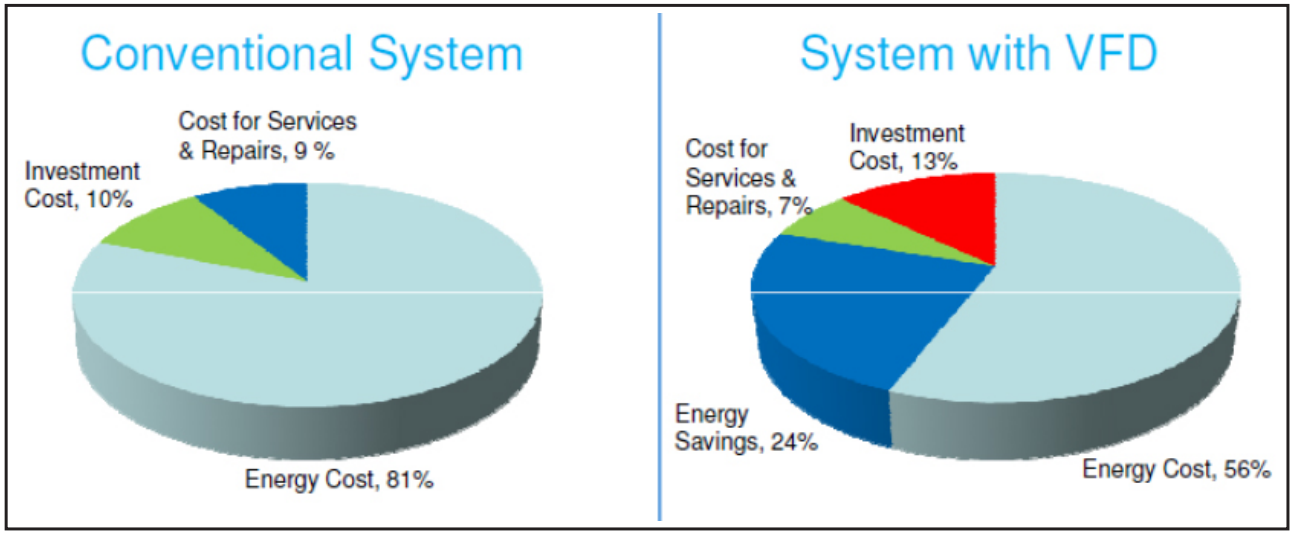
High precision & quick responses are possible in this System of VFD.

Compressors and VFD System:

By Providing VFD in compressor control we can vary the Compressor RPM depending on requirement. This completely avoids unloading and saves unload power consumption which is normally 25- 35% of the full load consumption. Motor Speed Control helps in regulating Air Volumes exactly as per demand. With this a direct relationship between Air Production and Energy Consumption is established resulting in Energy Consumption without wastage, smooth Compressor performance at optimum efficiency of the System. In addition, as generally Inverters operate on Unity Power Factor, they help reduce Peak Demand.



The Picture below gives indicative figures of various costs and comparison between 2 Systems



Major advantage of variable speed drive is that if 4 to 5 compressors are connected to a common header, then by installing VFD in one compressor, the energy saving due to pressure reduction is achieved in all the compressors.

(To be continued)

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BALVANTBHAI PAREKH | *PIDILITE INDUSTRIES* | ENTREPRENEUR

BALVANTBHAI PAREKH
Founder Fevicol Fame Pidilite Industries

Balvantbhai Parekh – Founder Fevicol Fame Pidilite Industries

We should always remind ourselves that we owe a debt to all of them whom we should repay by contributing in any small manner for Social good." Balvantbhai Parekh.

Balvantbhai was born in Mahuva in Gujarat. He received his law degree from Government Law College, Mumbai though he never wanted to practice law.

