



Hydel Bullet

A Monthly Publication Of the Kerala State Electricity Board Engineers' Association

Issue - 7

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July 2015

Pay Revision in KSEBL

The 10th pay commission constituted as per G.O. dated 30-11-2013 headed by Justice C N Ramachandran Nair submitted its report to the State Government on 13-7-2015 recommending a revision in the pay and perks of government employees. Accordingly the revised pay package of government employees will be implemented with retrospective effect from July 2014. The recommended pay hike ranges from ₹2,000 to ₹7,500 p.m.

Contd. to page 4





Felicitation given to Er. Bhuvanendra Prasad, Chief Engineer (Transmission South)
By Kollam Unit



Releasing of Power Scene by Kollam unit.



KSEB Engineers' Association Office Bearers - 2015 - 16

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The pay revision of employees and engineers in KSEB is due from August 2013 and July 2013 respectively . Though KSEB was corporatized w.e.f November 2013, unlike in many other States where the restructuring was accompanied by a handsome pay hike to its employees, no change in the terms and conditions of pay was implemented in KSEBL . During the tripartite discussion with regard to the corporatization of the KSEB, we had pointed out this and had demanded a revision in the pay and perks. The general consensus then arrived was that the pay revision discussion would be initiated soon after the submission of pay commission report for government employees. Now since the pay revision recommendations for the government employees has been evolved we demand that a pay revision committee may be constituted immediately in KSEBL to formulate the revision of pay package through discussions.

Over the years the power sector in the country has under gone many changes. The sector has become more complex with the enactment of Electricity Act 2003 and the regulatory regime. In the changed

scenario, the KSEBL employees have many challenging tasks unlike in the past. Rendering timely service, implementing government policies, completion of various projects etc. have a direct bearing on the nature of work of the employees. Everyone knows that the work nature, duties and responsibilities, service conditions and level of productivity of power sector are different from that of government. A focused approach with full operational knowledge is essential to perform and it is a task completion approach rather than time based approach. Engineers being the prime movers of this sector, it is the need of the hour to have an appropriate pay package for them. The employees working in generation shall be provided with lucrative allowances to attract employees to work in generation.

We request the management to initiate the process immediately for arriving an appropriate pay package to the employees in general and engineers, in particular keeping in view the prevailing pay package of engineers of the central PSUs which are in the same field.

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Letters to the Editor

കത്തുകൾ അയക്കേണ്ട വിലാസം

**Chief EditorHydel Bullet,
KSEB Engineers' Association
Panavila, Thiruvananthapuram - 01,
Phone : 0471 - 2330696
Email :hydelbulletin@gmail.com**



HANDLING ELECTRICITY:

COMMODITY Vs SERVICE AGAINST CARRIER AND CONTENT SEPARATION

Er. C. P. George

ELECTRICITY AS A COMMODITY

Is electricity to be treated as a public good with universal service Obligation of the State or it should be treated like a commodity and work on market based principles?

Until the evolution of Electricity Act 2003, the Electricity industry was traditionally considered under service sector. But with the evolution of better technology for measurement of electricity, measuring its demand with respect to time and frequency, the scenario has changed drastically. With the emergence of electricity Act 2003 and its sub ordinate regulations the electricity is legitimately accepted as a commodity and trading has been considered as a distinct activity.

The factors in handling of electricity as a commodity

1. Nature of Electricity:

- a. Lack of technology for bulk storage: Need Consumer as soon as produced!
- b. Only fresh product and production of electricity only on demand!!
- c. Requirement of Load Generation Balance
- d. Need Network to Transmit electricity to the consumer

Unless we overcome these restrictions through enough generation availability and enough transmission corridors availability in real time, the sale of electricity as a commodity may not succeed as envisaged.

2. Measurement of Quantity:

- a. For measurement of quantity of electricity, different parameters are available for measurement and need to decide up on the required parameters
- b. Measurement issues:
 - I. Need to decide upon the valuation on which quantity or quantities (kW / kVA / PF)?
 - II. We need to maintain the Load and Generation Balance (LGB) of the network/ Grid during 24x7. Again the network demand is time based and frequency dependent. Hence the quantity sold or transacted need to be measured with respect to time or 15 minutes time blocks as per the present practice.
 - III. Reliability and accuracy of measurement (range of % error permitted), type of recording and accounting also need to be considered for the measurement.
 - IV. Mandatory Regulations and Standards to be followed for Sale of Electricity as a commodity



3. Quality & Reliability issues while handling the electricity as a commodity

- a. The quality of electricity (Voltage limit, variation, Harmonics etc.) delivered to a consumer is very much depends on the quality of network.
- b. As such the network and network operator decides the quality & reliability of electricity delivered to a consumer.
- c. Thus the level of investment in the network decides the quality and reliability and same can be predefined based on the consumer requirement.
- d. Evolution of Mandatory Standards mandates maintenance of minimum quality and accordingly the minimum service cost can be defined for a basic network.
- e. Reliability very much depends on the investment in the network and hence the extent of reliability may be linked to the cost of service

As such, the quality and reliability very much depends on the quality of networks and investment in the network shall decide the quality and reliability of electricity supplied to the consumer.

4. Supply - Demand issue

- a. Large deficit on supply with respect to demand is a problem in transacting the electricity as a commodity because this will lead to the price escalation with no consideration on production cost.

- b. In India the scope for increase in electricity demand is too high due to prevailing very low per capita consumption. Thus the ever increasing demand necessitates close regulatory control mechanism to ensure reasonable price of electricity in the market.
- c. Requirement of heavy investment and lack of resources restricts the bridging of the Supply Demand gap in near future and this call for private participation in addition to the government investments.

5. Cost Issues

- a. Cost on production varies based on the fuel, type of plant, Plant load factor and many such factors.
- b. The transmission & distribution cost with T&D loss is decided by the location of the consumer, the time of consumption (peak- off peak) and seasons.
- c. *As such the cost of electricity as a commodity is decided by the cost of production and location of the consumer and time of consumption.*
- d. *The cost involved in the quality and reliability of electricity is decided by the network investment.*

6. Safety issues

while handling the electricity is one of the important aspect in transacting electricity to the consumer.

- a. Cost on safety to the employees shall be a factor in the quality and reliability of the network and need to be reflected in maintenance of a healthy network.





- b. Similarly, the cost on safety to the public is to be reflected in the network investment and maintenance.

CARRIER AND CONTENT SEPARATION

The effective utilisation of the available generating stations and resources in the country is the best way to ensure the cost of electricity to the minimum and make it affordable to the common man. With national grid in place, India with its varying regional demand can effectively use its generating stations and resources to its best use, if our regional transmission corridors and interstate transmission systems have enough power carrying capacity without congestion. The result of the de-licensed generation and the benefit of diversity in the country can be reaped only with the free flow of electricity to the consumers and licensees through the network. With the open access up to the transmission level, it is permitted and possible now for all the licensees and bulk consumers. All licensees including KSEBL is largely benefited from the open access provision in the Electricity Act. In order to extent these benefit to the consumers, Carrier - Content division is proposed in the Electricity Amendment Act. Accordingly the value of the content is decided based on the quantum of parameters (kWh/kVA), time of consumption, real time system frequency and location of the consumer. The generator is accountable for all these parameters and he is supposed to deliver the quantum according to the mutual agreement or real time arrangement.

But the quality of electricity and the reliability of supply cannot be decided by the generator.

The delivery of the electricity to the consumer normally involves a transmission network and a distribution network. According to the present open access regulation, by providing transmission charges, the electricity can be transported up to the distribution point, after taking in to the account of the transmission losses.

Now the point is **whether the distribution licensee & supplier are open enough to provide the necessary quality and reliability to the quantum of energy purchased by the consumer from a different supplier or directly from a generator?** Due to conflict of interest, it is natural to think of foul play unless the functions and accounts are separated even when the same operator owns the network and supply business. In the end, *for ensuring fair play, it is a genuine requirement to propose functional division of the network business and the supply business for easy and reliable transaction of electricity as a commodity.*

Conclusion

1. Carrier - Content separation is in tune with the transaction of electricity as a commodity and it increases the scope of electricity transaction as a commodity.
2. Carrier-Content separation shall ensure the accountability on quantity and quality of electricity transacted.
3. The generator or supplier shall be accountable for the quantity of supply.





It was an exciting day. Much awaited election results are to come with in an hour. Sam was in front of TV sipping his favourite scotch and smoking

favourite Rothmans. Wife Julie was bundling old newspapers in the store for disposal. Among the newspapers she spotted a very old one with a photo of a beautiful girl along with some news in box. The date showed this newspaper is 9 years old. They used to dispose old newspapers in every three months. May be this particular paper might have been used for wrapping some grocery items from the shop and left in the store after use. Sam's wife came out from the store holding the old newspaper. She was surprised by the matter and started to read to take my attention "Sam listen, there is an interest-

STOCKHOLM SYNDROME

Er. U.S. Ravindran (Rtd. E.E)

ing matter here. Natasha still loves the man who locked her as hostage for eight years. She was kidnapped at the age of ten on the way to her school. Now she is eighteen. She was in captivity in an underground room for eight years. The kidnapper was a gang and she was washing the car a few days ago and she escaped from captivity while the gang was attending a phone call behind. But she still loves the middle aged kidnapper. Natasha tells that the gang did not steal my childhood. "May be I think this kidnapping saved me from a lot of bad habits otherwise like smoking, using drugs or alcohol". The Psychologists

-
4. The network operator shall be accountable for the quality and reliability.
 5. Different levels of quality and reliability may be possible based on the level of consumer requirements and their affordability or willingness to pay the expense.
 6. Quality and Reliability shall be linked to the investment in the network and level of O & M expense allowed.
 7. Before implementing Carrier-Content separation, we need to ensure a perfect, automated distribution network management with real time measurement and accounting of electrical parameters.

This may be in tune with the regional and national grid management and electricity accounting mechanism.

8. As such, the proposal is for future and not feasible in Kerala network for the next 10 years. We need to concentrate now on T & D loss reduction and improving the quality and reliability of the system.

From the author:

This is a subjective technical analysis over the handling of electricity as a commodity and nothing to do with the advantages and disadvantages over the Carrier - Content separation.





Unit Activities

Thrissur

The Unit Meeting Started at 5:25 PM with Er. T A Kuriakose unit chairman on chair. He talked on various developments in KSEB Ltd, New director Board and transfer issues of Engineers. Minutes of last unit meeting was presented by Er. Shine. Er. N T job discussed on AGB and its grant success, distributing power scene to various members and settlement of transfer anomalies of unit. He informed the unit that we secured best unit for AGB 2015 and Er. Vinu Johnson on Best AE generation. Unit has elected new office bearers for next year 2015-16.

Sl. No	Post	Name	
1	Chairman	T R Suresh	
2	Vice Chairman	Raju K P	
3	Secretary	Shine Sebastian	
4	Treasurer	H Suresh	→

think that Natasha is infected by "Stockholm syndrome" a peculiar phenomena when the hostage loves and adjusts with the kidnapper. After reading the matter which happened in Vienna capital of Austria before 9 years Julie commented "How can a girl love a kidnapper that too a middle aged man?".

Initial doses of scotch had cleared Sam's inhibitions and he told Julie "Your father and mother kidnapped me showing their money, house and car, then I am a hostage and you are a kidnapper.. Before completing Sam's words excited wife Julie retorted "I cannot agree that, your father and mother kidnapped me-the daughter of wealthy parents showing your educational qualifications. Then you are the kidnapper and I am the hostage".

"Julie oh my dear wife I am not coming for an argument. However when ever kidnapper & hostage live together for some time both become addicted to some sort of Stockholm syndrome. Wife

start to love husbands' drinking and smoking habits. Husband will be forced to love wife's inflated faces and irritating words. That is both becomes slaves of many many dislikings and all disliking at last transforms into a favourite routine. Almost 90% of couples live this way. However darling we have lived together for thirty five years. Carry on with your job". I stopped talking and turned my attention to T.V. news.

