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'Minor Planet' to be named after IESL's JIY-2010 Winner

by Rohan Mathes

Ceres Connection, a programme of the Massachusetts Institute of Technology's Lincoln Laboratory, is to name a 'Minor Planet' in honour of young Ganidu Nanayakkara, the winner of the Intel International Science and Engineering Fair (Intel ISEF) Grand Award in Computer Engineering, in San Jose USA, last year. He was also the winner of the 'Junior Inventor of the Year-2010' (JIY-2010) competition, of the Institution of Engineers, Sri Lanka (IESL) and the Sri Lanka Science and Engineering Fair (SLSEF) 2010 competition.

This was disclosed by the Chairman of the IESL's JIY Steering Committee, Eng. Jayavilal Meegoda, when he addressed the opening ceremony of the Sri Lanka Science and Engineering Fair-2011, at the IESL's Wimalasurendra Auditorium recently.

The Ceres Connection, in partnership with the Society for Science and the Public (SSP), promotes science education by its identification to honour the most outstanding students from SSP's competitions. It helps to name 'Minor Planets' discovered by the Lincoln Near Earth Asteroid Research (LINEAR) programme. This is a honour bestowed to any individual only once in a lifetime.

The Intel ISEF is the world's largest annual international pre-college science competition which provides a forum for over 1500 high school students from over 50 countries, to showcase their independent research. It is the premier science competition in the globe, exclusively for students in grades 9 to 12.

Eng. Meegoda further said that based on the theme "Lead the World with Science and Engineering", the IESL, National Science Foundation (NSF), Intel Sri Lanka and the Ministry of Education (MoE) has already inked a Memorandum of Understanding (MoU), for the betterment of the school-going fraternity of the land.

The Science Review Committee Chairman and Postgraduate Institute of Medicine Director Prof. Rizvi Sheriff, the Chief Guest, was of the view that competitions of this nature, paved the way for Motherlanka to evolve into a 'Knowledge Hub' and eventually become the 'Miracle of Asia'. "Sri Lanka is already on the map. This time too, we will select a project



which will have a profound impact on the whole world and human kind", he said.

NSF Director Dr. Sarath Abeywardane pointed out that the country needed a new and innovative generation of school children to meet the challenges of a rapidly growing economy and a competition of this caliber was paramount.

IESL President Professor Ananda Jayawardena, Intel Sri Lanka Country Manager Indika de Soya and Eng. Prasad Siriwardane also addressed the ceremony, prior to the evaluation of the projects.

SRI LANKAN EMERITUS PROFESSOR WINS INSTITUTION OF CIVIL ENGINEERS (Lond) AWARD



At the Asia Pacific Convention of the Institution of Civil Engineers-ICE (London) held on January 14, 2011 in Kuala Lumpur Malaysia, on the theme "Infrastructure development in the tropical environment" Vidya Jyothi Emeritus Professor Dayantha Wijeyesekera was judged the "Runner up" at the Competition on Papers presented by ICE

Country Representatives in the Asian Region.

The paper which was titled "Post Tsunami infrastructure rehabilitation in Sri Lanka" referred to the damage to infrastructure caused by the Tsunami of December 26, 2004, indicated the theory of the submarine wave which was propagated, subsequently the four phases of rehabilitation i.e. emergency measures, restoration of services and

facilities to pre-tsunami levels, challenges faced in the recovery process and the "Way forward" with an integrated cost effective approach together with more reliable early warning systems globally networked.

During the presentation of the paper Sri Lanka's High Commissioner for Malaysia, H.E. Dr B. D. Ranasinghe who was himself a victim of the 2004 Tsunami catastrophe, was present at the Convention along with a large number of Civil Engineers from different parts of the world.

Prof Dayantha Wijeyesekera who is the Chairman, Tertiary and Vocational Education Commission (TVEC) in the Ministry of Youth Affairs and Skills Development, is currently the ICE Country Representative for Sri Lanka since the demise of Dr A. N. S. Kulasinghe. He is hopeful

that the next ICE Asia Pacific bi-annual Convention will be held in Sri Lanka in 2013.

The Photograph shows the President of the Institution of Civil Engineers (London) Mr Peter Hansford presenting the award to Professor Dayantha Wijeyesekera at Hilton Hotel, Kuala Lumpur, Malaysia recently.

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Library News

New Additions to the Library To the Reference Section

01. Reynold's Reinforced Concrete Designer's Handbook - 11th Ed.
02. Field Manual for Highway & Bridge Engineers- 3rd Ed./Reina
03. Handbook of Switchgears / BHEL
04. Handbook of Reinforced Concrete Design / Singha, S.N
05. Steel Designers' Handbook / Gorenc, B, Tinyou, & Syam
06. Architects Malaysia /PAM
07. Shapers of Modern Malaysia
08. Engineering : Issues, Challenges & Opportunities for Development / UNESCO

To the Lending Section

01. Applied Electromagnetic Theory /Nair
02. Advanced Surveying : Total Station GIS & Remote Sensing / Gopi
03. Quality Control & Management /Evans
04. Theory of Beam Columns : Space behavior & Design / Chen
05. Fundamentals in Engineering Drawing -11th ed./ Warren
06. The Construction of Buildings -3rd ed.- Vol. 01 - Vol.05 / Barry
07. Engineering Drawing & Graphics -5th ed./ Venugopal
08. An Introduction to Reactive Power Control & Voltage stability in Power Transmission systems / Chakrabarti
09. Complete Book for Developing Your IQ /Azzopardi
10. Advanced Foundation Engineering / Murthy
11. Lightweight Aggregate Concrete /Chandra
12. Instrument Transducer an Introduction to their performance & Design /Neubert
13. Civil Engineering Materials- 5th ed./ Jackson
14. Solved Problems in Electromagnetic /Nasar
15. Principles of Digital Electronics /Meena
16. Analog Electronics /Pitter
17. Modern Control Systems - 11th ed./ Dorf
18. Circuits /Carlson
19. Modern Electronic Instrumentation & Measurement Techniques / Helfrick
20. Customizing AutoCAD 2009 /
21. Engineering Graphic with AutoCAD 2006 /Bethune
22. Miller & Fruends Probability & Statistics for Engineers - 6th ed./Johnson
23. Management -6th ed. /Stoner
24. Alternating Current Machines /Rajput
25. Advances in Renewable Energy Technologies 11th ed./ Pawar

PROFESSIONAL SERVICES

The Export Development Board (EDB) has identified the "Professional Service Sector" as a priority area in the Sri Lanka's export market. In order to achieve global attention the EDB has recently launched a web portal highlighting the local capabilities in this sector.

The URL of this portal is www.srilnkaserviceexport.com

Sri Lankan missions abroad have been informed to refer to this portal to cater to inquiries.

Those (individuals and organizations) who wish to make use of this service, need to get registered with the EDB. Registered organizations will be provided with password protected pages in the web portal. For the present new entrants are not charged a registration fee.

Hurry and get yourself registered.
Further inquiries Mr. Sashika De Mel - Export Promotion Assistant or Mr. M K S K Maldeni, Acting Director, Export services
Tel. 011 2300705 - 10.

Meet your Council 2010 / 2011

Eng(Major) Nishsanka Wasalabandara Chairman Civil Engineering Sectional Committee



BSc Eng CEng, MSc in Water Res Mgt, MIE(SL), MIM (SL), Dip in Bus Mgt(UK)

Eng. Nishsanka Wasalabandara is the Chairman of Civil Engineering Sectional Committee and Council Member of the Institution of Engineers, Sri Lanka. He is currently the Project Director in the Ministry of Research and Technology. He is also one of the Directors in Rudra Engineering & Architectural Consultancy Organization, No 08, Nallur Cross Road, Jaffna and the Consultant for EDC Construction (Pvt) Ltd, No 106, DS Senanayake Mawatha, Colombo 08. He appears in the Arbitration Courts as an Expert Witness too.

He studied in A/ Hiripitiyagama Vidyalaya and A/ Kekirawa Central College. Eng

Wasalabandara obtained BSc Engineering degree specialized in Civil Engineering from the University of Peradeniya in 1994, and a Post Graduate Diploma in Business Management. He has also completed a Master of Science Degree in Water Resources Management conducted by the Post Graduate Institute of Science, Peradeniya.