He joined a dyeing and printing press in Mumbai, and later got the job as a peon in a wood trader's office. He used to stay in a godown with his wife. Balvantbhai later started importing cycle, paper, dyes, from countries from western countries. He later joined Fedco, a German firm representing German company Hoechst. He was offered fifty percent partnership in profit earned from imports of Fedco. He founded the Partnership Firm called Parekh Dyechem Industries along with his brothers, Sushil kumar and Narendra Kumar. The company was rechristened as Pidilite Industries in 1989. He wanted to try- his destiny in the city of Dreams, Mumbai. But because of adverse circumstances he had to do jobs not in keeping with his degree. When he came to Mumbai his pockets carried nothing but his dreams. Today he is a billionaire. His name has appeared in Forbes Magazine, a rare distinction for an Industrialist. Pidilite Industries Limited has been a pioneer in consumer and specialties chemicals in India. Its products include Adhesives and Sealants, Construction and Paint Chemicals, Automotive Chemicals, Industrial and Textile Resins and Organic Pigments and Preparations. Pidilite is also growing its international presence through acquisitions and setting up manufacturing facilities and sales offices in important regions around the world. Producer of several popular brands including Fevicol, Ranipal, M-Seal, Dr. Fixit, Pidilite Industries boasts an annual turnover of Rs. 2,395.60 crore.

Balvantbhai had helped setting up an Arts and Science college in Mahua. He donated Rs 2 crore for Bhavnagar's Science city project and also gave donation to Gujarati Sahitya Parishad.

Balvantbhai passed away in January 25, 2013 in Mumbai. He was 90. In recognition of his *"outstanding contributions and service to the cause of General Semantics,"* the Institute of General Semantics conferred on him **J. Talbot Winchell Award in 2011**.

MIRROR

One day all the employees reached the office and saw a big advice written on the door.

Yesterday the person who has been stopping your growth in this company passed away. You are invited to join the funeral.

In the beginning, they got sad for the death of one of their colleagues, but after a while they got curious to know who was the man who stopped their growth.

Everyone thought: *Well atleast the man who stopped my progress died!*

One by one the thrilled employees got closer to the coffin, and when they looked inside they were speechless. They stood shocked in silence, as if someone had touched the deepest part of their soul. There was a mirror inside the coffin and everyone who looked inside could see himself.

There was a sign next to the mirror that read:

There is only one person who is capable to set limits to your growth...It is you. Y**ou are the only person who can influence your happiness, success and realization.**

Your life does not change when your boss friends or company change.....your life changes when you change...you go beyond your limiting beliefs and you realize you are the only one responsible for your life.

Its the way you face life that makes the difference!

If an egg is broken from outside force....life ends but if it is broken from inside force life begins. **Great things always begin from within.**

Every time you LOOK in the MIRROR, REMEMBER that GOD CREATED YOU and that EVERYTHING HE CREATES is BEAUTIFUL and GOOD. – JOYCE MEYER

BIG, BEAUTIFUL AND SUSTAINABLE – 10 OF THE WORLD'S MOST ENERGY EFFICIENT OFFICES - 1

We're entering a new age in the built environment — one where we expect our buildings to deliver far more than just a place to work or live.

We want buildings that inspire us whilst also helping the environment. These 10 ground-breaking offices are taking efficiency to a new level, and are great examples of sustainability that will drop jaws as well as carbon emissions. Discover what technologies and practices they are exploiting in order to reduce their impact.

ONE ANGEL SQUARE, MANCHESTER (UK)

One Angel Square is the home of The Co-Operative Group's headquarters in Manchester, United Kingdom. The distinctive 15-storey building, which boasts a double skin facade, has its own source of heat and power generation courtesy of a CHP (combined heat and power) plant located within the building. It also has an intelligent heat recovery system that takes heat generated by the IT systems and reuses it to heat the building.

Alongside more complex systems, the building also implements more familiar technologies including low energy LED lights and IT systems, greywater and rainwater recycling systems for toilet flushing and irrigation as well as high efficiency passenger lifts. The building is designed to save 40-60% of the current energy cost incurred by a standard head office building and it achieved an '**Outstanding**' rating under the **BREEAM** environmental rating scheme.

(To be continued...)