"UDF win the election at Aruvikkara. LDF and BJP got defeated. Julie got enlightened " Sam this also is a Stockholm syndrome. Isn't it? Bar scandals, Solar scandals, Land scandals, still the public loves UDF !!.

"Yes Julie people are kidnapped for years. We are hostages. All these have become a routine of democracy. We can't live without scandals. First tolerate it, then enjoy it. Once a wise man has told". "If you cannot escape a rape, co-operate and enjoy it". Julie joined Sam on the sofa to hear more election news.





5	Joint secretary	N P Lusy
6		Biju R Moyalan
7	CEC members	Arun Kumar V K
8		Jithesh
9		Harish
10		Haneesh A S
11	Power Scene Editor	Bhagyalakshmi

Er. T A kuriakose welcomed all newly elected members and expressed his gratitude for Thrissur unit. Er. N T Job put forwarded plans for this years unit activities. Felicitation program for Er. Venugopal on his retirement as Director (Transmission) and Er. Kesavadas on his promotion to CE (IT), started with Er. TA kuriakose on Chair. Engineers shared their experience working with Er Venugopal and Er. Kesavadas and wished them all success. Er. Venugopal and Er. Kesavadas expressed their gratitude to the unit and KSEBEA. Er. Shine presented Vote of thanks and meeting concluded at 8:30 PM

Kozhikode

The new office bearers of Kozhikode unit for the year 2015-16 :

Position	Name	Official Address	CUG No.	Personal No.	E-mail ID
Chairman	K. Nandakumar	AEE, RITU, Kozhikode		9447229577	nandakumar.krishnakurup@gmail.com
Vice Chairman	P.T. Joseph	EE, Ele. Division, Iritty		9446008344 9895188694	ptjosephkkd9@gmail.com
Secretary	K. Santhosh	AEE, Sub Station Sub Division, Chevayur		9496010999 9656421182	santhoshkunilyil@rediffmail.com
Treasurer	Yedunadh	AE, Ele. Section, Pottammal		9496010822 9447637218	yadukakkattil@gmail.com
CEC Members					
1	Pramod P.V.	AEE, Sub Station Sub Division, Orkatteri		9496011048 8547402315	aee220kvssork@gmail.com
2	Ashraf T.K.	AE, Ele. Section Kunnamangalam		9496010718 9400500337	ashrafftckseb@gmail.com
3	Shameer N	MMSO, KHEP, KAKKAYAM, KOZHIKODE-673615		9496012195 9446868874	shameer.neroth@gmail.com

Kollam

The new office bearers of Kollam unit for the year 2015-16 :

Sl. No.	Name		Mob
1	Er. Shaji Thomas (EE)	Chairman	9446008269
2	Er. Beena Pious (EE)	Vice Chairman	9446008268
3	Er. Vishnu.B.S (AE)	Secretary	8943746705
4	Er. Varun.V.R (AE)	Treasurer	9497590053
5	Er. Jasmine (AE)	CEC member	9496022976
6	Er. Anil Kumar.G	CEC member	9446009155
7	Er. Dony.C.S	Building committee	9400300055
8	Er. Anil Kumar.G	Powerscene Editor	9446009155



Idukki

The new office bearers of Idukki unit for the year 2015-16 :

Detail of KSEB EA Idukki Unit Office bearers

Sl.No.	Name	Post	CUG	Personal
1	Noushad K.A.	Chairman	9446008454	7736602437
2	Rajasekhar Rao T.R.	Secretary	9496009421	9744987420
3	Santhosh Kumar M.V.	Treasure	9496009409	9744560967
4.	Shaji K. Mathew	Vice Chairman	9446008455	
5.	Aji Joiseph	Joint Secretary		9496009400
6.	Binoy R.	CEC Member	9496009424	9562979279
7.	Sajeev K.	CEC Member	9496009407	8547806365
8.	Nishanth B.	CEC Member	9496009411	9495214434

CONGRATULATIONS

ERNAKULAM UNIT HEARTLY WELCOMES NEW CHIEF ENGINEERS

Er Shaji NN, Chief Engineer (Transmission – System Operation), Kalamassery



Started the carrier as an Electrical Engineer in Distribution Transformer Company in 1984, then as a Testing & Quality Control Engineer in TELK Angamally.

Joined KSEB in March 1990 in Transmission Construction and then Station Engineer of Substation up to 1997. From 1997 to 2002 in Idukki Powerhouse as Maintenance AEE.

2002 to 2005 in PETARC as AEE (Faculty). 2005 to 2010 as EE O/o CE Generation. Promoted as DY CE Generation Circle Meencut in June 2010. From July 2010 to June 2015, Dy CE O/O CE Generation. Promoted as CE (Transmission) System

Operation in June 2015. Working as a Faculty at PETARC for Statutory Training, Generation, Transmission and Project Management.

Er. Susan Jacob, Chief Engineer (Thermal Projects), Kalamassery



Graduated from TKM College of Engineering, Kollam on 1985. Started Career in TELK, Angamally and after two years joined in KSEB on 1990 at Transmission and System Operation



FOURIER SERIES AND HARMONICS IN MUSIC AND ELECTRICITY

P.V. Pramod

Assistant Executive Engineer
220KV Substation, Orkatteri

1. INTRODUCTION

Jean Baptiste Joseph Fourier was born in Auxerre in north central France on March 21, 1768. By the age of nine both his father and mother had died. With the help and influence of his family friends, Fourier was admitted to a military school, where he showed talent in mathematics. France had a tradition of creating great scientists who also served their country in military. Fourier also wished to follow the tradition so as to become an Artillery officer. However as he belonged to lower social class (his father was a trailer), Fourier was only able to get a mathematics lectureship in the military school. Even then he had greatly involved in public life, by actively supporting the French revolution in 1789. Later Fourier was rewarded for his activities and in 1795 he was offered a professorship at the prestigious Ecole Poly technique in Paris where great Mathematicians Lagrange and Monge were also teaching.

In 1798 the great emperor Napoleon launched his military campaign in Egypt. Napoleon was a man of broad interests in the arts and science, who asked prominent scholars to join him and among them were Monge and Fourier. Fourier was appointed governor of southern Egypt in that capacity, he organised workshops of the French occupation forces. Following the defeat of the French by the British in 1801, he returned to France and became the prefect (administrative officer) of the district of the Grenoble. Among his administrative duties was the supervision of road construction and drainage projects, which he executed with great ability. Moreover he was also appointed secretary of the Institute-de-Egypt and in 1809 completed a major work on ancient Egypt-*Preface Historique*.

At the very time Fourier was exercising his administrative duties, he was deeply involved in mathematical research also. He worked in two unrelated fields- theory of



equations and mathematical physics. He found a new proof of roots of a polynomial. He had also started writing a book on linear programming. He also pioneered dimensional analysis - the study of relations among physical quantities based on their dimensions.

But it is in the mathematical physics, the Fourier made his greatest mark. He was interested in the manner in which heat flows from a region of high temperature to one of lower temperature. Newton had already studied this aspect who found that the rate of cooling of an object is proportional to the difference between its temperature and that of its surroundings. Newton's law of cooling however governs only the 'temporal' rate of change of temperature, not its 'spatial rate of change or gradient. This latter quantity depends on many factors-the heat conductivity of the object; its geometric shape and the initial temperature distribution on its boundary. Solving this problem had required the analytic tools of the continuum, in particular the partial differential equations. Fourier showed that to solve such an equation one must express the initial temperature distribution as a sum of infinitely many sine and cosine terms- i.e. a trigonometric series which was later known popularly as Fourier series. Fourier began work on this subject on 1807, which became his major work leading to the publication -"Analytical theory of heat" in 1822. This became a model for some of the great nineteenth century treatises on mathematical physics.

In his work Fourier was guided not only by his sound grasp of physical principles but also by purely mathematical considerations. His motto was -"Profound study of nature is the most fertile source of mathematical discoveries."

2. FOURIER THEOREM

According to Fourier theorem, any single valued "complex periodic function or wave" can be split into a series of sinusoidal waves, the first of which has the same frequency (termed as fundamental frequency) and the remaining waves have frequencies double, triple, 4th, 5th ...multiple of fundamental frequency(termed as harmonics). In fact this was a wonderful concept in mathematical physics which later found greater application in science and all branches of engineering. Music and electrical engineering are two areas where Fourier theorem and Fourier analysis being used extensively.

The basic idea behind Fourier theorem is simple. We know that the function $\cos x$ and $\sin x$ each have period 2π , the function $\cos 2x$ and $\sin 2x$ have period $2\pi/2 = \pi$ and in



general the functions $\cos nx$, & $\sin nx$ have period $2\pi/n$. But, if we form any 'linear combination' of these functions i.e. multiply each by a constant and add the result-the resulting function still has the period 2π . This idea has been shown graphically in Fig 1 using two waves $\sin x$, $\frac{1}{2} \sin 2x$ and their sum.

Mathematically we can interrupt this concept. Let $f(x)$ be a periodic function with period 2π - i.e. $f(x+2\pi)=f(x)$ for all x in its domains. Now we can write $f(x)$ as the finite sum,

$$f(x) = S_n(x) = a_0 + a_1 \cos x + a_2 \cos 2x + a_3 \cos 3x + \dots \dots \dots a_n \cos nx + b_1 \sin x + b_2 \sin 2x + b_3 \sin 3x + \dots \dots \dots b_n \sin nx \quad (1)$$

The expression (1) can be written in concise form as

$$f(x) = S_n(x) = a_0 + \sum_{m=1}^n (a_m \cos mx + b_m \sin mx) \quad (2)$$

where the coefficients a_0, a_m, b_m are real numbers.

Since $S_n(x)$ is the sum of terms of the form $\cos mx$, & $\sin mx$ for $m=1, 2, 3, \dots$ it is a periodic function of x with period 2π ; the nature and shape of this function, of course, depend on the coefficients a_0, a_m, b_m etc and n .

The coefficients a_0, a_m, b_m etc are given by,

$$a_0 = \frac{1}{2\pi} \int_{-\pi}^{\pi} f(x) dx \quad (3)$$

$$a_m = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \cos mx dx \quad (4)$$

$$b_m = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \sin mx dx \quad (5)$$

These coefficients are known as Fourier coefficients and the equations are known as Euler's formulas.

Now let us apply Fourier theorem to a simple periodic function – a saw tooth waveform shown in Fig 2. Mathematically it is represented as

$$f(x) = x ; -\pi < x < \pi \quad (6)$$

(Figures are shown in page No. 18 & 19)



The function has a period 2π and is periodic in the interval $-\pi < x < \pi$.

Now the Fourier coefficients are given by Euler's formula as,

$$a_0 = 0 \quad (7)$$

$$a_m = 0 \quad (8)$$

$$b_m = \frac{2(-1)^{m+1}}{m} \quad (9)$$

$$\text{ie } b_1 = 2, b_2 = -1, b_3 = \frac{2}{3}, b_4 = -\frac{1}{2}$$

We thus have

$$\begin{aligned} f(x) &= 2 \sin x - \sin 2x + \frac{2}{3} \sin 3x - \frac{1}{2} \sin 4x \\ &= 2 \left(\frac{\sin x}{1} - \frac{\sin 2x}{2} + \frac{\sin 3x}{3} - \frac{\sin 4x}{4} + \dots \right) \end{aligned} \quad (10)$$

Fig 3 shows the first 4 partial sums of this series. It can be seen that as the value of m increases i.e. more harmonics are added, the resultant waveform approaches the saw-tooth waveform.