Eng Wasalabandara joined EDC Construction (Pvt) Ltd as a Site Engineer to serve in Minipe Nagadeepa Irrigation Rehabilitation Project in 1994. He joined the regular force of Sri Lanka Army as a Garrison Engineer in 1995 and was commissioned as a Captain and promoted to the rank of Major in due course. After completing a thirteen year period of continuous service in Sri Lanka Army, Eng Wasalabandara served in Central Engineering Consultancy Bureau, National Water Supply & Drainage Board and Water Resources Board as Resident Engineer - Kerawalapitiya Power Project, Chief Engineer - Greater Colombo (Southern Catchment) Sewerage Rehabilitation Project and as Asst.

General Manager (Engineering) respectively. He assumed duties as the Project Director - Multi Purpose Gamma Irradiator Project in the Ministry of Research and Technology on 10th January 2011.

He has a special concern to implement a National Policy to mitigate wastage and pollution of water resource as an adaptive measure for Global Climate Change related issues. He has written several reports for water management and drastically reduced the water bill during his duties in Sri Lanka Army. (2001 - 2004), he submitted a proposal for revision of the system of allocation and monitoring of funds for water and electricity in Army installations. Later he actively contributed for preparation of National Policy for Climate Change Adaptation in Sri Lanka. He was the key person to prepare the Water Sector Report for the Second National Communication on Climate Change for United Nations Framework Convention on Climate Change. He is currently conducting a research for Studying Adaptive Capacity for Climate Changes Related Issues Through Improving Tanks Culture in Sri Lanka. He has also written articles for the news papers to improve the public awareness for preserving water sources in Sri Lanka.

Eng (Prof.) S. L. J. Wijeyekoon Chairman Chemical Engineering Sectional Committee



**Age: 45 years
BSc Eng (Hons), M. Eng (Tokyo), PhD (Tokyo), CEng, MIE (Sri Lanka)
Professor of Chemical Engineering, University of Moratuwa**

Eng. (Prof.) Suren Wijeyekoon graduated with BSc Eng Hons degree specialized in Chemical Engineering with 1st Class Honours from the University of Moratuwa in 1992. He obtained a M. Eng. in Environmental Engineering in 1997 and a PhD in Environmental Engineering in 2000 from

University of Tokyo, Japan. He became a Corporate Member of IESL in 2007 and was Chairman, Chemical Engineering sectional committee for the session 2008/2009. He is also a Member of the International Water Association (IWA) and former Treasurer, Sri Lanka Metal Finishing Association (SLMFA).

He commenced his career in 1992 as a Technical Service Engineer for NALCO South East Asia (Pvt) Ltd engaged in water and wastewater treatment and had his initial training in NALCO laboratories in Singapore. He joined University of Moratuwa in 1993 as a Lecturer and proceeded to Tokyo, Japan for his postgraduate studies in 1994. On his return, he served as a Senior Lecturer from 2001 and was promoted to Professor of Chemical Engineering in 2009.

He has published two book chapters in 'Water Global Common and Global Problems: Grover Velma I. (ed) Science Publishers Inc (USA)' and 'Trends in Biotechnology Research, Edwin C. Hearn (ed), NOVA Publishers (USA)'. He has also published more than 35 papers related to waste water treatment in local and international conferences and international journals. He is the recipient of several awards for his research publications and academic performance including Presidential Award for Scientific Research for 2004, Award for Outstanding Research Performance at University of Moratuwa continuously from 2004 to 2009, Unilever Award for the best Design Project, Union Carbide award and Ceylon Petroleum Corporation Scholarship for his undergraduate academic performances in Chemical

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Meet your Council 2010 / 2011

Eng. T K G Ranasinghe
Chairman
Agricultural and Planning Engineering
Sectional Committee



**BSc (Eng), CEng (UK),
MIMechE (UK), MIET (UK),
FIE (SL), Int PE (SL), MPRI
(SL)**

Resume of Experience

Graduate and chartered mechanical engineer with 45 years experience. First 10 years in setting up, operation, production & quality control, and management of coconut and agro-industry/ small & medium enterprises. Latter 35 years experience as a consulting engineer/agro-industry consultant for SMEs in pre-feasibility and feasibility studies, diagnostic studies, rehabilitation, restructuring and privatization studies, valuations, technical audits, in-depth evaluations of technical assistance projects, and

design and implementation of ISO 9000 quality management systems.

- Publications (2 most important ones):-
* "Modern Coconut Management" – Food and Agricultural Organization of the United Nations (FAO) 1999 – as co-author (ISBN 1 85339 467X)
* "Coconut Processing Technology Information Documents" in the Asian & Pacific Coconut Community–7 volumes, 1980, as UNIDO Project Manager (UNIDO/ IOD.337, Add.1, 2, 3, 4, 5, 6)

- Clients:-
UNIDO, ILO, FAO/ World Bank, ADB, Danida, CIDA, GTZ, Private, government and cooperative sector in Sri Lanka, Private sector in Australia, Indonesia, Netherlands

- Countries of experience
* South Asia – Sri Lanka, India
* South East Asia – Indonesia, Malaysia, Philippines, Thailand, Vietnam
* Pacific – Fiji, Papua New Guinea, Solomon Islands, Vanuatu, Western Samoa, Tuvalu, Kiribati, Marshall Islands, Truk State of FSM and Yap State of FSM
* Africa – Mozambique, Seychelles, Tanzania, Uganda, Zanzibar,
* Middle East – Lebanon, Yemen
* Far East – Japan

Eng. Edward Walter Karunaratna
Chairman,
Electrical and Electronics Sectional
Committee



**C.Eng., FIE(Sri Lanka),
FIET(London),
MIMech.E.(London)**

Eng. Edward Walter Karunaratna had followed an Engineering Diploma course at the Kingston Technical College, Surrey U.K. He had been elected as a Member of the Institution of Engineers, Sri Lanka in the year 1969, and a Member of The Institution of Mechanical Engineers (London) in 1989. Had obtained the Fellowship of the Institution of Electrical Engineers (London) in 1996. His first appointment in the C.E.B. had been as a Site Engineer, assisting in Contracts, in the

construction of the 132 kv transmission line from Laxapana to Galle, from 1962 to 1963. He had been appointed as the Area Engineer (Ratmalana), handling the operations, maintenance, repairs and the maintenance of the plant and the switchgear equipment, construction of distribution lines and substations and the provision of supply to consumers. The most interesting job he had been entrusted with, by the then General Manager Mr. S.W.Pieris, had been to shift the main primary sub station, facing the Ratmalana Air Port.

In 1969, he had been appointed Regional Project Engineer of the Maskeliya Transmission Project, incharge of 80 miles of 132kv and 200 miles of 33kv Transmission Lines. The contractors of this project had been, M/S Sumitomo Construction Company. Upon completion of the above project in 1972, he had been appointed as Planning Engineer, Western Division. In 1973, he had been selected for a scholarship on A.C. & R. in West Germany. After his return from West Germany, he had been in charge of the

Contd. on page 11...

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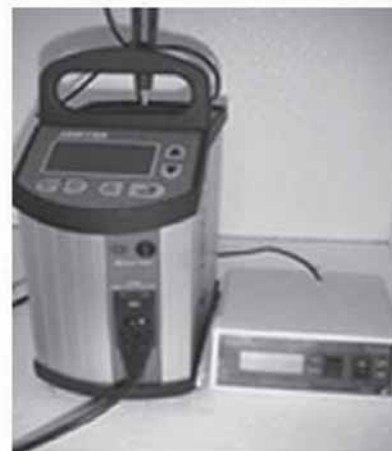
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Sri Lanka Engineering News

Solar Storms!

The modern society relies heavily on technology even for its mere existence. A world without communications and electricity is somewhat unimaginable to us. This over dependence on technology on our part can itself make us very much vulnerable to natural events that can cause irreparable damage to our vital infrastructure. One may say that one single natural incident alone is quite unlikely to cause the total collapse of all the essential systems although a manmade disaster such as an atomic bomb explosion can be quite capable of doing so. The bad news is we may be closer to one such possible event than we would have liked. Solar Storms!