THE WORLDS TOP 10 MOST INNOVATIVE COMPANIES IN ENERGY - 1

TESLA MOTORS

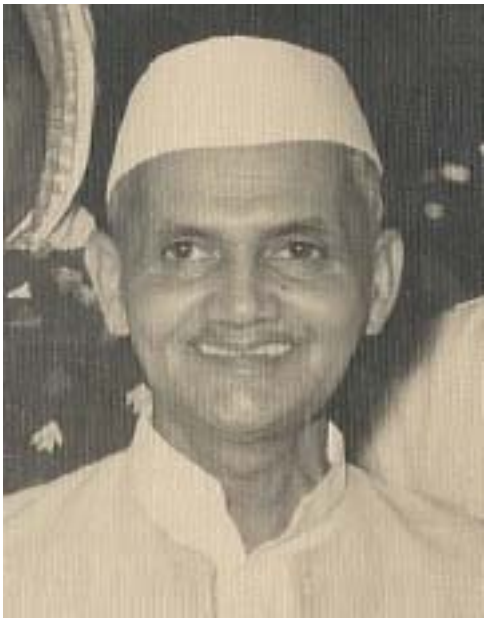
For obliterating the major barrier to wider adoption of electric vehicles. Sure, Tesla has carved out an undisputed lead in the electric-car industry with its revolutionary Model S, but the unveiling of the company's charging stations was equally noteworthy and less heralded. Billed as "the fastest charging station on the planet"—because it is—the Tesla Supercharger can fuel up a Model S in as little as 40 minutes, removing the so-called range anxiety that has been the biggest bugaboo of EV doubters. But in January, Tesla took another leap: It expanded its rapid-charging station route to more than 70 locations, letting Model S owners drive coast-to-coast for the first time.

(To be continued...)

LAL BAHADUR SHASTRI - 1

2nd Prime Minister of India

Lal Bahadur Shastri, (2 October 1904 – 11 January 1966) was the **Prime Minister** of the Republic of India and a leader of the **Indian National Congress party**.



Shastri joined the Indian independence movement in the 1920s. Deeply impressed and influenced by Mahatma Gandhi (with whom he shares his birthday), he became a loyal follower, first of Gandhi, and then of Jawaharlal Nehru. Following independence in 1947, he joined the latter's government and became one of Prime Minister Nehru's principal lieutenants, first as **Railways Minister** (1951–56), and then in a variety of other functions, including **Home Minister**. Shastri was chosen as Nehru's successor owing to his adherence to Nehruvian socialism after Nehru's daughter Indira Gandhi turned down Congress President K. Kamaraj's offer of premiership.

Shastri as Prime Minister continued Nehru's policies of non-alignment and socialism. He led the country during the Indo-Pakistan War of 1965. His slogan of "**Jai Jawan Jai Kisan**" ("**Hail the soldier, Hail the farmer**") became very popular during the war and is remembered even today. The war formally ended with the Tashkent Agreement of 10 January 1966; he died of a heart attack the following day, still in Tashkent.

Early years (1904–1917)

Shastri was born at the house of his maternal grandparents in Mughalsarai, Varanasi as Lal Bahadur Shrivastava, into a Hindu Kayastha family that had traditionally been employed as Highly administrators and civil servants. Shastri's paternal ancestors had been in the service of the zamindar of Ramnagar near Varanasi and Shastri lived there for the first one year of his life. Shastri's father, Sharada Prasad Shrivastava, was a school teacher who later became a clerk in the revenue office at Allahabad, while his mother, Ramdulari Devi, was the daughter of Munshi Hazari Lal, the headmaster and English teacher at a railway school in Mughalsarai. Shastri was the second child and eldest son of his parents; he had an elder sister, Kailashi Devi.