Here we have formulated the Fourier theorem for function with period 2π . But it can also be adjusted to functions with an arbitrary period T by the substitution $x' = (2\pi/T)x$. It then becomes more convenient to formulate the theorem in terms of the angular frequency ω defined as $\omega = 2\pi/T$. Fourier theorem then says that any periodic function can be written as sum of infinitely many sine and cosine terms whose angular frequencies are $\omega, 2\omega, 3\omega$ and so on. The lowest of these frequencies i.e. ω is the fundamental frequency and its higher multiples are the harmonics.

(Figures are shown in page No. 18 & 19)



3. FOURIER COEFFICIENTS AND WAVE FORM SYMMETRY

We have seen that the Fourier series of a saw tooth wave shown in Fig. 2 consists only sine terms –i.e.its a_0 coefficient and a_m coefficients are zero. Note that this saw-tooth wave is symmetric about the origin. If the same saw-tooth wave is located above x axis- i.e.it is not having negative half cycles, the Fourier series will contain the constant term a_0 and the sine terms. The Fourier series of some other waveforms will have only cosine terms. Also, sometimes both sine and cosine terms will be seen, but only odd harmonics are present. This is related to the types of symmetry exhibited by the waveforms. Knowledge of symmetry results in reduced calculations of Fourier coefficients -i.e.some coefficients need not be calculated as their value will be zero according to waveform symmetry.

Case 1. Waveform symmetrical about the origin

Fig 4 shows waveforms which are symmetrical about the origin. Such waveform represent odd function of x . A function $f(x)$ is said to be odd if $f(-x) = -f(x)$. Examples of odd functions are $\sin x$, $\tan x$, x , x^3 etc.

If the waveform is odd, the a_0 , a_m coefficients are zero so that the Fourier series contain only sine terms. Note that saw-tooth waveform in Fig. 2 consists only sine terms. Thus for odd functions we need not calculate 'a' coefficients.

Case 2. Waveform symmetrical about y axis.

Fig.5 shows waveforms which are symmetrical about y axis. Such waveform represent even functions of x . A function $f(x)$ is said to be even if $f(-x) = f(x)$. Examples are $\cos x$, $\sec x$, x^2 etc.

If the waveform is even, the ' b ' coefficients become zero, so that the Fourier series will contain only cosine terms.

Case 3. Waveforms with half wave symmetry.

Fig.6 shows the waveforms with half wave symmetry. A periodic function $f(x)$ is said to have half wave symmetry if $-f\left(x \pm \frac{T}{2}\right) = f(x)$ where T is the period.

If the waveform has half wave symmetry, only odd harmonics are present in the series. This series will contain both sine and cosine terms unless the function is odd or even. In all cases a_m and b_m are equal to zero for $n=2, 4, 6$ for any waveform with half wave symmetry.

(Figures are shown in page No. 18 & 19)



Case 4. Waveforms with non-zero average value.

If a wave form has a non-zero average value, the Fourier series will contain the constant coefficient a_0 in addition to other terms. Normally waveforms situated above x axis will have non-zero average values. Fig 7 shows waveforms with non-zero average values.

We have seen the dependence of waveforms symmetry and Fourier coefficient. Now let us see the mathematics behind it. One of the properties of definite integrals says that

$$\int_{-T}^T f(x) dx = 0 \text{ when } f(x) \text{ is odd} \quad (11)$$

$$= 2 \int_0^T f(x) dx \text{ when } f(x) \text{ is even} \quad (12)$$

Case 1 : $f(x)$ is odd

Now
$$a_0 = \frac{1}{2\pi} \int_{-\pi}^{\pi} f(x) dx = 0 \quad (13)$$

Then the product $f(x) \cos mx$ will also be odd since $\cos mx$ is even. Hence

$$a_m = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \cos mx dx = 0 \quad (14)$$

Also the product $f(x) \sin mx$ is even since $\sin mx$ is odd. Hence

$$b_m = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x) \sin mx dx = \frac{2}{\pi} \int_0^{\pi} f(x) \sin mx dx \quad (15)$$

Case 2 : $f(x)$ is even

Now,
$$a_0 = \frac{1}{2\pi} \int_{-\pi}^{\pi} f(x) dx = \frac{1}{\pi} \int_0^{\pi} f(x) dx \quad (16)$$

Since the product $f(x) \cos mx$ is even we get

$$a_m = \frac{2}{\pi} \int_0^{\pi} f(x) \cos mx dx \quad (17)$$

But $f(x) \sin mx$ is odd so that $b_m = 0 \quad (18)$

(Figures are shown in page No. 18 & 19) *Shall be continued.....*

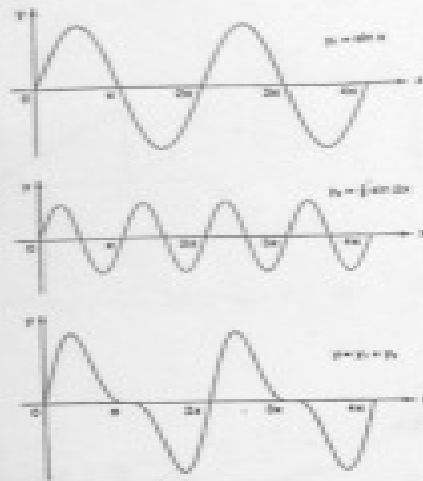


Fig-1 Graphs of $\sin x$, $\frac{1}{2} \sin 2x$ and their sum

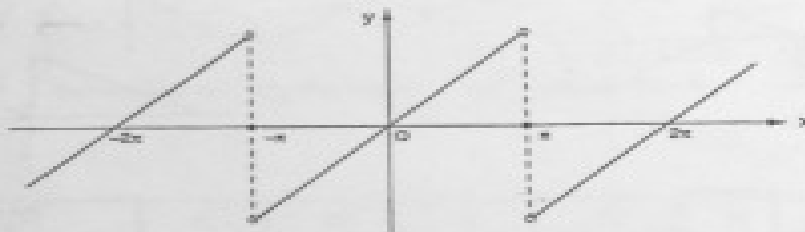


FIG. 2. Graph of the periodic function $f(x) = x$, $-\pi < x < \pi$.

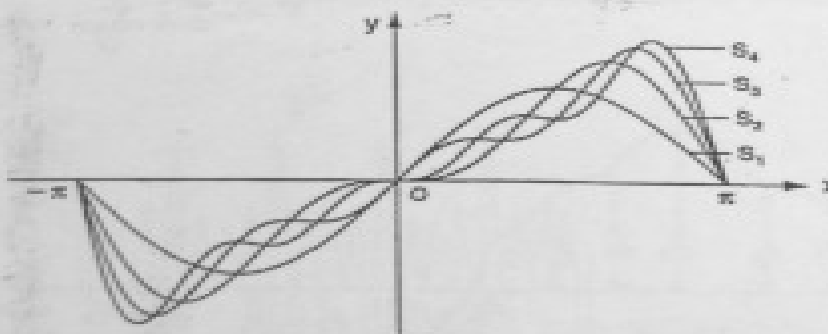


FIG. 3. First four partial sums of the Fourier expansion of $f(x) = x$, $-\pi < x < \pi$.

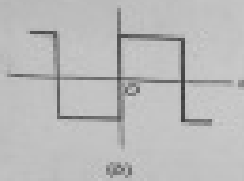
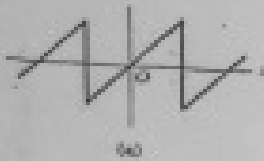


Fig. 4 Waveforms symmetrical about the origin (odd functions)

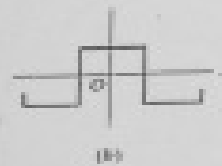
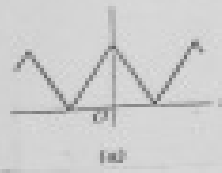


Fig. 5 Waveforms symmetrical about the y-axis (even functions)

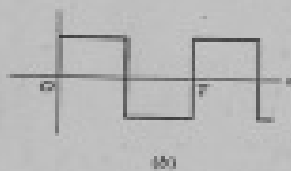
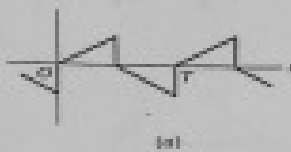


Fig. 6 Waveforms with half wave symmetry

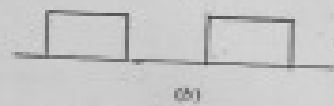
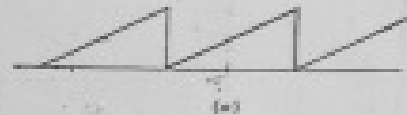


Fig. 7 Waveforms with non-zero average value

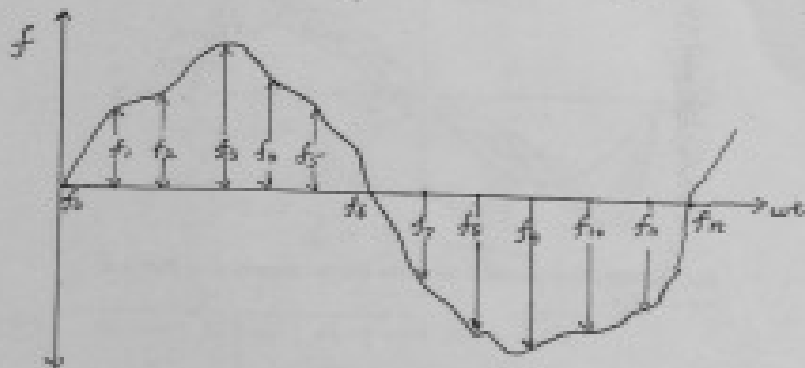


Fig. 8 Complex waveform divided into equally spaced ordinates



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KSEBEA at its CEC meeting held at Kasargose on 25-07-2015 has elected the new subcommittee for the year 2015 -16

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ഒരു ഗ്രീൻ ദൂരന്തം

Er. രാജൻ വി.

ആയിരത്തിത്തൊള്ളായിരത്തി തൊണ്ണൂറുകളിൽ തുടങ്ങിയ ആഗോളവൽക്കരണമെന്ന സാമ്പത്തിക ഉദാരവൽക്കരണവും സ്വകാര്യവൽക്കരണവും ലോകം മുഴുവൻ ഒരു പ്രത്യേക ജീവിതശൈലി തന്നെ ഉണ്ടാക്കി. അതിന്റെ ഫലമായി സംഘടിത തൊഴിലാളികളുടെയും ജീവനക്കാരുടെയും ശമ്പളവും പെൻഷനും അതിനനുസരിച്ച് അസംഘടിത മേഖലയിലെ കുലിയും വേതനവും വർദ്ധിച്ചു. ഇതൊരു ഉപഭോഗ സംസ്കാരം ലോകം മുഴുവൻ നടപ്പിലാക്കി. പണ്ടൊക്കെ നമ്മൾ യൂറോപ്പിനെയാണ് വിശേഷിച്ചും അമേരിക്കയെയാണ് ഇക്കാര്യത്തിൽ പ്രധാനമായും പറഞ്ഞിരുന്നത്. പക്ഷേ ഇപ്പോൾ ലോകം മുഴുവൻ ഈ പ്രതിഭാസമാണ്. ഇപ്പോൾ സർക്കാരുകൾ തന്നെ ജനത്തെ കൂടുതൽ ഉപഭോഗം നടത്താൻ പ്രേരിപ്പിക്കുകയാണ്. ഇതിന് ഇടതു - വലത് തത്വശാസ്ത്ര പ്രതിബന്ധമൊന്നുമില്ല. നമ്മുടെ സർക്കാരുകൾ തന്നെ എല്ലാ വർഷവും വ്യാപാര മേളകൾ വലിയ സമ്മാനപദ്ധതികളോടെ തന്നെ നടത്താറുണ്ടല്ലോ. ജനത്തിന്റെ കൈയിൽ നേരത്തെ പറഞ്ഞ രീതിയിൽ എത്തുന്ന പണം ഈ പ്രതിഭാസത്തെ നല്ലരീതിയിൽ പ്രോത്സാഹിപ്പിക്കുകയും ചെയ്യും. അങ്ങനെ നമ്മുടെ വീടുകൾ ആവശ്യമുള്ളതും ഇല്ലാത്തതുമായ സാധനങ്ങളെക്കൊണ്ട് നിറഞ്ഞു. പഴയ സാധനങ്ങളൊന്നും ആർക്കും വേണ്ടാത്ത നിലയിലായി. ഗൃഹോപകരണങ്ങൾ പൊതുവേ വർഷംതോറും നവീകരിക്കപ്പെടുന്നുണ്ട്. അത് വാങ്ങിക്കഴിയുമ്പോൾ ഉപയോഗത്തിലിരിക്കുന്ന ഉപകരണം ആവശ്യമില്ലാത്ത വസ്തുവായി മാറുന്നു. ഈ സാഹചര്യം ഏതാണ്ടെല്ലാ വസ്തുക്കളിലും കാണാം. രണ്ടായിരത്തിപന്ത്രണ്ടാമാണ്ടൊക്കെ ആയപ്പോൾ ഈ ജീവിതരീതി ഒരു നിലനില്പുള്ള പ്രത്യയശാസ്ത്രമല്ലായെന്ന തിരിച്ചറിവ് പലർക്കും