Sun spots occur in cycles of approximately 11 years, the last cycle reaching its climax in the year 2001 and the next cycle expected to reach its peak in the year 2012! Once commenced, a cycle can last for a few years and now we are in the early stages of a new solar cycle that commenced in the year 2010.

Occasionally a sunspot can produce a violent explosion of radiation containing light waves, gamma rays, X-rays and energized particles called Coronal Mass Ejections or CME in short. If a sunspot is facing the earth during the time of a solar flare, CME, depending on their speed, can reach the earth within one to four days, while X-rays which travel at the speed of light, can reach the earth within just about 8 minutes.

The effects of a **strong** solar flare will invariably be felt on the earth, as it could damage the satellites in orbits and could disrupt functioning systems on the ground, the most vulnerable being the electrical grid. Solar storms can induce heavy currents on the power transmission lines making their protection relays to mal-operate tripping the circuit breakers leading to a total collapse of the Grid. In March 1989, a severe geomagnetic storm made the Hydro-Québec's electricity transmission system to fail, the resulting blackout lasting for nearly 9 hours.

The most powerful solar storm that occurred during the last 200 years was in 1859. The storm called "Carrington event" named after the British astronomer Richard Carrington who first reported on it, had set telegraph wires in the US and Europe on fire which subsequently spread out near and far. The flare had been visible even to a naked-eye, and had produced stunning Auroras which extended down towards countries such as Cuba or Hawaii located at tropical latitudes. It is said that Auroras seen over the Rocky Mountains were so bright that their glow woke up the sleeping gold miners, who thinking that morning has dawned had got ready to prepare their breakfast.

If such an event is to occur today, given our dependence for day to day affairs on electrical and communication systems that are interlinked with each other, the results would be catastrophic. However, fortunately, Sri Lanka being an equatorial country, the damaging effects of Solar storms will be less felt by us when compared to those who live in countries located closer to the south and north poles. Yet, as Engineers, it will be our bounden duty to be conscious of all possibilities "under the sun" as nothing can make us react better than preparedness.

Lakshitha Weerasinghe, Editor
lakshitha@iee.org

A Spaceport in Sri Lanka (A comment) by Eng. Kapila Peiris

It was very interesting to read the article related to the above by Eng. Sarath Chandrasiri. I was really keen about the theoretical aspects related to it. But then there was one big short coming. That is related to the inertial frame related to the above. Eng. Sarath Chandrasiri has mentioned many velocities. But what is the frame of reference. In our normal day to day engineering work we consider earth as our inertial frame. But when we go out far from earth it is not possible. Then what is the relevant inertial frame for this spaceport calculations?



Letters to the Editor

Dear Editor SLEN,

This refers to your request to express views on your editorial of SLEN – October 2010 issue.

In the first instance, I could not figure the relevance of the title 'Engineering Courts' With regards to the court cases referred to by you, I believe that the two cases referred to are entirely different from one another. In one case, the person concerned has gone through the judicial system in the country in full. The original court had decided that the person was guilty; the Appeal Court had confirmed it and the Supreme Court had endorsed the fact that the person was guilty. The person concerned had the

opportunity of obtaining 'expert evidence' to justify his actions. I am not aware of the details of the case, to comment on this further. What I meant to place on record is that, the person had every opportunity under the laws of the country to defend himself.

In the second case referred to by you, I have to point out that the facts are totally different. The person concerned has been only charged with some crime. The person concerned has all the facilities of defending himself, according to the laws of the country. He can summon 'expert evidence' in his favour, if there is a need. In the eyes of the law, a person is deemed to be 'not guilty' until he is proven to be guilty by a competent court of law. There has been no finality, even in the trial court. A number of innocent

persons have been charged, and have been found to be 'not guilty' by the courts.

Every person is subject to the laws of the country, whatever discipline he belongs to. If a person's professional work is at stake, he should argue the legality using 'expert evidence'. Irrespective of their disciplines (ex: medicine, engineering, accountancy etc.), and more particularly, state employees are subjected to administrative and financial regulations (AR & FR).

The article appears to be misconceived, and in my view is not relevant in this particular instance. I trust that you will give adequate publicity to my article in the SLEN as well.

Eng. D L Taldena
Past President
10th February 2011.

Standards - Importance in High Voltage Engineering

by Eng. P.H.V.S Kulatilake

Sri Lanka will become a major investment hub in South East Asia within the next two decades.

Reports indicate that various donor countries are pledging to invest huge amount of capital on numerous development projects. These projects may range from developing rural industries, road network, urban development, power network etc. After the completion of these projects the assets will be handed over to the utility owners, or clients to maintain and operate the new additions.

Amongst these multifarious projects, the developing and upgrading of the High Voltage network stands out as the most essential because, primarily energy is required in almost every aspect of daily life. Major transmission projects are already planned to strengthen the electrical grid in line with rapidly increasing energy demand. In order to enjoy the maximum rate of return on the money invested on the HV network, the utility owners (CEB, LECO, LTL etc.) will have to select the best engineering practices especially during the construction stages. Maintaining standards would invariably play a major role in this program.

Standards are required not only in the selection of new equipment but also on

working practices, especially on HV engineering devices due to its sophisticated nature. Safety and reliability play a major role in HV Engineering practices. Hence standards should play a key role from the very outset commencing from equipment selection until the time when it is being taken out from service, right through installation, maintenance and operating practices.

Why standards are needed?

New additions to the HV network will be carried out by various EPC (Engineering Procurement and Construction) companies on turnkey basis with collaboration of engineers within the owners (CEB, LECO, LTL) etc.). Due to the nature of these fast developing phases, the increasing number of EPC companies that sell their products in the open market will come up with dozens of variations to their products if the owners do not specify clearly what their requirements are. These variations introduced by manufacturers might not be compatible with the existing systems resulting in unnecessary expenditure on installations.

It is a known fact that some of the manufacturers and/or EPC companies always attempt to introduce new technologies to the open market. These new

technologies might not essentially be tested or proven on any network for their operability or reliability. In addition, these new innovations might not essentially be the absolute and minimum requirement of the utility owner. A set of properly written standards will help the owner to avoid manufacturers using their network on research and development work.

It is not an easy job to review the tender packages in larger projects. If the scope of the project is not clearly written, the manufacturers or the EPC companies will prepare the tender package incorporating many assumptions. These assumptions may vary from one manufacturer to the other. Therefore standards again will help the owners to compile comprehensive tender requests. The uniqueness of the tender scope written using solid standards will help on evaluating the tenders in a fair manner.

HV utility equipment will serve more than 50 years in any utility. The owners shall select this equipment to serve the network throughout the expected life with fewer failures when proper maintenance practices are used. A set of properly written standards on selection and maintenance of this equipment will serve owners to operate the equipment for longer runs.

Contd. on page 11...



Puzzle No. 37 Swords and Scabbards

A sword made in the shape of a straight line can be smoothly slid in to a straight scabbard. Same applies to a sword and scabbard, both which form parts of a circle of the same radius.

King Dhanurdara of Ramyadeepa was a gifted mathematician as well as a skilled swordsman. He loved swords so much that he got them made in all shapes, sizes and materials possible - even gold. All of them had their matching, smoothly fitting scabbards too.

One day, the King, having got tired of all the straight and circular shaped swords and scabbards that he already possessed in great numbers, announced a prize for anyone who could make a sword and scabbard of a completely different shape. The condition was that the sword should smoothly fit in to the scabbard. Is this possible and if so what would be the shape?

This puzzle is based on an article by Martin Gardner.

Happy Puzzling to All!

Puzzle Guru Eng. Sarath Chandrasiri

Correct answer must be sent by email to ceso@ceb.lk with copies to puzzleguru.lk@gmail.com. Please indicate your name, membership number and date of birth along with the answer. Also indicate the puzzle number in the subject line of the email. The winner will be declared in the April 2011 issue of the SLEN along with the correct answer.

Comments on Eng Kapila Peiris's Solution for the Slinky Dog Puzzle

The only solution received for the extended Slinky Dog puzzle was from Eng Kapila Peiris. On behalf of SLEN I thank him for his solution over which he must have spent a lot of time and effort. However, I find that there are major shortcomings in his analysis as given below.