In April 1906, When Shastri was hardly one year old, his father, had only recently been promoted to the post of deputy tahsildar, died in an epidemic of bubonic plague. Ramdulari Devi, then only 23 and pregnant with her third child, took her two children and moved from Ramnagar to her father's house in Mughalsarai and settled there for good. She gave birth to a daughter, Sundari Devi, in July 1906. Thus, Shastri and his sisters grew up in the household of his maternal grandfather, Hazari Lal. However, Hazari Lal himself died from a stroke in mid-1908, after which the family were looked after by his brother (Shastri's great-uncle) Darbari Lal, who was the head clerk in the opium regulation department at Ghazipur, and later by his son (Ramdulari Devi's cousin) Bindeshwari Prasad, a school teacher in Mughalsarai. Thus, the greatness of the traditional Indian joint family system, and the traditions of family responsibility and kinship, are deeply evident in Shastri's case, where the orphan child of a penniless widow was raised by his distant relatives in a manner which enabled him to become Prime Minister of India.

In Shastri's family, as with many Kayastha families, it was the custom in that era for children to receive an education in the Urdu language and culture. This is because Urdu/Persian had been the language of government for centuries, before being replaced by English, and old traditions persisted into the 20th century. Therefore, Shastri began his education at the age of four under the tutelage of a *maulvi* (a Muslim cleric), Budhan Mian, at the East Central Railway Inter college in Mughalsarai. He studied there until the sixth standard. In 1917, Bindeshwari Prasad (who was now head of the household) was transferred to Varanasi, and the entire family moved there, including Ramdulari Devi and her three children. In Varanasi, Shastri joining the seventh standard at Harish Chandra High School. At this time, he decided to drop his caste-derived surname of "Varma" (which is a traditional optional surname for all Kayastha families).

The young *satyagrahi* (1921–1945)

While Shastri's family had no links to the independence movement then taking shape, among his teachers at Harish Chandra High School was an intensely patriotic and highly respected teacher named Nishkameshwar Misra, who gave Shastri much-needed financial support by allowing him to tutor his children. Inspired by Misra's patriotism, Shastri took a deep interest in the freedom struggle, and began to study its history and the works of several of its noted personalities, including those of Swami Vivekananda, Bal Gangadhar Tilak, Gandhi and Annie Besant. In January 1921, when Shastri was in the 10 standard and three months from sitting the final examinations, he attended a public meeting in Benares hosted by Gandhi and Pandit Madan Mohan Malaviya. Inspired by the Mahatma's call for students to withdraw from government schools and join the non-cooperation movement, Shastri withdrew from Harish Chadra the next day and joined the local branch of the Congress Party as a volunteer, actively participating in picketing and anti-government demonstrations. He was soon arrested and jailed, but was then let off as he was still a minor. Shastri's immediate supervisor was a former Benares Hindu University lecturer named J.B. Kripalani, who would become one of the most prominent leaders of the Indian independence movement and among Gandhi's closest followers. Recognising the need for the younger volunteers to continue their educations, Kripalani and a friend, V.N. Sharma, had founded an informal school centered around "nationalist education" to educate the young activists in their nation's heritage. With the support of a wealthy philanthropist and ardent Congress nationalist, Shiv Prasad Gupta, the Kashi Vidyapith was inaugurated by Gandhi in Benares as a national institution of higher education on 10 February 1921. Among the first students of the new institution, Shastri graduated with a first-class degree in philosophy and ethics from the Vidyapith in 1925. He was given the title *Shastri* ("scholar"). The title was a bachelor's degree awarded by the Vidyapith, but it stuck as part of his name.

Shastri enrolled himself as a life member of the Servants of the People Society (Lok Sevak Mandal), founded by Lala Lajpat Rai, and began to work for the betterment of the Harijans under Gandhi's direction at Muzaffarpur. Later he became the President of the Society.

Independence activism

Shastri participated in the Salt Satyagraha in 1930. He was imprisoned for two and a half years. Later, he worked as the Organizing Secretary of the Parliamentary Board of U.P. in 1937. In 1940, he was sent to prison for one year, for offering individual Satyagraha support to the independence movement.