ഉണ്ടായി. പക്ഷേ അപ്പോഴേക്കും ഒരു തിരിച്ചുപോക്ക് അത്ര എളുപ്പമല്ലാത്ത തലത്തിലേക്ക് കാര്യങ്ങൾ എത്തിയിരുന്നു. അങ്ങനെ അപ്രിയമായ തീരുമാനങ്ങളെടുക്കാൻ ഇച്ഛാശക്തിയില്ലാത്ത സർക്കാരുകൾ, തെളിയിച്ച വഴിയെപോകുന്നില്ലെങ്കിൽ പോയ വഴിയെ തെളിയിക്കാമെന്ന നയമാണ് സാധാരണ പാലിക്കുന്നത്. അത് കാരണം സർക്കാർ റവന്യൂ വരുമാനം മുഴുവൻ ശമ്പള - വേതന - പെൻഷൻ സാമൂഹിക ക്ഷേമ പദ്ധതികൾക്ക് തന്നെ തികയുന്നില്ല; അപ്പോൾ പിന്നെ വികസന പദ്ധതികളുടെ കാര്യം പറയണ്ടല്ലോ. അതുകൊണ്ട് തന്നെ നാട്ടിൽ തൊഴിൽ ഉല്പാദനം വളരെക്കുറവാണ്, പ്രധാനമായും പൊതുമേഖലയിൽ. പിന്നെ കുറെ സ്വകാര്യ നിക്ഷേപകങ്ങൾ മാത്രമാണ് ഇവിടെ നടക്കുന്നത്. അക്കൂട്ടത്തിൽ നമ്മുടെ നാട്ടിൽ അധികമായി നടക്കുന്നത് കുറെ നിർമ്മാണ പ്രവർത്തനങ്ങളാണ്, വിശേഷിച്ചും ഗൃഹനിർമ്മാണം. അവിടെ നിർമ്മാണ സമയം കഴിഞ്ഞാൽ പിന്നെ തൊഴിലവസരങ്ങളൊന്നും ഉണ്ടാകില്ലല്ലോ. ഇതൊക്കെ തന്നെയാണ് അല്ലറചില്ലറ വ്യത്യാസത്തോടെ, എല്ലാ സ്ഥലങ്ങളിലും നടക്കുന്നത്. അതുകൊണ്ട് തന്നെ ഒരു ഉദാസീന മനോഭാവം നമ്മുടെ മുഖമുദ്രയുമായി. എങ്ങനെയും പണം ഉണ്ടാക്കി ജീവിതം ആസ്വദിക്കുക, മറ്റൊന്നിലും ഒരു താല്പര്യവും കാണിയ്ക്കാതിരിക്കുക.

ഈയൊരു പശ്ചാത്തലത്തിൽ വേണം ഗ്രീൻ ദൂരന്തത്തെക്കുറിച്ച് ചർച്ച ചെയ്യാൻ. ആഗോളവൽക്കരണത്തിന് മുന്നെതന്നെ ഗ്രീൻ യൂറോപ്യൻ യൂണിയനിൽ അംഗമായിരുന്നു. അതിലെ പ്രധാന രാജ്യമായ ജർമ്മനിയിൽ നിന്നും യൂറോപ്യൻ കേന്ദ്രബാങ്കിൽ നിന്നും ഒ.എം.എഫിൽ നിന്നുമാണ് ഗ്രീൻ ഏതാണ്ട് ഇരുപത്തിരണ്ട് ലക്ഷം കോടി രൂപ ലോൺ എടുത്തിരുന്നത്. അതിന്റെ ഒരു തിരിച്ചടവ് അവസാനം നീട്ടി നല്കിയ തീയതിയും കഴിഞ്ഞ മാസം പാലിക്കപ്പെട്ടില്ല. നേരത്തെ പറഞ്ഞ ജീവിത രീതി കാരണം ഗവൺമെന്റ് ഖജനാവു കാലിയാണ്. അപ്പോൾ ഗ്രീൻ





വീണ്ടും ലോൺ ആവശ്യപ്പെട്ടു. അങ്ങനെ നേരത്തെ സൂചിപ്പിച്ച ത്രിമൂർത്തികൾ കർശനമായ നിബന്ധനകളോടെ വീണ്ടും ലോൺ കൊടുക്കാൻ തയ്യാറായി. അപ്പോൾ അവിടത്തെ ഇടത് ചായ്വുള്ള സർക്കാർ ശക്തമായി എതിർത്തു. അവസാനം സർക്കാർ ഹിത പരിശോധന നടത്താൻ തീരുമാനിച്ചു. മാധ്യമ റിപ്പോർട്ടുകൾ പ്രകാരം ചെറുഭൂരിപക്ഷത്തിന് ലോൺ നിബന്ധനകൾ അംഗീകരിക്കാമെന്നുള്ള തീരുമാനം ഉണ്ടാകുമെന്നാണ് മനസിലാക്കുന്നത്. അവസാനം ഫലം വന്നപ്പോൾ നിബന്ധനകൾ അംഗീകരിക്കേണ്ടതെന്ന് 61 % പേർ ആവശ്യപ്പെടുകയെന്നാണ് കണ്ടത്. അത് കഴിഞ്ഞ് ഒരാഴ്ച നടന്ന നീണ്ട ചർച്ചകൾക്ക് ശേഷം നേരത്തെ നിഷ്കർച്ചയിനെക്കാളും കഠിനമായ നിബന്ധനകൾ അംഗീകരിച്ച് ലോൺ എടുക്കാൻ ഗ്രീസ് തീരുമാനിച്ചു. അതിന്റെ നടപടി ക്രമങ്ങളെല്ലാം പൂർത്തീകരിക്കുകയും ചെയ്തു. പ്രധാനമായ നിബന്ധനകൾ; ശമ്പളവും പെൻഷനും കുറയ്ക്കണം, നികുതികൾ കൂട്ടണം, പെൻഷൻ പ്രായം കൂട്ടണം, ദീപുകൾക്കുള്ള പ്രത്യേക സഹായങ്ങൾ കുറയ്ക്കണം, തൊഴിൽ നിയമങ്ങൾ പരിഷ്കരിക്കണം എന്നൊക്കെയാണ്. ഇതിന്റെയൊക്കെ അനന്തരഫലം ഉപഭോഗം കുറയ്ക്കുകയെന്നാണ്, അതിന്റെ ഫലമായി ഉല്പാദനം കുറയും, അത് മറ്റ് പ്രശ്നങ്ങളിലേക്ക് നയിച്ചേക്കാം.

ഗ്രീസെന്ന് പറഞ്ഞാൽ സോക്രട്ടീസിന്റെ, ഹിപ്പോക്രാറ്റിന്റെ, ഹോമറിന്റെയൊക്കെ നാടാണ്. കൂടാതെ ജനാധിപത്യത്തിന്റെ ഈറ്റില്ലം. കലാ - സാംസ്കാരിക, കായിക വിനോദ മേഖല (ഒളിമ്പിക്സ്) കളിൽ വളരെ ഉയർന്ന നിലവാരമുള്ള രാജ്യമായിരുന്നു. അവിടെയാണ് ഈ ഗതികേട് സംഭവിച്ചതെന്നുള്ളതാണ് ശ്രദ്ധിക്കേണ്ട കാര്യം. ഏതാണ്ട് അതുപോലുള്ള സ്വാഭാവികമായ ഒരു സമൂഹമായിരുന്നല്ലോ നമ്മുടെതും. അതുകൊണ്ട് തന്നെ ഈ ഗ്രീസ് ദുരന്തത്തിൽ നിന്ന് നമുക്കും പലതും പഠിക്കാനുണ്ട്. കഴിഞ്ഞ ദശകത്തിലെ സംഭവവികാസങ്ങൾ വിശകലനം ചെയ്താൽ

ധാരാളം സാമ്യത നമ്മുടെ ജീവിത രീതികളിൽ കാണാം. ആഗോള വല്ക്കരണം ഇന്നൊരു യാഥാർത്ഥ്യമാണ്. അതിനെ തങ്ങളുടെ നന്മക്കായി പ്രയോജനപ്പെടുത്താനാണ് രാജ്യങ്ങൾ ശ്രമിക്കേണ്ടത്. അതിന് പകരം മടിപിടിച്ച ഒരു ധാരാളിത്ത ജീവിത രീതിയിലേക്കുള്ള കുറുക്ക് വഴി ആക്കിയാൽ ഫലം വലിയ ദുരന്തമായിരിക്കും.

നമ്മുടെ സർക്കാരുകളും അപ്രിയ തീരുമാനങ്ങൾ എടുക്കാൻ വൈമുഖ്യമാണ് കാണിക്കുന്നത്. അതുകൊണ്ട് ജനക്ഷേമകരമായ തീരുമാനങ്ങൾ ഒന്നും നടപ്പിലാക്കാറില്ല. നില്ക്കക്കള്ളി ഇല്ലാതാകുമ്പോൾ സർവ്വകക്ഷി യോഗമെന്നൊക്കെ നാടകം നടത്തും, ഒരു ദിവസം യോഗം കൂടി ദേശീയ പാത 30 മീറ്റർ മതിയെന്ന് തീരുമാനിക്കും, ഒരു മാസം കഴിഞ്ഞ് അടുത്ത യോഗംകൂടി 45 മീറ്റർ എന്ന് തീരുമാനിക്കും. അതുപോലെ തെരുവുപട്ടി പ്രശ്നം, മാലിന്യ സംസ്കരണം, പുതിയ പദ്ധതികൾ ഇതിലൊക്കെ ഈ തമാശ തന്നെയാണ് നമ്മൾ നടത്തുന്നത്. എന്തെങ്കിലും ക്രിയാത്മകമായി ചെയ്യണമെന്ന് സർക്കാരിനും ജനങ്ങൾക്കും ഒരു താല്പര്യവുമില്ല. മെയ്യന്മാരെ സുഖിച്ച് ജീവിക്കുക, അതിനായി സർക്കാരും ജനങ്ങളും കടമെടുക്കുകയാണ്.