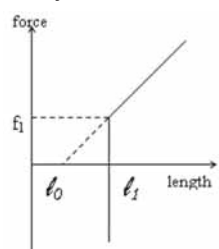
Loosely wound and tightly wound springs behave in different ways. Experiments show that the top end of a loosely wound spring falls with a constant velocity while that of a slinky type tightly wound spring falls with an acceleration greater than g. Eng Kapila Peiris's analysis shows that any spring behaves basically the same way without such differences. This was confirmed by him in our e-mail exchanges on the subject. Despite my comments during these exchanges, he has chosen to ignore the special properties of a slinky spring in his analysis. This is a major omission, which makes his analysis flawed and incomplete.

I would be very happy if Eng Kapila Peiris could provide clarifications and comment on these points. Other readers are also invited to comment and/or send in their own solutions as the puzzle would be kept open for another month. In the meantime, I hope to complete my own solution, which will be published on the closing of the puzzle next month.

Special Properties of a Slinky: Some special properties of a slinky that I could think of are given below

as a help for those who would like to find a solution:

1. A slinky spring has a low K/\bar{m} ratio compared to a normal spring. This makes the wave propagation speed very much lower than in a normal spring. In fact it is so low that slinkies are used to demonstrate the propagation of longitudinal as well as transverse waves in class rooms, because the students can easily see how a wave slowly travels along the slinky.



1. A slinky is a weak spring with a certain amount of pretension. What we mean by pretension is that in the absence of any external forces, the coils would come together and it will form something akin to a rigid body, with the coils pressing on each other with a finite compressive force. In order to separate a coil from the adjoining one, a certain amount of force has to be



Any theory should explain such observed behaviour of a slinky.

Keep on Puzzling!!!

Puzzle Guru Sarath Chandrasiri

Contd. on page 11...

Solution for 'Slinky Dog' puzzle By Eng. Kapila Peiris

Length of the spring at this state is 'L', spring constant is 'K' mass of tail of 'dog' is 'm', mass of unit length of spring = ρ mass of head of dog is 'M'

Figure (1-6) shows the spring when it is hanging by its tail. In this 'hanging' state (the spring is stretched downwards) a small length δx of the spring having a mass ' δm ' is at 'x' distance 'm' (x is measured in normal condition, i.e. without any stretching/compressing) in the downward direction from 'm', will be displaced downwards by $u(x)$. If we consider the linear density of spring at normal condition is ' ρ ' then

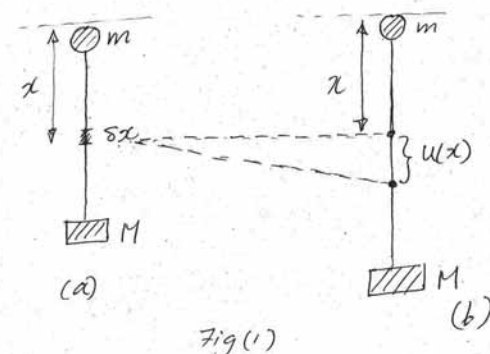
$$\text{strain at } \delta m \text{ is } \frac{\partial u(x)}{\partial x}$$

$$\text{Tension at } \delta m \text{ is } \frac{K \partial u(x)}{\partial x}$$

$$\therefore \frac{K \partial u(x)}{\partial x} = (L-x)\rho g + Mg, \text{ (weight below 'x')}$$

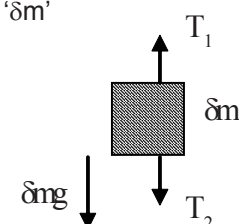
$$\therefore \text{Displacement at 'x' } = U(x) = \int_0^x \frac{\rho g}{k} (L-x) + \frac{Mg}{k}$$

$$U(x) = \frac{\rho g}{k} \left[Lx - \frac{x^2}{2} \right] + \frac{Mgx}{k} \quad \text{---(1)}$$



Now when the spring is released let us apply $P=mf$ in downward direction to mass ' δm '

Forces on ' δm '



T_1 = Tension force from upper end

T_2 = Tension force from lower end

now $T_1 =$

$$= \frac{K \partial u(x, t)}{\partial x}$$

$$T_2 = \frac{K \partial u(x, t)}{\partial x} + \frac{K \partial^2 u(x, t)}{\partial x^2} \cdot \delta x$$

\therefore Total downward force on ' δm '

$$= \frac{K \partial^2 u(x, t)}{\partial x^2} \cdot \delta x + \delta mg$$

$$= \frac{K \partial^2 u(x, t)}{\partial x^2} \cdot \delta x + \delta x \rho g$$

\therefore applying $p = mf$

$$\frac{K \partial^2 u(x, t)}{\partial x^2} \cdot \delta x + \delta x \rho g = \delta mf$$

Contd. on page 10...

SOLUTION FOR PUZZLE - 33 COLOUR OF FLOWERS

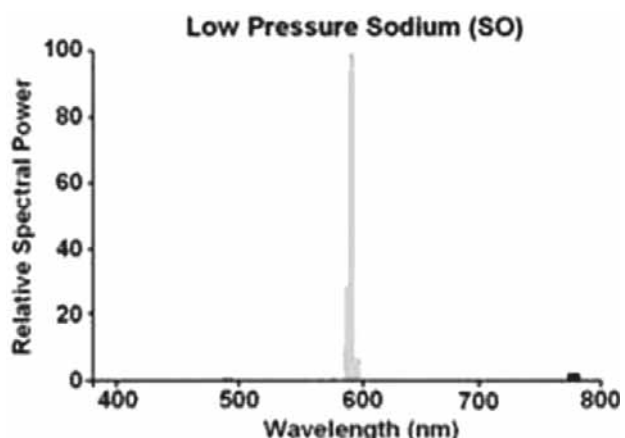
Out of the three solutions received, two were detailed but slightly different from each other. As I was unable to decide which the better solution is, I sought the help of the puzzle originator Eng DNO Mendis's (FIESL). His response was as follows:

Thanks for the solutions received. My intention was to find out how much our engineers know about illumination. Solution from Engineer P.A.Sampath Kumara Pathirananarachchi is correct. He has spent a lot of time and effort on it. Look out for another true life puzzle in the near future!- Neil

Therefore, the prize this month goes to Associate Member P.A Sampath Kumara Pathirananarachchi (A/M 10571), who is also the youngest member to have sent in a solution. His solution is given below:

Answer: Black color was the flower color in the night.

Explanation : Sodium Vapor Street Lamps emits monochromatic yellow color. Below is Spectrum of a low-pressure sodium lamp. It is obvious that almost no other visible colors are emitted by this kind of lamps.



Human eye "sees" objects from light reflected, emitted or transmitted by them when enter in to eye. An object's color is determined based on the wavelength (or frequency) of the light wave.

In this flower case, the color of the flower is blue in the day time since it is the only color reflected by that flower (during the day time where full light spectrum is available received from the sun) while the rest of light spectrum is absorbed.

During the night time, the only light source is sodium vapor lamp which emits monochromatic yellow which is fully absorbed by the flower; hence there is no reflected light wave component to "see" from human eye. If no visible spectrum of color is reflected, emitted or transmitted, it is seen as black object.

(Ref: http://en.wikipedia.org/wiki/Color_vision, <http://www.answers.com/topic/sodium-vapor-lamp>)

P.A Sampath Kumara Pathirananarachchi (A/M 10571)

Another detailed and almost identical solution was received from Prof PGR.Dharmaratne (F-774) and a third correct solution was received from Associate Member C.A.D. Matararachchi (AM-6883). We thank both of them for their solutions.

I also thank Neil for sending in this interesting puzzle and hope that he would be sending in the next puzzle soon.