On 8 August 1942, Mahatma Gandhi issued the Quit India speech at Gowalia Tank in Mumbai, demanding that the British leave India. Shastri, who had just then come out after a year in prison, travelled to Allahabad. For a week, he sent instructions to the independence activists from Jawaharlal Nehru's home, Anand Bhavan. A few days later, he was arrested and imprisoned until 1946. Shastri spent almost nine years in jail in total. During his stay in prison, he spent time reading books and became familiar with the works of western philosophers, revolutionaries and social reformers.

Political career (1947–64)

State minister

Following India's independence, Shastri was appointed Parliamentary Secretary in his home state, Uttar Pradesh. He became the Minister of Police and Transport under Govind Ballabh Pant's Chief Minister ship on 15 August 1947 following Rafi Ahmed Kidwai's departure to become minister at centre. As the Transport Minister, he was the first to appoint women conductors. As the minister in charge of the Police Department, he ordered that police use jets of water instead of lathis to disperse unruly crowds. His tenure as police minister (As Home Minister was called prior to 1950) saw successful curbing of communal riots in 1947, mass migration and resettlement of refugees.

Cabinet minister

In 1951, Shastri was made the **General Secretary of the All-India Congress Committee** with Jawaharlal Nehru as the Prime Minister. He was directly responsible for the selection of candidates and the direction of publicity and electioneering activities. He played an important role in the landslide successes of the Congress Party in the Indian General Elections of 1952, 1957 and 1962. In 1952, he successfully contested UP Vidhansabha from Soraon North cum Phulpur West seat and won getting over 69% of vote. He was believed to be retained as home minister of UP, but in a surprise move was called to Centre as minister by Nehru.

He was elected to Rajya Sabha from Uttar Pradesh w.e.f. 3 April 1952. He served as the Minister of Railways and Transport in the Central Cabinet from 13 May 1952 to 7 December 1956. In September 1956, he offered his resignation after a railway accident at Mahbubnagar that led to 112 deaths. However, Nehru did not accept his resignation. Three months

later, he resigned accepting moral and constitutional responsibility for a railway accident at Ariyalur in Tamil Nadu that resulted in 144 deaths. While speaking in Parliament on the incident, Nehru stated that he was accepting the resignation because it would set an example in constitutional propriety and not because Shastri was in any way responsible for the accident.

As the Railway Minister Shastri installed the 1st Machine at Integral Coach Factory ICF Chennai on 20.02.1955.

In 1957, Shastri returned to the Cabinet following the General Elections, first as the **Minister for Transport and Communications**, and then as the **Minister of Commerce and Industry**. In 1961, he became **Home Minister.** As Union Home Minister, he was instrumental in appointing the Committee on Prevention of Corruption under the Chairmanship of K. Santhanam. During his tenure as Home Minister he created the famous "**Shastri Formula**" to contain the language agitations in the states of Assam and Punjab acceptable to all section of people. He handled well the Hazrathbal Mosque sacred missing relic incident in Jammu and Kashmir and the crises between the Chief Minister and his deputy in the state government of Kerala in 1962.

Prime minister of India (1964–66)

Jawaharlal Nehru died in office on 27 May 1964 and left a void. Then Congress Party President K. Kamaraj was instrumental in making Shastri Prime Minister on 9 June. Shastri, though mild-mannered and soft-spoken, was a Nehruvian socialist and thus held appeal to those wishing to prevent the ascent of conservative right-winger Morarji Desai.

In his first broadcast as Prime Minister, on 11 June 1964, Shastri stated: *"There comes a time in the life of every nation when it stands at the cross-roads of history and must choose which way to go. But for us there need be no difficulty or hesitation, no looking to right or left. Our way is straight and clear—the building up of a socialist democracy at home with freedom and prosperity for all, and the maintenance of world peace and friendship with all nations"*.

Domestic policies

Shastri retained many members of Nehru's Council of Ministers. T. T. Krishnamachari was retained as the Finance Minister of India, as was Defence Minister Yashwantrao Chavan. He appointed Swaran Singh to succeed him as External Affairs Minister. He also appointed Indira Gandhi, daughter of Jawaharlal Nehru and former Congress President, as the Minister of Information and Broadcasting. Gulzarilal Nanda continued as the Minister of Home Affairs.