സംസ്ഥാനത്തിപ്പോൾ അടുത്ത ശമ്പള പരിഷ്കരണത്തിന്റെ സമയമാണല്ലോ. അതിന്റെ അടിസ്ഥാന രേഖയായ കമ്മീഷൻ റിപ്പോർട്ട് സർക്കാരിന് ലഭിച്ചു. ഇപ്പോൾ നടക്കുന്ന അഞ്ച് വർഷത്തിലെ പരിഷ്കരണം പത്ത് വർഷമാക്കണമെന്നും പെൻഷൻ പ്രായം 58 ആക്കണമെന്നാണ് പ്രധാന നിർദ്ദേശങ്ങൾ, കൂടാതെ ശമ്പള വർദ്ധനയും സർക്കാരിന് 5000 കോടിയോളം ബാധ്യതയെന്ന് കമ്മീഷനും 1000 കോടിയോളമെന്ന് ധനകമ്മീഷനും പറയുന്നു. ഈ പ്രശ്നങ്ങളൊക്കെതന്നെയാണ് ഗ്രീസും അനുഭവിച്ചത്. നേരത്തെ പല പ്രാവശ്യം പറഞ്ഞതുപോലെ ചെലവ് ചുരുക്കലിൽക്കൂടി മാത്രമേ നമുക്ക് രക്ഷപ്പെടാൻ സാധിക്കൂ. സാമ്പത്തിക വിദഗ്ദ്ധരൊക്കെ പലതും





മോഹ ഭഗവത

Er. എച്ച്. പാൽരാജ്

ഗോപൻ സത്യസന്ധനാണ്. മാത്രമല്ല കോപിഷ്ഠനാണെന്നും പറയാം. ജോലിയിൽ നിന്നു വിരമിക്കുന്നതിന് മുമ്പ് തന്റെ മകന്റെയും, മകളുടെയും വിവാഹം നടത്തി പിിച്ചു. ഹേമാ ഭാര്യയാണ്. ഇവരുടെ ദാമ്പത്യ ജീവിതത്തിനെ കണ്ട് ചിലർ അസൂയപ്പെട്ടു.

എതിർവശത്ത് താമസിക്കുന്ന ദിനേശിന്റെ മകൾ രഞ്ജിനിക്കു ഗോപൻ ട്യൂഷൻ പഠിപ്പിക്കും. സാർ എന്ന് വിളിക്കുന്നതിനു പകരം അങ്കിൾ എന്ന് അവൾ വിളിക്കും.

വെറുതേ നോക്കി കൊണ്ടിരുന്നാൽ മതിയോ ? നാളെ ഞാൻ പഠിപ്പിച്ചതൊക്കെ കാണാപ്പാമായി തീരണം എന്ന് ആജ്ഞാ പിിച്ചു. എന്ത് ചെയ്യണമെന്ന് അറിയാതെ അങ്കിളിനെ പതിവ് പോലെ നോക്കിക്കൊണ്ടി രുന്നു രഞ്ജിനി.

എന്താ! രഞ്ജിനി ഞാൻ പറയുന്നതൊ ക്കെ മനസ്സിലായോ എന്നു വീണ്ടും ചോദിച്ചു.

ഉവ്വ് എന്ന് പറഞ്ഞു പുസ്തകത്തിനെ കൈ യിൽ എടുത്തു അവൾ പുറത്തുപോയി.

ഇതുവരെ അങ്കിൾ എന്റെടത്ത് കോപിച്ചിട്ടല്ല, ഇന്ന് എന്തുകൊണ്ട് ഇങ്ങനെ സംഭവിച്ചു എന്നു സ്വയം ചോദിച്ചു കൊണ്ടു അവൾ കട്ടിലിൽ തല ചാഞ്ഞു.

ആജ്ഞ നിറവേറ്റാമെന്ന. വൈരാഗ്യ ത്തിൽ പഠിച്ചതൊക്കെ കാണാപ്പാമാക്കി അടുത്ത ദിവസം അങ്കിളിന്റെ അടുത്ത് പോയി.

എന്താ രഞ്ജിനി പറഞ്ഞപ്രകാരം പാഠങ്ങൾ ഒക്കെ പഠിച്ചോ എന്ന് ഗോപൻ ചോദിച്ചു.

അതെ അങ്കിൾ എല്ലാം നല്ലപോലെ പഠിച്ചു.

പരീക്ഷ അടുത്ത്, ദിവസങ്ങൾ കഴിയു ന്തോറും രഞ്ജിനി ഉണ്ണാറില്ല, ഉറങ്ങുന്നില്ല. അങ്കിൾ ചോദിച്ച ചോദ്യങ്ങൾക്കു എല്ലാം ഒറ്റ മറുപടി, ഒന്നു മുളി.

രഞ്ജിനിയുടെ ഈ മാറ്റങ്ങളെ കണ്ട ഗോപൻ മാതാപിതാവിനോടു അറിയിച്ചു. ഒരു പക്ഷെ പരീക്ഷ പേടിയായിരിക്കാം. എന്നു തന്റെ മനസ്സിൽ വിചാരിച്ചിട്ട് പുറത്തുപോയി.

രഞ്ജിനിയുടെ മാറ്റത്തിനെ കണ്ട മാതാപിതാക്കൾക്ക് ഒന്നും മനസ്സിലായില്ല.

അവളുടെ മനസ്സിൽ എന്താണുളളത് എന്നറിയാൻ അവർ തീരുമാനിച്ചു.

“മോളേ രഞ്ജിനി നിന്റെ മനസ്സിൽ എന്താണ്. അത് നീ തുറന്നു പറഞ്ഞാൽ തന്നെ ഞങ്ങൾക്കു അറിയാം പറു. പക്ഷേ മോളേ എന്ത് പറ്റി എന്നു വാത്സല്യത്തോടെ അച്ഛൻ ചോദിച്ചു.



അവരുടെ രാഷ്ട്രീയ വിശ്വാസത്തിനനുസരിച്ച് പറയും, ഗ്രീസിലും അതൊക്കെ തന്നെയാണ് നടക്കുന്നത്. അതിന്റെ തിക്തഫലം ഇന്നവര റിയുന്നു. ആ ഒരു തലത്തിൽ ഇപ്പോഴും നമ്മൾ എത്തിയിട്ടില്ല. ഇന്ത്യാമാഹാരാജ്യ ത്തിന്റെ ഭാഗമാക്കുന്നതുകൊണ്ട് കുറച്ച് നാളു കൾകൂടി പിടിച്ചുനില്ക്കാൻ സാധിച്ചേക്കും. പക്ഷേ അന്തിമവിധിയിൽ നിന്ന് രക്ഷപ്പെടാൻ

സാധിക്കില്ല. കാരണം നമ്മളിന്ന് പാലിക്കുന്ന നീതിശാസ്ത്രം നിലനില്ക്കുന്നതല്ല. അത് കൊണ്ട് തന്നെ അതിനെ ഇന്നറിയിപ്പെടുന്ന സാമ്പത്തിക തത്വങ്ങൾ കൊണ്ട് നിയന്ത്രി ക്കാൻ പ്രയാസമാണ്. അപ്പോൾ നമ്മുടെ നാടൻ പ്രയോഗമായ ചെലവ് ചുരുക്കൽ ധൈര്യമായി പരീക്ഷിക്കാമല്ലോ.





ഒന്നുമില്ല അച്ചാ എന്നു പറഞ്ഞു ഒഴിഞ്ഞുമാറി അവൾ.

വിവാഹ പ്രായമായ മകൾക്ക് നല്ല ഒരു വരനെ അന്വേഷിച്ചു വിവാഹം കഴിപ്പിക്കാം എന്നു വിചാരിച്ചു. കോളേജിൽ നിന്നു തിരിച്ചു വന്ന രഞ്ജിനിയോടു കാര്യങ്ങളൊക്കെ അറിയിച്ചു. രഞ്ജിനിയുടെ മുഖം വല്ലാതെ വാടി ! എനിക്ക് ഇപ്പോൾ വിവാഹം വേണ്ടെന്നു പറഞ്ഞു അവൾ മുറിയിലേയ്ക്ക് പോയി. പതിവ് പോലെ ഊണ് കഴിക്കാൻ വന്നില്ല. അവൾക്ക് ഇപ്പോൾ താല്പര്യമില്ലെന്നു തോന്നുന്നു. പിന്നെ ആലോചിക്കാമെന്നു വിട്ടു.

പതിവായിപോലെ രാവിലെ എഴുന്നേൽക്കാറുള്ള രഞ്ജിനി അന്നു സമയം എട്ടു കഴിഞ്ഞിട്ടും ഉണർന്നില്ല. അമ്മ അവളെ തട്ടി ഉണർത്തി.

എഴുന്നേറ്റു രഞ്ജിനി കരഞ്ഞുകൊണ്ടിരുന്നു. തുടർന്നുള്ള ദിവസങ്ങളിൽ അവളിൽ നിന്നും പല മാറ്റങ്ങൾ കണ്ട മാതാപിതാക്കൾ അവളെ ഒരു മനഃശാസ്ത്ര ഡോക്ടറെ കാണാൻ കൊണ്ടുപോയി.

ഡോക്ടർ ചോദിച്ച ചോദ്യങ്ങൾക്ക് തക്കതായ മറുപടി നൽകിയില്ല അവൾ. നിന്റെ മനസ്സിൽ എന്താണ് വിചാരിച്ചുകൊണ്ടിരിക്കുന്നത്. നിന്റെ അച്ചനോട് പറഞ്ഞ് അതു സാധിച്ചുതരാൻ ശ്രമിക്കാം എന്നു ഡോക്ടർ പറഞ്ഞു.

അവൾ പറഞ്ഞ കാര്യങ്ങളൊക്കെ കേട്ട ഡോക്ടർ ഞെട്ടി. ഇങ്ങനെ ഒരു മറുപടി അവളിൽ നിന്നു വരുമെന്നു അദ്ദേഹം പ്രതീക്ഷിച്ചില്ല. പതിനഞ്ചു ദിവസങ്ങൾ കഴിഞ്ഞു വീണ്ടും വന്നു കാണാൻ പറഞ്ഞു അയച്ചു.

പതിനഞ്ചു ദിവസങ്ങൾക്ക് ശേഷം ഡോക്ടറിനെ കാണാൻ അവൾ വന്നു. ഡോക്ടർ രഞ്ജിനിയെ മാത്രം വിളിച്ചു കൊണ്ടു പോയി തനിയെ സംസാരിച്ചു. ഓരോ വാക്കായി അവൾ ഇടവെട്ടു പറഞ്ഞു. വീണ്ടും കാര്യമായി മുഴുവനും പറയാൻ തുടങ്ങി രഞ്ജിനി.

ചില മാസങ്ങൾക്ക് മുമ്പ് ഞാൻ ഒരു സ്വപ്നം കണ്ടു. കോളേജ് വിട്ടു വൈകുന്നേരം വീട്ടിനു തിരിയുമ്പോൾ വേഗതയോട് ഒരു കാർ പിന്നിൽ ബ്രേക്കിങ്ങ് തൊട്ടും തൊടാതെ നിന്നു. പേടിച്ചു താഴെ വീഴ്ന്നപ്പോൾ കാരിന്റെ ഹെഡ്‌ലൈറ്റു എന്റെ തല തട്ടി. കൈവച്ചു നോക്കുമ്പോൾ രക്തം ഒഴുകി കൊണ്ടിരുന്നു. കാരിനെ ഓട്ടിച്ച യുവാവ് കർച്ചീഫ് എടുത്ത് രക്തത്തിനെ തുടച്ചു പിൻവശം സീറ്റിൽ ഇരുന്ന സ്ത്രീയുടെ അടുത്ത് ഇരുത്തി അവളോട് നോക്കി കൊള്ളാൻ പറഞ്ഞു കൊണ്ടു ആശുപത്രിക്ക് കാരിനെ ഓട്ടിച്ചു. പ്രഥമ ശുശ്രൂഷ ചെയ്ത് വീട്ടിൽ കൊണ്ടുവന്നു വിട്ടുപോയി. പിന്നെ അറിയാൻ സാധിച്ചത് പിൻവശം സീറ്റിൽ ഇരുന്നതു അദ്ദേഹത്തിന്റെ ആഫീസിൽ ജോലി ചെയ്യുന്ന സ്നേഹോ. കാരിനെ ഓടിച്ചു വന്ന യുവാവിന്റെ പേരും നാടും ഒന്നും ഞാൻ ചോദിച്ചില്ല. അദ്ദേഹം പറഞ്ഞില്ല.