Puzzle Guru Sarath Chandrasiri

Induction & Graduation Ceremony 2011

**The Induction and Graduation
Ceremony for the year 2011
will be held on August 19, 2011
at the BMICH, Colombo.**

BACK TO BASICS

REACTIVE POWER -11 TRANSMISSION LINES

By Sarath Chandrasiri

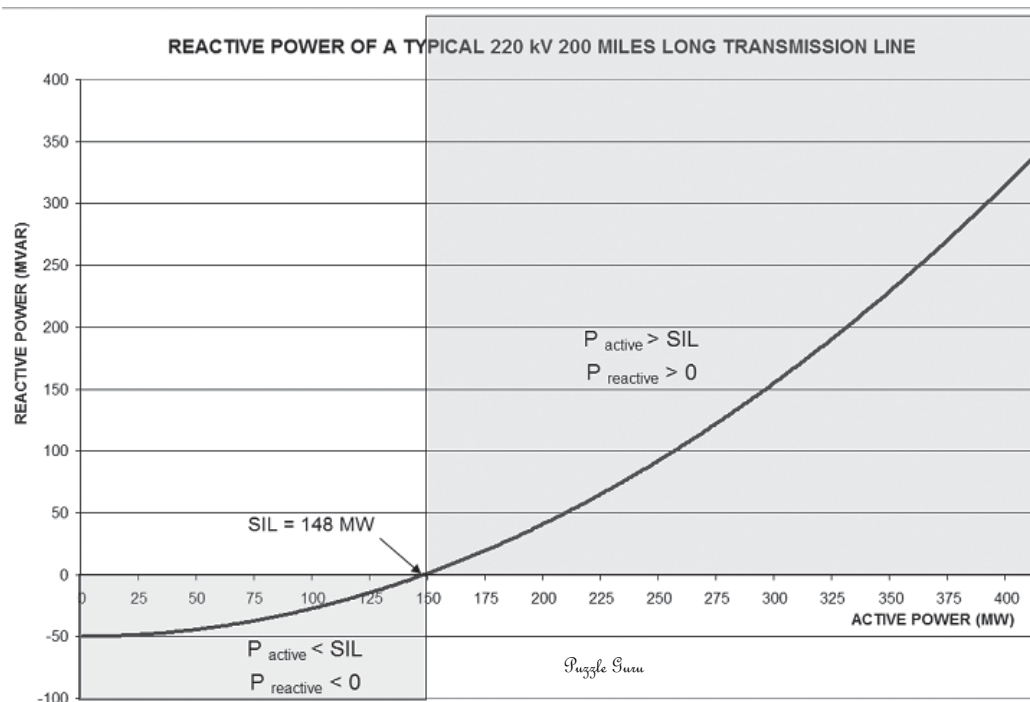
Transmission lines do not produce any active power, which forms the real life blood of a power system. Their role is to transport power from places where generating sources are located to places where consuming points are located. HV transmission lines do this efficiently, economically and reliably. In this process, the transmission line consumes some of the active power but it is a reasonable price that we pay for their role.

Let us see how a transmission line behaves when the Active Power sent through it is increased from zero to the maximum possible value. The MVAR vs. MW curve below is plotted for a 200 mile long 220 kV Transmission line. These values have been selected as they would be similar to something like a Sapugaskanda/Jaffna transmission line. The values used for the distributed inductances and capacitances per unit length of line may not be correct but the idea here is to illustrate the principle.

The curve has been drawn assuming that the transmission line has been terminated at the receiving end with an active power load, a pure resistance. Load variations can be considered as variations in the value of this resistance. Thus any reactive power flows are due to the inductive and capacitive parameters of the transmission line only, which is assumed to have a negligible resistance per unit length.

Of great interest would be the point where the curve crosses the x-axis, which is called the (Surge Impedance Load) SIL point. At this point, the reactive power consumed by the inductance of the transmission line would be exactly compensated by the capacitive reactive power consumed by it. Thus we can think of two regions in the curve defined by the SIL.

1. Region where $P_{active} < SIL$. In this region, the sending end reactive power, $P_{reactive} < 0$. The transmission line acts as a reactive power source (a capacitance).
2. Region where $P_{active} > SIL$. In this region, $P_{reactive} > 0$. The transmission line acts as a reactive power sink (an inductance).

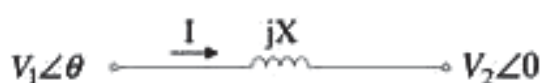


The Surge Impedance $Z_c = \sqrt{L/C}$, where L and C are the above mentioned distributed inductance and capacitance values of the transmission line. Z_c has the units of ohms and is a pure resistance. When you terminate the line with a load equal to SIL, the sending end power factor will be unity irrespective of the length of the transmission line.

The Heart of the Problem:

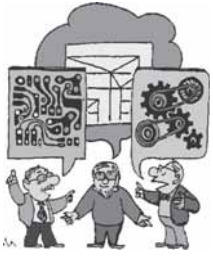
From the curve given above, it can be seen that in order to double the active power from 150 to 300 MW (an increase of 150 MW), the reactive power has to be increased by 150 MVAR. Similarly to increase active power from 300 to 400 MW (an increase of 100 MW), the reactive power has to be increased by another 150 MVAR. The situation becomes worse as we go to higher and higher power transfer levels. Putting it mathematically, the required $\Delta MVAR/\Delta MW$ increases with increasing MW. That, we can say, is the heart of the problem.

In the diagram below the transmission line has been replaced by a simple series inductance. It is a reasonable assumption we can make under fairly high loading conditions. As shown above a transmission line behaves as a capacitance when it is lightly loaded and as an inductance when it is heavily loaded. Here the terms light and heavy are defined by SIL. Under heavily loaded conditions, to increase the power transfer level, the series reactance has to be decreased or the voltages have to be increased as seen from the following equations:



Contd. on page 10...

THE LIGHTER SIDE OF OUR PROFESSION



Nothing Engineering about it!

“ A lesson on Starter Motors ”

Contributed by Eng.Sarath Chandrasiri

All who have been at the E-Fac in the sixties would remember the light blue Standard station wagon that Professor Paul used. At one time the starting motor of this vehicle instead of getting the engine started, started giving trouble. As the problem was becoming an increasing nuisance, he finally handed it over to a Garage in Peradeniya for repairs. Mr. Somapala (The lab assistant that we all lovingly remember) drove the Professor to the Garage the next day to collect the car and there he overheard the following conversation.

Professor: කියද බාස් උන්තැහේ ගාන? (How much do I owe you?)

Electric Baas: රුපියල් 50 යි මහත්තයා (Rs 50 Sir).

Those days Rs 50 was a hefty amount that could be hardly afforded even by a Professor.

Professor: ඇයි එව්වර? මෝටර්ට මොකද වෙලා තිබුනේ? (Why so much? What was wrong with the motor?)

Now the baas, who was an excellent automotive electrician, was getting annoyed. Not knowing he was in the presence of a Professor of electrical engineering, he flared up.

Electric Baas (somewhat annoyed): (තරමක් තදවි). මහත්තයාට මෝටර් ගැන කියා දෙන මට වෙලාවක් නෑ. කැමති ගානක් ගෙල කාරෙක අරං යන එකයි ඇත්තේ. (Sir, I don't have time to teach you about motors. Pay what you like and take your car away.) Professor paid the man Rs 50 and drove away without a word.

Note to Readers

Prof R.H.Paul is regarded as the Father of Electrical Engineering in Sri Lanka

THE INSTITUTION OF ENGINEERS, SRI LANKA

120/15, Wijerama Mawatha, Colombo 7.

Tel. 0112 698426 - 209, 210, 211 Fax : 011 2 699202, E-mail : deetiesl@sltnet.lk



CONTINUING PROFESSIONAL DEVELOPMENT (CPD) COURSES FOR THE SESSION – 2011

REGISTRATION FORM

Those who wish to follow the courses indicated below, please perfect this form and return the same to the IESL. Please mark “X” in the cage against the interested course/courses. The date of commencement of the course will be informed to you in due course.

Director - (EE&T), IESL.