Shastri's tenure witnessed the Madras anti-Hindi agitation of 1965. The government of India had for a long time made an effort to establish Hindi as the sole national language of India. This was resisted by the non-Hindi speaking states particularly Madras State. To calm the situation, Shastri gave assurances that English would continue to be used as the official language as long the non-Hindi speaking states wanted. The riots subsided after Shastri's assurance, as did the student agitation.

Economic policies

Shastri continued Nehru's socialist economic policies with central planning. He promoted the White Revolution – a national campaign to increase the production and supply of milk – by supporting the Amul milk co-operative of Anand, Gujarat and creating the National Dairy Development Board.

He visited Anand on 31 October 1964 for inauguration of the Cattle Feed Factory of Amul at Kanjari. As he was keenly interested in knowing the success of this co-operative, he stayed overnight with farmers in a village, and even had dinner with a farmer's family. He discussed his wish with Mr Verghese Kurien, then the General Manager of Kaira District Co-operative Milk Producers' Union Ltd (Amul) to replicate this model to other parts of the country for improving the socio-economic conditions of farmers. As a result of this visit, the **National Dairy Development Board (NDDB)** was established at Anand in 1965. While speaking on the chronic food shortages across the country, Shastri urged people to voluntarily give up one meal so that the food saved could be distributed to the affected populace. However he ensured that he first implemented the system in his own family before appealing to the country. He went on air to appeal to his countrymen to skip a meal a week. The response to his appeal was overwhelming. Even restaurants and eateries downed the shutters on Monday evenings. Many parts of the country observed the "**Shastri Vrat**". He motivated the country to maximize the cultivation of food grains by ploughing the lawn himself, at his official residence in New Delhi.

During the 22-day war with Pakistan in 1965, On 19 October 1965, Shastri gave the seminal '**Jai Jawan Jai Kishan**' ("**Hail the soldier, Hail the farmer**") slogan at Urwa in Allahabad that became a national slogan.

Underlining the need to boost India's food production. Shastri also promoted the Green Revolution. Though he was a socialist, Shastri stated that India cannot have a regimented type of economy.

The Food Corporation of India was set up under the Food Corporation's Act 1964. Also **The National Agricultural Products Board Act.**

Jai Jawan Jai Kisan

For the outstanding slogan given by him during Indo-Pak war of 1965 Ministry of Information and Broadcasting (India) commemorated Shastriji even after 47 years of his death on his 48th martyr's day: Former Prime Minister Lal Bahadur Shastri was one of those great Indians who has left an indelible impression on our collective life. Shri Lal Bahadur Shastri's contribution to our public life were unique in that they were made in the closest proximity to the life of the common man in India. Shri Lal Bahadur Shastri was looked upon by Indians as one of their own, one who shared their ideals, hopes and aspirations. His achievements were looked upon not as the isolated achievements of an individual but of our society collectively.

Under his leadership India faced and repulsed the Pakistani invasion of 1965. It is not only a matter of pride for the Indian Army but also for every citizen of the country. Shri Lal Bahadur Shastri's slogan **Jai Jawan! Jai Kisan!!** reverberates even today through the length and breadth of the country. Underlying this is the inner-most sentiments '**Jai Hind**'. The war of 1965 was fought and won for our self-respect and our national prestige. For using our Defence Forces with such admirable skill, the nation remains beholden to Shri Lal Bahadur Shastri. He will be remembered for all times to come for his large heartedness and public service.

Foreign policies

Shastri continued Nehru policy of non-alignment but also built closer relations with the Soviet Union. In the aftermath of the Sino-Indian War of 1962 and the formation of military ties between the Chinese People's Republic and Pakistan, Shastri's government decided to expand the defence budget of India's armed forces.