അങ്കിളിനെ നോക്കുമ്പോൾ അതേ മുഖം, അതേ കണ്ണുകൾ, പക്ഷേ തലമുടി മാത്രം നരച്ചു കാണപ്പെട്ടു. എന്നെ അറിയാതെ അദ്ദേഹത്തോടു സ്നേഹം തോന്നി. ചിലപ്പോൾ ഇദ്ദേഹത്തെ വിവാഹം ചെയ്താൽ എന്തെന്നു ഒരു ആഗ്രഹം. നടക്കുന്ന കാര്യമാണോ! അമ്പത്തിഅഞ്ചു വയസ്സ് കഴിഞ്ഞ യുവ കിഴവനെ സ്നേഹിക്കാനോ .

മാതാപിതാക്കൾ സമ്മതിക്കുമോ! ഹേ! ഹേ! എന്തുകൊണ്ടു ഈ വിചിത്ര ആഗ്രഹം. അവർ പറഞ്ഞു അവസാനിച്ചു.

മൗനമായി കേട്ടുകൊണ്ടിരുന്ന ഡോക്ടർ രഞ്ജിനിയുടെ മാതാപിതാക്കളെ വിളിച്ചു വരുത്തി. ഇവളുടെ അസുഖം എന്താണു എന്നു എടുത്തു പറഞ്ഞു. ഇവൾക്ക് വന്ന അസുഖം 'ബഹുമാന്യ സ്നേഹം' Respected Love. ഈ അസുഖത്തെ മാറ്റാൻ ഒരു വഴി പറഞ്ഞു. അതു നിറവേറ്റാൻ സ്വന്തം വീട്ടിൽ താമസിക്കുന്ന ഗോപൻ ഒരു വർഷം സ്ഥലംവിട്ടു. വാടക വീട്ടിൽ താമസിക്കുന്ന സ്ഥിതിയായി.





LETTERS



ALL INDIA POWER ENGINEERS FEDERATION

(REGISTERED UNDER SOCIETIES ACT XXI of 1860), Regd. No. 24085/93

REGD HEAD OFFICE B-1A/45A, Janakpuri, New-Delhi-10058

Corres. Address of CHAIRMAN-Hydel Field Hostel, 17 Rana Pratap Marg Lucknow-226001

M: 09415006225 Phone : 0522-2205417(Off), FAX:0522-2205417/0522-4079628

Email : ersdubey@yahoo.com / ersdubeylko@gmail.com & chairmanaipef@gmail.com

No 50 / Electricity (Amendment) Bill 2014

15 - 07 -2015

Sri Narendra Modi,
Hon'ble Prime Minister,
Government of India
152, South Block, Raisina Hill
New Delhi - 110 011.

Sub : Cancellation of enactment process of Electricity (Amendment) Bill, 2014.

Respected Sir,

- I on behalf of All India Power Engineers Federation (the only federation of power engineers working in all state power utilities, CEA, BBMB, DVC) representing more than 80000 power engineers of the country put this fervent appeal for your consideration and needful action to ensure affordable and uninterrupted access to Electricity for the people of India.
2. You are aware that, 30 crore people of India still do not have access to Electricity. In the course of enactment of Electricity Act, 2003 Government of India assured cheaper Electricity for all by 2007 through improved efficiency and competition. In practice within a decade, Electricity tariff has been escalated multiple times. NCCOEEE opposed Electricity Bill 2001 apprehending recurrence of disaster like California crisis through blanket privatisation. Accumulation of loss worth Rs. 26,000 crores through five decades was the main reason behind unbundling of SEBs. Present study of accumulated loss of DISCOMs exceeded Rs. 2.5 lakh crores within one decade & debt is about Rs 3lakh crores since implementation of Electricity Act, 2003. Private DISCOMS / Franchisees enjoy tariff hike but avert to pay dues of state/central PSUs. Worst consequence is volatility in short term market. Price varied between Re 1.00 to Rs. 20.00 through trading and speculation.



Benefit of Electricity Act, 2003 has resulted into all round negativity so far interest of people is concerned. World Bank report published in June 2014 admitted that unbundling of SEBs did not yield any positive result. As per their study, still vertically integrated corporate entity KSEB Ltd. & HPSEB Ltd are the two best performer Electricity Utility in the country.

3. India is having surplus generating capacity of 1 lakh MW excess over the demand adversely affecting PLF achieved so far. But 8-10% peak shortage is faced everyday in some parts of our country. Similar tune of Energy shortage are also being faced. While 50,000 MW privately owned capacities are on the verge of becoming NPA. Natural Energy resources are being transferred to private hands giving up the National interest. Much trumpeted UMPP has turned into scandal, when, Government itself leans to vitiate weighted average tariff fixed for 25 years through ICB. Amidst this situation your Government has initiated Electricity (Amendment) Bill, 2014 to pave the way of private participation in the Power supply sector without any investment of capital for improvement of the industry. Ruinous attempt of segregation of Electricity distribution into carriage and content has been planned to throw further burden upon state owned distribution utilities vesting Universal Supply Obligation. While the private supply companies will enjoy the benefit of cherry picking.
4. All India Power Engineers Federation (AIPEF) notes with serious concern that, the Government, while doing their best to satisfy the business houses, at the cost of people, also understands that the most important service of Electricity for public life, cannot be left at the whims of the profit mongers. How far your Government depends upon the profit preying private entrepreneurs for public service transpired through Section 14 of the Bill partly quoted here under:

“Provided also that at least one of the supply licensee shall be a Government company or Government controlled company:”

Policy of Government of India is found to defame public sector and pamper private entrepreneurs through morale, financial and all round out of the way support to extend their business with escalating profit. Upon this policy the Electricity (Amendment) Bill, 2014 has been drafted. The Government Company, as proposed above will have to shoulder the burden, while profit will be siphoned to private companies.



5. AIPEF encloses hereto (Annexure-I), the views of the State Governments placed before the Parliamentary Standing Committee of Energy to whom Bill was referred to. It transpires that most of the states opposed the proposition of Government of India, while the committee observes "that there has been encouraging response from most of the States on the idea of Segregation of Carriage and Content." In total jeopardy of federal structure of the country your Cabinet has approved the Bill for placing before the Parliament for adoption.

I quote from Parliamentary Standing Committee. "The Committee also had detailed interaction with the industry Associations / Power Producers on the Bill. The participants were ASSOCHAM, CII, APP, IPPAI and FICCI. All the participants were unanimously in favour of the proposed amendment to introduce Segregation of Carriage and Content in the sector."

Power Engineers are aggrieved to note that the Parliamentary Standing Committee has mentioned in their report they have consulted all the stake holders. But neither of the organizations of Power sector Employees and Engineers, placed their memorandum to the committee have been invited for discussion nor their views taken up for consideration. Neither the state Governments, nor the employees and engineers were found as stake holder in the Power industry. Only views of the business community, has been prioritized for consideration. We express vehement objection.

This impugned Bill has intended to ensure grid security but has not taken into consideration the fate of more than 1 million Contract workers in Power sector serving with worst form of exploitation without minimum level of safety, sacrifice their life to ensure uninterrupted supply of electricity to keep life in India vibrant.

6. In fine, AIPEF along with all its constituents covering across the country note with grave concern that this Bill, if enacted with its present form and content, will curb the right to electricity for wider cross section of people, having limited capacity to pay, being ousted from the common ambit through the process of cherry picking by the new entrants as Supply Licensee.

In fine, AIPEF like to conclude, the Electricity (Amendment) Bill 2014 shall fail to address the real requirement of the people of the country and rather further



aggravate the situation as in the case of Electricity Act 2003. Upon the above circumstances, we request you to drop the idea of enactment of such one sided Bill to cope only with the scope of profit greed of business houses.

7. AIPEF modestly like to submit before you, if your Government moves further towards enactment of the Bill by placing it in the Parliament for discussion all power engineers of state power utilities, CEA, BBMB & DVC alongwith **all the major organizations of Electricity Employees and Diploma Engineers will resort to one day token strike / work boycott as a mark of protest, on the day of placing the Bill in either house of the Parliament. National Coordination Committee Of Electricity Employees & Engineers (NCCOEEE) has already served this notice to Govt Of India on 01 July, 2015 of which AIPEF is a signatory. This letter is in continuation of NCCOEEE memorandum for your kind information. Copy of NCCOEEE memorandum is attached for ready reference.**

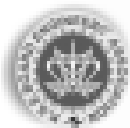
Thanking you with with regards.

Most Sincerely Yours

SHAILENDRA DUBEY
CHAIRMAN

CC.

1. Power Minister , GOI, New Delhi.
2. Chief Minister – All States



NATIONAL COORDINATION COMMITTEE OF ELECTRICITY EMPLOYEES & ENGINEERS

B.T.RANADIVE BHAWAN, 13-A, ROUSE AVENUE, NEW DELHI -110 002,

Tel fax.011- 23219670 E-mail: eefederation@gmail.com

1st July, 2015

**Sri Narendra Modi,
Hon'ble Prime Minister,
Government of India
152, South Block, Raisina Hill
New Delhi - 110 011.
Fax : 011-23016857**

Sub : Cancellation of enactment process of Electricity (Amendment) Bill, 2014.

Dear Sir,

We on behalf of the National Co-ordination Committee of Electricity Employees and Engineers (NCCOEEE), a broad based platform of all major Federations of Power sector Employees and Engineers of the country put this fervent appeal for your consideration and needful action to ensure affordable and uninterrupted access to Electricity for the people of India.

You are aware that, 30 crore people of India still do not have access to Electricity. In the course of enactment of Electricity Act, 2003 Government of India assured cheaper Electricity for all by 2007 through improved efficiency and competition. In practice within a decade, Electricity tariff has been escalated multiple times. NCCOEEE opposed Electricity Bill 2001 apprehending recurrence of disaster like California crisis through blanket privatisation. Accumulation of loss worth Rs. 26,000 crores through five decades was the main reason behind unbundling of SEBs. Present study of accumulated loss of DISCOMs exceeded Rs. 2.5 lakh crores within one decade & debt is about Rs 3lakh crores since implementation of Electricity Act, 2003. Private DISCOMS / Franchisees enjoy tariff hike but avert to pay dues of state/central PSUs. Worst consequence is volatility in short term market. Price varied between Re 1.00 to Rs. 20.00 through trading and speculation. Benefit of Electricity Act, 2003 has resulted into all round negativity so far interest of people is concerned. World Bank report published in June 2014 admitted that unbundling of SEBs did not yield any positive result. As per their study, still vertically integrated corporate entity KSEB Ltd. & HPSEB Ltd are the two best performer Electricity Utility in the country.

India is having surplus generating capacity of 1 lakh MW excess over the demand adversely affecting PLF achieved so far. But 8-10% peak shortage is faced everyday in some parts of our country. Similar tune of Energy shortage are also being faced. While 50,000 MW privately owned capacities are on the verge of becoming NPA. Natural Energy resources are being transferred to private hands giving up the National interest.



Much trumpeted UMPP has turned into scandal, when, Government itself leans to vitiate weighted average tariff fixed for 25 years through ICB.

Amidst this situation your Government has initiated Electricity (Amendment) Bill, 2014 to pave the way of private participation in the Power supply sector without any investment of capital for improvement of the industry. Ruinous attempt of segregation of Electricity distribution into carriage and content has been planned to throw further burden upon state owned distribution utilities vesting Universal Supply Obligation. While the private supply companies will enjoy the benefit of cherry picking.