Name:

Postal Address:

Membership No E-Mail:

Telephone (Office) (Residence)

Mobile:

Course	Duration	Course Fee (subject to change)	Pl. mark "X"
Effective Communication	100 hrs	Rs.17,500/-	
Design of Electrical Installation	07 Saturdays	Rs.25,000/- Rs.27,000/-	
Speechcraft Programme	10 Tuesdays from 1700 - 1900 hrs	Rs.10,000/- Rs.12,000/-	
Project Management Professional Training	06 Saturdays from 0900-1600 hrs	Rs.15,000/- Rs.16,000/-	
Management Development for Engineers - 40th Series	12 Saturdays from 0900- 1600 hrs	Rs.24,000/- Rs.25,000	
Procurement Planning	One day	Rs.4,000/- Rs.5,000/-	
Safety & Health Management	10 half days	Rs.12,000/- Rs.14,000/-	
Quality Assurance in Welding	05 Saturdays from 0900 - 1600 hrs	Rs.18,000/- Rs.20,000/-	
Accounting for Engineers	02 days from 0900 - 1600 hrs	Rs.7,000/- Rs.9,000/-	
Highway Engineering	06 Saturdays from 0900-1600 hrs	Rs.18,000/- Rs.19,000/-	
Basic Air Conditioning Systems Design	06 Saturdays from 0900-1600 hrs	Rs.17,000/- Rs.19,000	
Code of Ethics	One day	Rs.1,000/-	
Bid Evaluation	One day	Rs.4,000/- Rs.5,000/-	
Nanotechnology	One day seminar	Rs.4,000/- Rs.5,000/-	

Signature: Date:

Eng (Prof) R H Paul Memorial Lecture in pictures



Eng. (Prof.) A K W Jayawardane, President IESL garlanding the photograph of late Eng. (Prof.) R H Paul



Head table from left to right, Eng. E W Karunaratna, Chairman, Electrical Engineering Sectional Committee, Eng. (Prof.) A K W Jayawardane, President, IESL, Lecturer, Eng. (Dr). Tilak Siyambalapitiya, (Energy Consultant)



Eng. (Prof.) A K W Jayawardane, President, IESL delivering his address



The lecturer, Eng. (Dr). Tilak Siyambalapitiya, (Energy Consultant), delivering his lecture.



The audience, including the late Prof. Paul's family members

Two Schoolboy Innovators to compete at Intel ISEF 2011, in Los Angeles

by Rohan Mathes

Master T.S. Thilakarathna of Ananda College Colombo and Master Aruna Prasad Keerthirathne of Vidyarthi College Kandy, will represent their Motherland at the Intel International Science and Engineering Fair (ISEF) 2011, scheduled to be held in Los Angeles, USA, from May 8 to 13, later this year.

The projects titled "Live Multifunctional LPT Controlling Software" presented by Master T.S. Thilakarathna and "Drill Press With Laser Cone Centering Device", by Master Aruna Prasad Keerthirathna at the Sri Lanka Science and Engineering Fair (SLSEF) 2011, enabled them to win and qualify for this prestigious global event at the picturesque Los Angeles in United States of America.

The two individual projects were presented to the SLSEF, via the Junior Inventor of the Year (JIY) competition organized by the Institution of Engineers, Sri Lanka (IESL), last year.

The Intel ISEF provides a window of opportunity for the crème of the world's young scientists and innovators to get together and share their views and concepts, and show case their 'cutting edge' science and engineering projects, to win awards and scholarships.

Intel Corporation of USA will sponsor the travel and the accommodation of the two students.



Certificate Awarding Ceremony of Continuing Professional Development (CPD) Courses - 2010



Participants receiving their certificates from the IESL President, Eng. (Prof.) A K W Jayawardane



One of the participant receiving her certificate from the President Elect, Eng. Ananda Ranasinghe

Collection of IAHS Publications at the Library of the University of Moratuwa

The University of Moratuwa library has an extensive and valuable collection of books, periodicals, standards, and e resources especially on Engineering, Architecture and IT. In addition, the library also provides facilities to enhance learning, teaching and research activities with its special collections. Accordingly, the Library has developed a special collection on Hydrological Sciences with assistance from the Task Force for Developing Countries (TFDC) of the International Association of Hydrological Sciences (IAHS). This is in addition to the vast selection of other publications available on Water Resources Engineering.

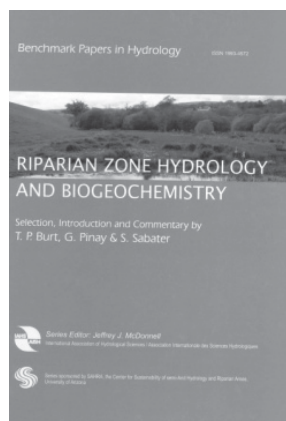
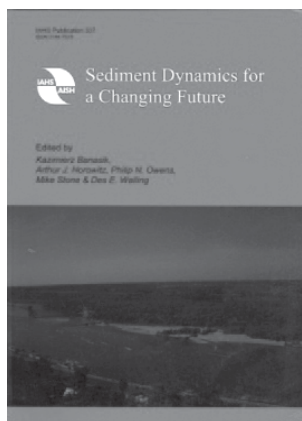
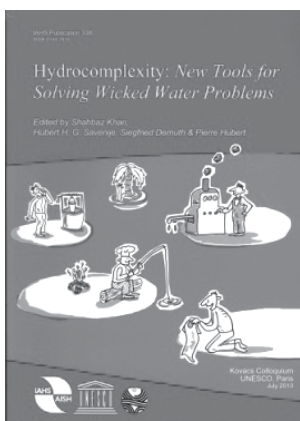
The Library is pleased to inform that it has decided to expand access to its resources and invites scientists, engineers, researchers and other professionals to make use of this valuable collection.

For further information contact:

Mr. Anura Kiriella
(Assistant Librarian)
Tel : 2650301 (Ext: 1506)
Email : anurap@lib.mrt.ac.lk

Following are some titles of the collection;

- Riparian zone hydrology and biogeochemistry
- Sediment dynamics for a changing future
- Hydro complexity: New tools for solving wicked water problems
- Global change: Facing risks and threats to water resources



TO ALL ADJUDICATORS

AVAILABILITY OF EXPERT SERVICES FROM THE IESL

The Institution of Engineers, Sri Lanka (IESL), which has on its roll, the experts of the country belonging to all fields of Engineering, is in a position to provide assistance to an Adjudicator, when the latter is confronted with a dispute in a field in which he is not an expert.

These expert fields may be broadly categorized as follows:-

1. Agriculture and Plantation Engineering
2. Building Services Engineering
3. Chemical Engineering
4. Civil Engineering
5. Electrical and Electronic Engineering
6. IT and Communication Engineering
7. Mechanical Engineering
8. Interpretation of Conditions of Contract
9. Application of Law governing the Contract.

In this regard, the IESL wishes to inform Adjudicators that with the consent of the disputing parties, an Adjudicator, when confronted with a dispute in which he does not have the necessary expertise, may contact the Arbitrators and Adjudicators registered with the IESL, for any assistance.

The names of the Arbitrators and Adjudicators of the IESL are listed on its website.

EXECUTIVE SECRETARY

PROVINCIAL NEWS

ANNUAL GENERAL MEETING OF THE IESL WAYAMBA CENTRE

Annual General Meeting of IESL wayamba centre was held on 12 November 2010 at Seasons Hotel Kurunegala with the presence of around 100 engineers who represented various institutions in the state sector and the private sector.

AGM was commenced at 17.00 hrs. Addressing the meeting, outgoing chairperson Eng. Mangala Tennakoon appreciated the participation of members to the AGM as a great encouragement and highlighted the mutual benefits of engaging IESL Wayamba Centre activities for the centre as well as members. Further, she conveyed sincere thanks to the outgoing committee, which played its role very effectively, understanding the responsibility and admired the guidance of past chairmen. Then chairperson recalled the activities carried out and the achievements gained during the year 2000/2010. She mentioned the five presentations, one full day seminar, a preparatory workshop for professional review examination and a filed trip and family get-together organized by the centre. In addition, donation of a refrigerator with the contribution of many members to Dingiri amma elders home was recorded as the first social event accomplished by the centre.

Then the house moved towards adopting the minutes of the previous Annual General Meeting, which was held on 31st October 2009. The senior secretary announced that the minutes has been distributed along with the Annual Report, among the members and if amendment is necessary, requested to highlight it. The minutes were adopted without any amendment, proposed by Eng. Chithra Nissanka, and seconded by Eng. SMB Dissanayake. The Annual financial statement also had been distributed and was adopted as in order, proposed by Eng. Presad Ratnayake and seconded by Eng. W. Hunukumbura.

Eng. Chithra Nissanka proposed Eng. Gamini Senanayake as the retaining officer, once the existing committee withdrawn, allowing select the office bearers for the session 2010/2011. Then Eng. Gamini Senanayake mentioned about the great tradition of IESL Wayamba centre and with the consent of house, requested Outgoing Chairperson Eng. Mangala Tennakoon to propose names for the committee with her experience. After presenting the suggested list to the house, retaining officer invited volunteers to join the committee. Accordingly, six more engineers volunteered to join the committee showing their enthusiasm. After that, tabled the list of names as the committee members, following the grooming process introduced at IESL Wayamba Centre.