In 1964, Shastri signed an accord with the Sri Lankan Prime minister Sirimavo Bandaranaike regarding the status of Indian Tamils in the then Ceylon. This agreement is also known as the **Sirima-Shastri Pact** or the **Bandaranaike-Shastri pact.**

Under the terms of this agreement, 600,000 Indian Tamils were to be repatriated, while 375,000 were to be granted Sri Lankan citizenship. This settlement was to be done by 31 October 1981. However, after Shastri's death, by 1981, India had taken only 300,000 Tamils as repatriates, while Sri Lanka had granted citizenship to only 185,000 citizens (plus another 62,000 born after 1964). Later, India declined to consider any further applications for citizenship, stating that the 1964 agreement had lapsed.

India's relationship with Burma had been strained after the 1962 Military coup followed by the repatriation of many Indian families in 1964 by Burma. While the central government in New Delhi monitored the overall process of repatriation and arranged for identification and transportation of the Indian returnees from Burma, it fell under the responsibilities of local governments to provide adequate facilities to shelter the repatriates upon disembarkation on Indian soil. Particularly in the Madras State the Chief Minister during that time Mr. Minjur K. Bhaktavatsalam showed great care in rehabilitation of the returnees. In December 1965 Lal Bahadur Shastri made an official visit with his Family to Rangoon, Burma and re-established cordial relations with the country's military government of General Ne Win.

War with Pakistan

Shastri's greatest moment came when he led India in the 1965 Indo-Pak War.

Laying claim to half the Kutch peninsula, the Pakistani army skirmished with Indian forces in August, 1965. In his report to the Lok Sabha on the confrontation in Kutch, Shastri stated:

In the utilization of our limited resources, we have always given primacy to plans and projects for economic development. It would, therefore, be obvious for anyone who is prepared to look at things objectively that India can have no possible interest in provoking border incidents or in building up an atmosphere of strife... In these circumstances, the duty of Government is quite clear and this duty will be discharged fully and effectively... We would prefer to live in poverty for as long as necessary but we shall not allow our freedom to be subverted.

In September 1965, major incursions of militants and Pakistani soldiers began, hoping not only to break down the government but incite a sympathetic revolt. The revolt did not happen, and India sent its forces across the Ceasefire Line (now Line of Control) and threatened Pakistan by crossing the International Border near Lahore as war broke out on a general scale. Massive tank battles occurred in the Punjab, and while the Pakistani forces made gains in the northern part of subcontinent, Indian forces captured the key post at Haji Pir, in Kashmir, and brought the Pakistani city of Lahore under artillery and mortar fire.

(To be continued...)

HUMOUR - LOGIC

Ashok, a fresh computer graduate from a world-class University, goes for an interview in a software company.

The interviewer is Sunder, a grubby old man. And the first question he asks Ashok is, 'Are you good at logic?'

'Of course,' replies Ashok.

'Let me test you,' replies Sunder. 'Two men come down a chimney. One comes with a clean face and the other comes out with a dirty face. Which one would wash his face?'

Ashok stares at Sunder. 'Is that a test in Logic?' Sunder nods.

'The one with the dirty face washes his face', Ashok answers wearily.

'Wrong. The one with the clean face washes his face. Examine the simple logic. The one with the dirty face looks at the one with the clean face and thinks his face is clean. The one with the clean face looks at the one with the dirty face and thinks his face is dirty. So, the one with the clean face washes his face.'

'Hmm. I never thought of that," says Ashok. 'Give me another test.'

Sunder holds up two fingers, 'Two men come down a chimney. One comes out with a clean face and the other comes out with a dirty face. Which one washes his face?'

'We have already established that. The one with the clean face washes his face.'

'Wrong. Each one washes one's face. Examine the simple logic. The one with the dirty face looks at the one with the clean face and thinks his face is clean. The one with the clean face looks at the one with the dirty face and thinks his face is dirty. So, the one with the clean face washes his face. When the one with the dirty face sees the one with the clean face washing his face, he also washes his face. So each one washes one's face.'

'I didn't think of that!' says Ashok. 'It's shocking to me that I could make an error in logic. Test me again!'

Sunder holds up two fingers, 'Two men come down a chimney. One comes out with a clean face and the other comes out with a dirty face. Which one washes his face?'