NCCOEEE note with serious concern that, the Government, while doing their best to satisfy the business houses, at the cost of people, also understands that the most important service of Electricity for public life, cannot be left at the whims of the profit mongers. How far your Government depends upon the profit preying private entrepreneurs for public service transpired through Section 14 of the Bill partly quoted here under:

“Provided also that at least one of the supply licensee shall be a Government company or Government controlled company:”

Policy of Government of India is found to defame public sector and pamper private entrepreneurs through morale, financial and all round out of the way support to extend their business with escalating profit. Upon this policy the Electricity (Amendment) Bill, 2014 has been drafted. The Government Company, as proposed above will have to shoulder the burden, while profit will be siphoned to private companies.

We enclose hereto (Annexure-I), the views of the State Governments placed before the Parliamentary Standing Committee of Energy to whom Bill was referred to. It transpires that most of the states opposed the proposition of Government of India, while the committee observes “that there has been encouraging response from most of the States on the idea of Segregation of Carriage and Content.” In total jeopardy of federal structure of the country your Cabinet has approved the Bill for placing before the Parliament for adoption.

We quote from Parliamentary Standing Committee. “The Committee also had detailed interaction with the industry Associations / Power Producers on the Bill. The participants were ASSOCHAM, CII, APP, IPPAI and FICCI. All the participants were unanimously in favour of the proposed amendment to introduce Segregation of Carriage and Content in the sector.”

We are aggrieved to note that the Parliamentary Standing Committee has mentioned in their report they have consulted all the stake holders. But neither of the organizations of Power sector Employees and Engineers, placed their memorandum to the committee have been invited for discussion nor their views taken up for consideration. Neither the state Governments, nor the employees and engineers were found as stake holder in the Power industry. Only views of the business community, has been prioritized for consideration. We express vehement objection.

This impugned Bill has intended to ensure grid security but has not taken into consideration the fate of more than 1 million Contract workers in Power sector serving with worst form of exploitation without minimum level of safety, sacrifice their life to ensure uninterrupted supply of electricity to keep life in India vibrant.



In fine, NCCOEEE along with all its constituents covering membership of Two Million Electricity Workers and Engineers across the country note with grave concern that this Bill, if enacted with its present form and content, will curb the right to electricity for wider cross section of people, having limited capacity to pay, being ousted from the common ambit through the process of cherry picking by the new entrants as Supply Licensee.

In fine, we like to conclude, the Electricity (Amendment) Bill 2014 shall fail to address the real requirement of the people of the country and rather further aggravate the situation as in the case of Electricity Act 2003. Upon the above circumstances, we request you to drop the idea of enactment of such one sided Bill to cope only with the scope of profit greed of business houses.

We modestly like to submit before you, if your Government moves further towards enactment of the Bill by placing it in the Parliament for discussion, **all the major organizations of Electricity Employees and Engineers will resort to one day token strike / work boycott as a mark of protest, on the day of placing the Bill in either house of the Parliament.**

Thank you,

Most Sincerely Yours,

Sailendra Dubey
AIPF

A B Bardhan Prasanta N Chowdhury
AIFEE EEFI

Kuldip Kumar
INEWF

V Ashok Kumar
AIFOPDE

Samar Sinha
AIPF

S Rathina Sabapatty
TNEBWPU

Annexure-1

Excerpts of the Submission of different State Governments before the Standing Parliamentary Committee on Energy : Reg. Electricity (Amendment) Bill, 2014.

Sl no.	State	Views on Segregation of Carriage and Contents
1.	Bihar	In our view, it is not workable ... But so far as the wire licensee is concerned, it says that there will be single licensee and particularly the Government licensee in almost all the States except a few. ... If there is single wire licensee then the first inherent danger will be of monopoly and then there will be chances of discrimination. The fair play will not be there...
2.	Karnataka	...In this situation where we have shortages in supply and when the infrastructure development is not full, and we are still not in a position to supply 24X7 power in all the areas, it may not be prudent to have this not... The choice to the consumer should be available. But there should not be a choice to the supply company. He shall take whosoever applies for it. If this is so, then it could take care of the problems.



3.	Gujarat	...Unless a level playing field is provided to all the suppliers, the challenge of actual implementation on the ground is very difficult. Then, it is going to be a collapse of system. In the process it is the common consumer who will suffer. It is only the industrial, commercial and high end consumers who will benefit but everybody else will suffer...Another thing, which will be very critical in terms of segregation of carriage and content, is the Universal supply Obligation. Supply itself should be allowed to pick and choose. That means that cherry picking will happen.
4.	Himachal Pradesh	We have some reservations so far as our State is concerned... Further unbundling of distribution sector into supply and distribution segments will, first of all, have an impact on the cost. Ultimately, the cost is to be borne by the consumer because of the multiplicity of units... On that account, we are saying that it should not be straightaway made mandatory for us... Finally, this being a Concurrent subject, it should not be must that it has to be unbundled.
5.	Kerala	The opinion of the State Government of Kerala with regard to segregation of content and carriage is that it should not be made mandatory... There are 4,000 SC/ST consumers who are giving us 30 percentage of the revenue. This is one area where cherry-picking can be done immediately... Regarding the concept of "supplying licensee", what is the role of a "supplying licensee"? It is not very clear from this... If there is a problem with regard to the quality of supply, who is to be blamed? Is it the 'supplying licensee' or the 'distribution licensee'?... It will create a problem between the 'supplying licensee' and the 'distribution licensee'... When the incumbent licensee's cost of operation itself is on the higher side, the new supplier who is coming in will be able to get power which is already contracted by the 'distribution licensee' at lower rates and supply it to the high end consumers. It means that the incumbent licensee will bleed.
6.	Goa	In regard to carriage and content, whatever Karnataka and Kerala have mentioned, those are also our concern.
7.	Jharkhand	We are of the view that the segregation should not be done although in our State the segregation of carriage has taken place... Cherry picking is taking place. As result



		they are only picking up the HT consumers. And the JSEB (now the Jharkhand Urja Vikas Nigam Limited) has to take care of entire rural consumers throughout the State. So, this is a proposition which is completely adverse.
8.	Delhi	...The distribution entities are also the supply entities as of now. So, if there is a segregation of carriage and content, one would see that the distribution companies would be reduced to only earning the wheeling charges. What would be the liabilities that they would carry if they are already in Power Purchase Agreements for 25 years? Are we going to revisit those Power Purchase Agreements? Are the supply companies going to enter into new Power Purchase Agreements? In that case what will happen to the liabilities of the old distribution company who are also the supply company? So, those things need to be factored in.
9.	Maharashtra	The essential part in the Act is basically segregation of carriage and content... One is responsibility of the supply agency to pick up universal service obligation. It should not be cherry picking some customers and not taking the rest of them... There could be one zone which is very good and therefore, we need to ensure that USO is supported. Essentially the cross subsidy which is currently operating and that needs to be sorted out and some kind of a surcharge needs to be put on the supply company which is going to be present.
10.	Tamil Nadu	Basically we are saying that with the separation of carriage and content this Bill in one stroke will make all the State utilities unviable. The view of the State is that we are against this amendment of separation of carriage and content. The reason is, we are giving unbridled access to private players to cherry-picked consumers who are high-paying and who can be supplied power directly. He is not going to make any investment into distribution network. Without making investment into distribution network, he is getting best paying consumers for supplying electricity and that too without loss. Further, he will cherry-pick the consumers; he pick up consumers in urban areas or high value consumes in rural areas... we are against it in toto.
11.	Madhya Pradesh	Our suggestion is that the point of last resort should be the State Government and let the State Government



		instruct or direct that company to fulfill that obligation so that the DISCOM or the incumbent licensee gets compensated for serving that area and that class.
12.	Odisha	In the Bill it is proposed that it should be in the consumer's premises. So, the consumer meter is the point of separation between the distribution licensee and the supply licensee. We feel this will be extremely difficult. This would lead to a lot of litigations and a lot of disputes will come which will be overwhelming.
13.	Rajasthan	There is this question, of course, of how we avoid the discoms, the State entities which will be having the obligation of the last resort to not be overburdened because of the cherry-picking.
14.	Telangana	In the first phase, we want the present distribution company to be segregated into the distribution and retail and let this model work for four or five years and depending on the experience that we gain out of this separation, maybe after four years, in second phase, we can allow private players to come into the retail.
15.	Uttarakhand	...there are vital points which should be clearly specified regarding cross subsidy and cherry picking, as it has already been discussed, PPA segregation and then appointment and apportionment of distribution losses. There will be problems to the consumers also.
16.	Puducherry	The Government of Puducherry has taken a decision not to unbundled it at the initial stage itself. So, segregation of carriage and content also may not be a possible solution for the Government of Puducherry... If private players come into that, the segregation and competition would not be good for the consumers because there will cherry picking and these kinds of things can be expected.
17.	Andhra Pradesh	The major concern, the carriage and content separation is going to be a difficult task, so a very cautious approach is required as has been told by our technical people.
18.	Chandigarh	What is perhaps correct in Europe or America today, it may not be so applicable today to us. Maybe, one or two States have sufficiently settled the things. They can embark on the next step. But for the rest, I think, the common sentiment is there. We will also adhere to the same.



☛ Prime Minister to Launch Deendayal Upadhyaya Gram Jyoti Yojana

Deendayal Upadhyaya Gram Jyoti Yojana

The Prime Minister Shri Narendra Modi will be launching Deendayal Upadhyaya Gram Jyoti (DDUGJY) in

Patna. The DDUGJY is one of the flagship programmes of the Ministry of Power and will facilitate 24x7 supply of power. This scheme will enable to initiate much awaited reforms in the rural areas. It focuses on feeder separation (rural households & agricultural) and strengthening of sub-transmission & distribution infrastructure including metering at all levels in rural areas. This will help in providing round the clock power to rural households and adequate power to agricultural consumers. The earlier scheme for rural electrification viz. Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) has been subsumed in the new scheme as its rural electrification component.

The major components of the scheme are feeder separation; strengthening of sub-transmission and distribution network; Metering at all levels (input points, feeders and distribution transformers); Micro grid and off grid distribution network & Rural electrification- already sanctioned projects under RGGVY to be completed. The Scheme has an outlay of Rs 76000 crore for implementation of the projects under which Government of India shall provide Grant of Rs 63000 crore. A total of Rs 14680 crore worth projects have already been approved out of which projects amounting to Rs 5827 crore have been approved for Bihar state.

Under this scheme, an Agriculture intensive state like Bihar shall benefit from works of feeder separation. Thousands of kilometres of new lines shall be laid and hundreds of new substations have been planned. The implementation of this scheme shall ensure the improvement in agricultural productivity and electrification of all the households.

Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY)- An Over view :

1. Background:

- The rural agricultural and non-Agriculture consumers (domestic and non-domestic load) of the country are generally serviced through the local distribution network. Many rural areas of the country face insufficient electricity supply, consequently the distribution utilities are forced to resort to load shedding, thus affecting the power supply to both Agriculture and non-Agriculture consumers.

Indian Power Sector Roundup



- The demand of power in rural areas is increasing day by day due to changing consumer base, improving living standards for which augmentation of rural infrastructure needs to be regularly undertaken
- The investment in the distribution network is low due to bad financial health of the distribution companies. Therefore in order to augment the reliability and quality of supply distribution network needs to be strengthened.
- To improve the commercial viability of power distribution, there is need for metering of all categories of the consumers

2. DeenDayal Upadhyaya Gram Jyoti Yojana (DDUGJY)

Keeping in view the above problems, Ministry of Power, Government of India has launched Deen Dayal Upadhyaya Gram Jyoti Yojana for rural areas having following objectives:

- i) To provide electrification to all villages
- ii) Feeder separation to ensure sufficient power to farmers and regular supply to other consumers
- iii) Improvement of Sub-transmission and distribution network to improve the quality and reliability of the supply
- iv) Metering to reduce the losses

3. Financial provisions:

- Scheme has an outlay of Rs 76000 Cr for implementation of the projects under which Government of India shall provide Grant of Rs 63000 Cr
- A total of Rs 14680 Cr worth projects have already been approved out of which projects amounting to Rs 5827 Crs have been approved for Bihar state.