Eng. Bandula Witharama, the newly elected Chairman addressed the gathering. In his speech while thanking the general membership for selecting him as the Chairman for the year 2010/2011 appreciated the out going chairperson and committee for the contribution made for the benefit of centre during the last session.

Then Eng. Bandula Witharama briefed on the activities he has planned to carryout during the session 2010/2011.

- To develop the IESL Wayamba Centre Website and link it to the IESL HQ Website.
- Update the database of Members, with regular updates.
- Increasing the number of members of the centre. Member support is needed to carry out this activity successfully.
- To obtain suitable our own Office Premises for the Centre. The support of past chairmen is needed for this.
- To conduct ExCo Events, Meetings and Field Visits according to a plan.

The new office bearers for the session 2010/ 2011 as follows;

Chairman	Eng. Bandula Witharama DGM (North Western/ North Central) Sri Lanka Telecom, Kurunegala
Vice Chairman	Eng. R.A.H. Rajamanthri Addl. Director, NWP Engineering Department Provincial Council Complex Kurunegala
Senior Secretary	Eng. Prasad Ratnayake Chief Engineer Ceylon Electricity Board Chilaw
Joint Secretary	Eng. S. N. Jayasinghe Executive Engineer, Executive Engineer's Office Anamadawa
Joint Secretary	Eng. Saman Piyasinghe Regional Telecom Manager Sri Lanka Telecom, Kandy Road, Kurunegala
Treasurer	Eng. S.M.B. Dissanayake Engineer, Municipal Council, Kurunegala
Assistant Treasurer	Eng. M.D.K. Mahiti Engineer, District Secretariat Kurunegala
Editor & Web Master	Eng. Krishantha Ranawake Engineer, Sri Lanka Telecom Kurunegala

Contd. on page 10..

CHEMICAL ENGINEER

We have an immediate vacancy in our permanent cadre for a Chemical Engineer to strengthen our Technical Team.

We are an ISO 9001:2008 certified company, marketing world class Specialised Construction Chemicals, which include Concrete Admixtures, Structural Grouts, Waterproofing Products, Industrial Flooring, Geosynthetics, Gabions and other products for the Construction Industry. Our Contracts Division functions as a Specialised Contractor in the fields of Concrete Repair, Grouting, Waterproofing, Wear Resistant and Hygienic Flooring, as well as design and erection of Gabion Structures.

The selected candidate should have the ability of identifying production processes and co-ordinate unit processes, carry out quality control, knowledge of process industries, safety and health practices and environmental energy management.

Educational Qualification:

Requirement is a B.Sc in Chemical Engineering from a University in Sri Lanka with a minimum experience of 2 years.

Salary is negotiable, A medical scheme is also on offer.

Please forward your Bio - Data,



**Group Director HRD
Finco (PVT) Limited**

49/16, Galle Road
COLOMBO 03

E-mail: grouphrd@fincogroup.com

Contd. from page 9...

PROVINCIAL NEWS



Retaining officer Eng. Gamaini Senanayake reading the names of new committee members, A few members of the new committee are in the background.



President, IESL Eng. (Prof.) Ananda Jayawardane addressing the Annual Session of IESL Wayamba Centre.



New Chairman Eng. Bandula Witharama presenting a token of appreciation the out going Chairperson Eng. Mangala Tennakoon

ANNUAL GENERAL....

The Chairman concluded his speech by requesting the membership to be in constant touch with the Executive Committee, and also asking for their fullest support to carry out the Centre activities successfully during the coming year.

Since there was no any suggestion or any other matter to discuss, the Annual General Meeting was concluded around 18.00 Hrs after the vote of thanks delivered by Joint Secretary Eng. Saman Piyasinghe..

The participants were then invited to attend the Technical Session, which was graced by the President IESL, Eng. (Prof.) Ananda Jayawardana and invitees from the other provincial centres.

Technical Session was accomplished very successfully. As guest speaker Eng. Priyantha Undugodage, Vice President, Dialog Axiata Pvt. Ltd delivered a presentation on "The Future Internet Lifestyle". Then chief guest President, Eng. (Prof.) Ananda Jayawardana inspired the gathering by delivering the speech. The session was followed by the cocktail dinner co - sponsored by M/S Vinseth Engineering (Pvt) Ltd., M/s LTL Holding (Pvt) Ltd. and M/s SL.A. Traders.

Reported By Editor, IESL (Wayamba)

Contd. from page 6 ...

REACTIVE

If $R = 0$, then $Z = jX$, $\theta = 90^\circ$, and

$$P_s = \frac{|V_s| |V_r|}{|X|} \sin \delta$$

$$Q_s = \frac{|V_s|}{|X|} (|V_s| - |V_r| \cos \delta)$$

Further, if δ is small, $\sin \delta \cong \delta$ and $\cos \delta \cong 1$, so

$$P_s \cong \frac{|V_s| |V_r|}{|X|} \delta$$

$$Q_s \cong \frac{|V_s|}{|X|} (|V_s| - |V_r|)$$

- The active power depends mainly on the phase angle difference between the sending end receiving end voltages.
- Reactive power depends on the magnitude difference between the same voltages.

In order to illustrate the fact that voltage instability is not exclusively related to reactive power, consider the DC case given below, where reactive power is completely absent. A DC source of voltage V with an internal resistance R_i is feeding a load resistance R_L . The power in the resistor is automatically adjusted by a

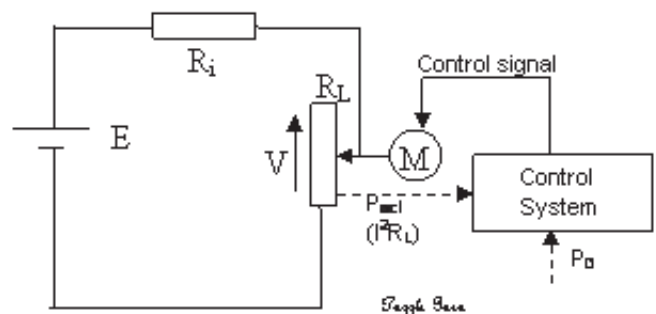
control device, which operates a motor that adjusts the slider position on the load resistor. The control device has a set point P_0 and its purpose is to keep the power dissipated in R_L equal to P_0 by adjusting the slider in accordance with the algorithm: $dR_L/dt = I^2 R_L - P_0$

As we know, the maximum power P_{max} in R_L occurs when $R_L = R$ and $P_{max} = E^2/4 R_i$. If the set point $P_0 < P_{max}$ the system would work fine. But if $P_0 > P_{max}$ the slider will keep on moving to decrease the resistance and reach the minimum point with V and $I^2 R_L$ collapsing to zero. The voltage instability in this simple system has much in common with the same phenomenon observed in power systems. The existence of reactive power in a power system makes things much more complicated but it is not the only source of the problem.

To be Continued...

Q-V Dependency:

It is well known that in power systems dominated by reactances (as found in Sri Lanka) the system voltage levels are closely dependent on MVAR flows. However, this dependence should not be over emphasized since both MW and MVAR flows play major roles in voltage stability.



* g = acceleration due to gravity

Contd. from page 5...