'Each one washes his face.'

'Wrong. Neither one washes his face. Examine the simple logic. The one with the dirty face looks at the one with the clean face and thinks his face is clean. The one with the clean face looks at the one with the dirty face and thinks his face is dirty. But when the one with clean face sees that the one with the dirty face doesn't wash his face, he also doesn't wash his face. So neither one washes his face.'

Ashok is desperate. 'I am qualified for this job. Please give me one more test!'

He groans when Sunder lifts his two fingers, 'Two men come down a chimney. One comes out with a clean face and the other comes out with a dirty face. Which one washes his face?'

'Neither one washes his face', Ashok replies, 'I have learnt this logic.'

'Wrong, again. Do you now see, Ashok, why programming knowledge is insufficient for this job? Tell me, how is it possible for two men to come down the same chimney, and for one to come out with a clean face and the other with a dirty face? Don't you see the flaw in the premise?'"

POWER YOUR MIND - RELIGION FOR WHOM?

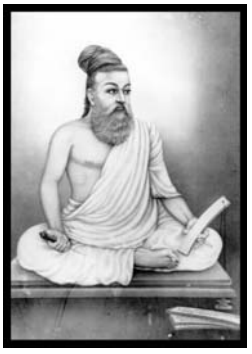
Religion is not for the weak
For they try to compromise;
Religion is not for the coward
For they try to escape;
Religion is not for the hypocrite
For they try to hide;
Religion is not for the timid
For they are always afraid;
Religion is not for the mean
For they always try to degrade;
Religion is not for fanatics
For they always try to destroy;
Religion is not for lunatics
For they always Misunderstand;

Courtesy: Swami Srikantananda

Religion is not for the crooked
For they always misinterpret;
Religion is not for fools
For they always get confused;

Religion is for those who are
Bold, heroic, courageous,
Strong, Intelligent,
Broadminded, matured,
Simple and are ready to
Face any number of
Obstacles in order to
Practise Dharma *but never*
Surrender to wickedness.

TIRUKKURAL AND MANAGEMENT IN A 'NUTSHELL' – 40



KURALS provide guidance for every one in every walk of life including Professionals, Managers and Management. One of the important characteristics of effective Management is Communication, both written and verbal, and Tiruvalluvar deals with this in all its aspects and the Power obtained by the Leader and the Manager through **'Proper Communication'**. The following Kurals chosen out of many on the subject will illustrate the importance and the power.

Thiranarinthu Solluga Sollai; Aranum
Porulum Athaninwuungu Il ***Kural 644***

திறன்அறிந்து சொல்லுக சொல்லை அறனும்
பொருளும் அதனின்ஊஉங்கு இல் குறள் 644

"Weigh each circumstance aright and the speak the speech that is fit: for the increase of righteousness and profit, there is no other thing of more worth to thee than them"

Virainthu Thozhilketkum Gnalam
Niranthuinithu
Solluthal Vallarp Perin ***Kural 648***

விரைந்து தொழில்கேட்கும் ஞாலம்
நிரந்துஇனிது
சொல்லுதல் வல்லார்ப் பெறின் குறள் 648

"Behold the men whose speech is well ordered and couched in persuasive language: the World will be at their beck and call"

Palasollak Kamuruvar Manramasu Atra
Silasollal Thetra Thavar ***Kural 649***

பலசொல்லக் காமுறுவர் மன்றமாசு அற்ற
சிலசொல்லல் தேற்றா தவர் குறள் 649

"Verily they have a passion for much speaking who know not to say their mind in few and well chosen words"

Solalvallan Sorvuilan Anjan: Avanai
Igalvellal Yaarkkum Arithu ***Kural 647***

சொலல்வல்லன் சோர்வுஇலன் அஞ்சான்
அவனை
இகல்வெல்லல் யார்க்கும் அரிது குறள் 647

"Behold the man who is eloquent of speech and knoweth neither confusion nor fear : it is impossible for anyone to beat him in debate"

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 honour 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)

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