4. Benefits from the scheme

- All villages and households shall be electrified
- Increase in agriculture yield
- Business of Small and household enterprises shall grow resulting into new avenues for employment
- Improvement in Health, Education, Banking (ATM) services
- Improvement in accessibility to radio, telephone, television, internet and mobile etc
- Betterment in social security due to availability of electricity



- Accessibility of electricity to schools, panchayats, hospitals and police stations etc
- Rural areas shall get increased opportunities for comprehensive development

(Source : PIB)

☛ **Government Stands Committed to make LED a Way of Life in India : Shri Piyush Goyal**



Shri Piyush Goyal, Union Minister of State (IC) for Power, Coal, and New & Renewable Energy said that the Government is committed to make LED lights a way of life in India. While addressing a conference on 'Business of Lighting' here today Shri Goyal said that the aim of the government is to completely replace all incandescent bulbs in the country with LED lights in next three years. This will provide huge business opportunity to the lighting industry. Shri Goyal hopes that

in next 3 years India can rapidly expand LED market.

Urging the whole lighting fraternity to correct the market pricing of LED , Shri Goyal said that it cannot be anomalous situation where government procure LED bulb at Rs 72/ unit and market continues to price itself very high. The gap still looks unreasonably huge. Correcting this gap will help them to increase the production in terms of volumes, Shri Goyal added. He further said that Government is facilitating industry to mature and reach to every home by promoting the LED programme in the country. He further said that Government is capable of providing LED bulbs to every household at lower rates but it will remove the competitive edge from the industry. At the end of the day market forces have to take over, Shri Goyal added.

On the question of ensuring availability of quality LED products , Shri Goyal appealed the lighting fraternity to become whistle blower for bad quality products coming into Indian market. He urged them to help set quality standards for imported products in the country. He emphasised that eventually it is the self regulation within the industry that will protect the nation from spurious products otherwise incentive of replacing incandescent bulbs will be lost. Shri Goyal said that there is scope for more innovation in the products related to LED. He stated that government is willing to support research and development for bringing innovation in this industry. Solar LED street lights are the future of this industry and it can provide unimaginable business opportunities in remote areas of the country. He wished Indian industry to not just assemble but also starts manufacturing the LED lightings.



On the occasion, Shri Goyal also launched National DELP Dashboard for continuous monitoring of LED distribution under 100 City Domestic Efficient Lighting Programme (DELP) managed by Energy Efficiency Services Limited.

☛ **National DELP Dashboard : An Overview**

National DELP Dashboard is an integrated, real-time, and web-based dashboard which dynamically refreshes at an interval of 15-sec to display in real-time, number of LEDs distributed at national level. This is achieved by aggregating real-time feeds from multiple states where DELP is ongoing.

National Dashboard also offers a DELP state view – allowing the user to view state wise DELP numbers on India's map, thus presenting at an interval of 15 sec the number of LEDs distributed at individual state level. Only the states where DELP is ongoing appear highlighted.

This real-time continuous monitoring is achieved by ensuring real-time electronic recording of each LED transaction executed at each DELP kiosk, a booth to facilitate distribution of LEDs, placed across the city. The kiosk level data is consolidated at city level, which in-turn is consolidated at state-level. The State level numbers aggregate to form the National DELP number displayed through a centralized web-based system.

The link to National DELP Dashboard is as follows: <http://delp.cruxbytes.com/forms/national-delp-dashboard.aspx>

Shri Piyush Goyal Launches Energy Efficient Lighting Initiatives in Varanasi

In a major initiative aimed at promoting energy efficiency in the city of Varanasi, Shri Piyush Goyal, Union Minister of State (IC) Power, Coal and New & Renewable Energy has launched Domestic Efficient Lighting Programme (DELP) and LED-Based Smart Street Light programmes in Varanasi .Launch of these initiatives heralds the government's pledge to cut down energy usage by 10,000 MW during peak hours by promoting LED lights across the nation. Central and State Government in association with Energy Efficiency Services Limited (EESL), a public sector entity under Ministry of Power, will distribute about 13 lakh LED bulbs to 2,28,496 Domestic Consumers, and replace 36,077 conventional street lights with energy efficient LEDs in Varanasi.

Speaking on the occasion Shri Goyal said "With energy-efficient LED lights, demand of electricity in Varanasi will be down by 45 MW and lead to savings to the tune of Rs. 68 crore. The innovative business model of conversion of conventional streetlights with energy efficient LED street lights has the potential of replication as it obviates the need for any capital investment by Municipal bodies. This will also lead to substantial savings in energy during peak hours while at the same time enhancing the service quality of the lights." "There will be considerable savings on the street lights as well as in the domestic sector in due course. This should help ensure 24x7 supply to



every household." Shri Yassir Shah, Minister of Energy , UP also spoke during the inauguration of LED based EE initiatives in Varanasi

EESL will replace the estimated 36,077 conventional street lights with energy efficient and smart LED lights across the city at its own cost. Over the course of 5-7 years, municipalities will use part of the savings in energy and maintenance cost to repay EESL. Provided with free replacements and maintenance of lights at no additional cost, municipalities can affordably install state-of-the-art long-lasting and energy efficient street lights at no upfront capital cost. This will enable the municipalities to obtain state-of-the-art and energy efficient LED street lights without any upfront cost or any additional future expenditure, and with 5 to 7 years of maintenance.

EESL in cooperation with Purvanchal Vidyut Vitaran Nigam Limited (PUVVNL) will also implement Domestic Efficient Lighting Programme across the city. The LED distribution programme will distribute about 13 lakh LED bulbs to grid-connected domestic consumers in Varanasi. Under DELP, each household having connected load of less than or equal to 2kw will be provided with up to five 7-Watt high quality LED bulbs at an initial payment of Rs.10 each followed by a recovery of Rs.110 each over a period of 11 months from electricity bills. In essence, a household can purchase a LED bulb at an overall cost of 120 as against the retail price of Rs.350-600 along with a 3-years free replacement warranty. It is estimated that the households will benefit Rs.162 per annum as savings in electricity bill (at current average tariff) for each LED bulb, exceeding Rs.120 purchase cost per LED. The combined impact of the Government's two initiatives could help Varanasi achieve energy savings to the tune of nearly 104 million kWh annually. This translates to a total cost savings of about Rs. 68 Cr per annum.

Energy Efficiency is a key thrust area of the Central and State Government and emphasis has been laid on scaling up its implementation. On a national level all incandescent bulbs will be changed to LED in three years. Announcement of these programme follows Hon'ble Prime Minister Shri Narendra Modi's pledge of, "wholehearted commitment towards energy conservation" and is aimed at realizing his vision of "24X7 affordable power for all.

(Source : PIB)

☛ MNRE plans for installation of 1 lakh Solar Pumps for Irrigation



The Ministry of New and Renewable Energy is implementing programme for installation of 1,00,000 of Solar Pumps for irrigation and drinking water through State Nodal Agencies and NABARD. This was stated by Sh. Piyush Goyal, Minister of State (IC) for Power, Coal & New and Renewable Energy in a written reply



to a question in the Lok Sabha today. The Minister further stated that ministry provides 30% capital subsidy to farmers for installation of Solar Pumps for irrigation purpose through State Nodal Agencies. State Government may also provide additional subsidy through own funds. Ministry also provides 40% subsidy with mandatory loan to farmers for irrigation purpose through NABARD.

The Minister further stated that Ministry has issued supplementary guidelines for 1,00,000 solar Pumps during 2014-15 and Rs.353.50 Crore was released to various agencies. Till now 63,436 pumps were sanctioned to various State Government agencies and 30,000 solar pumps were sanctioned to NABARD. The State Governments are subsidizing Solar Pumps so that farmers take this up in a big way. MNRE has also made provision in guidelines for injection of surplus power in the grid so that farmers can get some returns on the investment. Ministry has empanelled 53 Solar Pumps System integrators to operate through NABARD and are providing training, the Minister added.

(Source : PIB)

☛ **Daily spark missing in India's regional power trade**

India has emerged as a hub of south Asian transmission network but daily spark of day-ahead trading is missing in its cross-border power trade due to regulatory hurdles. Indian power exchanges have petitioned the Central Electricity Regulatory Commission to open doors to spot buyers from neighbouring countries as millions of units go waste at home due to busy transmission lines or poor appetite of financially stressed state utilities. Tata Power has petitioned the regulator for permission to import power from its 126 mw Dagachhu hydel project in Bhutan through the Indian exchanges for sale in India till bilateral contracts are signed. Industry sources say there are consumers in Nepal and Bangladesh, countries with large unmet demand, willing to buy power from the Indian spot market.

But for the regulator, it is a grey area as the existing policy does not reflect the changing reality of expanding interlinks with neighbouring countries and power projects coming up in Bhutan and Bangladesh with Indian private investments. The government is examining the new reality and at least Tata Power's case is pending the external affairs ministry's approval. The Indian grid is connected with Bhutan, Bangladesh and Nepal. Plans for establishing interlinks with Pakistan and Sri Lanka have remained enmeshed in the complexities of bilateral politics. Trade through the existing interlinks is guided by bilateral arrangements between governments. There is no third-party transit through the Indian network. India imports power from hydel projects it has set up in Bhutan and supplies electricity from a Central pool to Nepal and Bangladesh.



POWER PLAY

INDIA'S CURRENT ELECTRICITY TRADE

	Interconnections	Volume	Expected Interlinks
India-Nepal	22 lines of 132, 33 & 11 KV (Kilo Volt)	India exports 150 MW (Mega Watt)	400 kv AC double-circuit lines operated at 220 KV by 2016
India-Bhutan	400 and 220 KV DC (Direct Current) lines	India imported 6,389 million units in 2012-13. Gives support to Bhutan in dry season when output from hydel projects fall	Reinforcement of existing interlink proposed to provide wheeling capacity for new hydel projects coming on stream
India-Bangladesh	HVDC (High Voltage Direct Current) line	500 MW imported by Bangladesh	Upgrade of 500 MW line to 1,000 MW
India-Sri Lanka	Plan for undersea line hanging fire	No trading	500 MW HVDC bipole line
India-Pakistan	An on-and-off proposal	No trading	500 MW line



EXCHANGES IN INDIA
Indian Energy Exchange
Power Exchange India Ltd

EXCHANGES IN EUROPE

Austria	EXXA
Belgium	Belpex
Czech Republic	OTE
France	Powermex
Germany	EEX
Italy	GME
Netherlands	APX
Poland	TGE
Scandinavia	Nord Pool
Slovenia	Borzen
Spain	Omel
Romania	Opcom
UK	UKPX

The Dagachhu hydel project is the first of several private power projects being built on foreign soil for supplying to local market, India or a third country. Reliance Power and Adani group recently inked deal for large power plants in Bangladesh. The petitions by power exchanges point out that the ground is ready for cross-border trading because of financial and regulatory similarities in electricity markets of the interlinked countries. Initially, the volumes are expected to be small due to limited interlink capacity. But with plans for their expansion, a full-on regional power market is just round the corner, much in line with the scenario in Europe. India, with a rapidly expanding generation capacity - estimated at 2.72 gw (giga watt) at last count - and surrounded by deficit countries, can be in the driver's seat only if it moves fast.

(Source : ToI)



Unit meeting conducted at Thiruvananthapuram.



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Felicitation given to Er. V.Kesavadas for his promotion as the Chief Engineer (IT & Customer Relations) and to Er. Muhammed Sherif for his promotion as the DCE (Transmission South) by Tvm Unit.



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