Solution for 'Slinky Dog'....

f = acceleration 'δm' (downwards)

$$\text{also } f = \frac{\partial^2 u(x,t)}{\partial t^2}$$

$$\therefore \frac{K \partial^2 u(x,t)}{\partial x^2} \cdot \delta x + \delta x \rho g = \delta x \rho \frac{\partial^2 u(x,t)}{\partial t^2}$$

$$\therefore \frac{K \partial^2 u(x,t)}{\partial x^2} = \rho \frac{\partial^2 u(x,t)}{\partial t^2} - \rho g \quad \text{--- (2)}$$

* After releasing 'U' is a function of its position (x) and time (t) therefore

$$U = U(x,t)$$

Now let us consider two functions $U_1(x,t)$ & $U_2(x,t)$

$$U_1 = \frac{\rho g}{k} [Lx - \frac{x^2}{2}] + \frac{Mgx}{k}$$

$$U_2 = f(x-ct), C = \sqrt{\frac{k}{\rho}}$$

Now U_1 will satisfy equation (2) also $U_1 + U_2$ will satisfy equation (2)

$f(x-ct)$ is a propagating function at speed, $C = \sqrt{\frac{k}{\rho}}$

Now $U_1 =$ equation (1), displacements at $t = 0$ (before releasing)

Now when the spring is released from tail (mass 'm') displacements of the spring at lower end (with head 'M') will obey 'U₁' and upper part (with tail mass 'm') will obey 'U₂', now because 'U₂' is a propagating function it will 'move' downwards until then lower part will obey 'U₁'

now

$$U_1 = \frac{\rho g}{k} [Lx - \frac{x^2}{2}] + \frac{Mgx}{k}$$

$\therefore U_1$ is independent of time 't', hence displacements will not change with time (t). Therefore lower part of the spring with head will remain stationary until 'U₂' reach it.

note strain at $x = L$

$$= \left(\frac{\partial u_1}{\partial x} \right)_{x=L} = \frac{Mg}{k}$$

\therefore tension at $x = L =$

$$\frac{k \partial u_1}{\partial x} = Mg$$

\therefore head also will remain stationary until 'U₂' reach it.

THE INSTITUTION OF
ENGINEERS, SRI LANKA



Competition
on

"Eco Efficient Water
Infrastructure for
Sustainable Development"
Session 2010/2011

Sponsored by

St. Anthony's Industries
Group (Private) Ltd.

(MANUFACTURES OF ANTON PVC PIPES
AND FITTINGS)

Two competitions will be held this year for the award of certificates and cash prizes. The competition soliciting original Technical Papers on research and case studies are accepted from members of IESL who are above 35 years.

There will also be another competition for members who are 35 years and below on **01 October 2011**. This competition is open to members of IESL and final year students of Faculties of Engineering of Universities in Sri Lanka who are student members of IESL or who obtain such membership before submitting their technical papers.

AWARDS & PRIZES

ABOVE 35 YEARS ON 2011.10.01

- First Prize - Rs. 50,000/=**
Second Prize - Rs. 25,000/=
Third Prize - Rs. 10,000/=

35 YEARS AND BELOW ON 2011.10.01

- First Prize - Rs. 25,000/=**
Second Prize - Rs. 15,000/=
Third Prize - Rs. 5,000/=

The members (Fellows, Members, Associate Members, Associates, Companions and Students) who wish to participate must obtain the application forms from IESL and **submit bio data & full Technical Papers** to reach the Executive Secretary, Institution of Engineers Sri Lanka, No. 120/15, Wijerama Mawatha, Colombo 07 **on or before 30th April 2011**.

Further information could be obtained from the Chairman, Steering Committee on Water Resources Development of The Institution of Engineers, Sri Lanka, on Tel: 011-2685490, 011-2698426 or 011-2699210.

ext- 207, E-mail:
ed@sltnet.lk,
iesl@slt.lk,
Fax : 011-2699202



Contd. from page 5...

Comments on Eng Kapila.....

and a small block held close to it but not attached to it. The frames are taken at equal time intervals. Thus, the parabolic nature of the curve traced by the slab as well as that of the free block show that they are moving with some acceleration. Since the curve traced by the slab (top end of the spring) is steeper than that of the block, we can conclude that it is moving with an acceleration greater than g , which is the acceleration of the free falling slab.

Contd. from page 4...

Standards - Importance...

There is a significant reduction on requirement for HV Engineering jobs throughout the world. New comers to the industry will not possess the necessary experience on operating or maintaining such equipment. It is well known that the owners have not developed any training tools for the new comers for last decade. Standards will serve the new comers to the industry as a better training tool.

There is a drastic difference between HV Engineering and other Engineering domains, as HV Engineering involves an extremely high safety factor and serves as an essential commodity in any infrastructure. Working in HV network is a highly specialized job as one error would result not only equipment failure but injuries or even a fatality. Written Working Guide Lines or Standard Working Practices on HV network are absolutely essential for the owners.

In accepting the completed work after commissioning the major schemes, equipment is an important part of any project. The owners should have a recognized yard stick at this time to make sure the new additions are designed, installed and commissioned to an acceptable level. A set of properly written standards should be adhered to, on how to accept the finished product and what level of completion are required so as to avoid unnecessary friction with the contractors.

Specifying a product according to common international standards (IEEE, IEC, BS, etc.) might not be adequate especially on HV equipment. The same international standards which could be applied in one country might not work fully in another country. Different working practices, different environment conditions and different testing methods may vary from country to country. Hence having a set of standards according to the local conditions will be very useful.

How and where to start,

Specification and standards are two different tools used by any engineering utility. Specifications are written specially on products and equipment purchased on various phases of the project. Standards are slightly different to specifications as those are written specially on process and practices. Those may be written on designing, installation, maintenance and operating of various schemes, practices. Writing a specification needs some experience but it is not that difficult; however, writing a standard is a specialized task and needs highly competent knowledge about the subject and years of experience.

Owners first shall identify where the standards are needed, and what areas are important. As an example, design drawings of grid substations play a major role on maintaining the HV

equipment throughout longer periods. If the facility owners do not have a proper set of standards on their drawings, the manufacturers will come up with various methods to illustrate the same scheme.

Non-availability of commissioning/acceptance standards is another area to focus upon. Generally any project will have an important exercise at the end of the project to accept the new additions for operations and maintenance. The payments to the construction companies for the projects undertaken will be made based on the completeness of the new additions. A set of well written standards to accept the new additions will serve to ensure that no friction occurs over the acceptance.

It will be a difficult task to implement the new standards, if the owners have not indentified the importance of the standards. It is hard again to implement the standards if the same had not been used for longer periods in the past. Appointing a committee comprising experienced professionals from all connected fields within the industry would be required for initiating this task.

(The author of this article is a Chartered Electrical Engineer formerly of the CEB, now working in the power transmission company in the Alberta Province, Canada as a Senior Project Engineer).

Contd. from page 3... **Meet your Council .. Eng. Edward Walter....**

Airconditioning and Refrigeration branch which had been handling the installation of new A.C. & R Plants and also carried out repairs and maintenance of all the plants scattered through out the country. In 1983, he had been appointed as the Divisional Manager in charge of Colombo City and subsequently upgraded to Deputy General Manager level, responsible for providing the Colombo City consumers with a reliable supply of Electricity.

The final phase of his carrier in the C.E.B had started in 199, when he had been appointed as the Additional General Manager, in charge of human resources development, personnel administration, education and training of C.E.B. employees. In 1994, he had handed over his retirement papers to the General Manager of the C.E.B. In the same year, he had been appointed as a Consultant, to advise the C.E.B. on foreign funded transmission and distribution projects.

In 1996, he had been appointed as a Director to the Board of Directors of the Ceylon Electricity Board.

In 1998, he had set up his own Consultancy and Engineering Company V.I.Z. E.M.P. Engineering Services. He had participated in lectures, seminars and conferences conducted by the I.E.E. (Sri Lanka branch) I.Mech.E.(Sri Lanka branch) and the Institution of Engineers, Sri Lanka.

He had taken part in community and charity work in a number of local organisations engaged in education and welfare for the poor families. He had also been a member of Sports Bodies, including Table Tennis, in Sri Lanka.

Contd. from page 3... **Eng (Prof.) S. L. J. Wijeyekoon....**

Engineering at University of Moratuwa. Prof. Wijeyekoon is a Monbusho Scholar, Japan Society for the Promotion of Science (JSPS) Fellow and a Commonwealth Fellow. As Chairman of the Chemical Engineering sectional committee in 2008/2009 and 2010/2011, he has been a Council Member of IESL.

His other contributions to committees, institutions and Ministries include: Steering Committee member of the National Cleaner Production Program of the Ministry of Industrial Development, Member of the National Steering Committee formed by the Ministry of Constitutional Affairs and Industrial Development on Integration of Cleaner Production into Industrial Development of Sri Lanka, Member of the Visiting Lecturer panel at the Sri Lanka Institutional Development Agency (SLIDA), Technical evaluation committee member of the environmental impact assessment report evaluation of the proposed Kandy city waste water disposal project, for project approving authority the Central Environmental Authority, Local Consultant for Central Environmental Authority for the project Hazardous Waste Regulation Implementation, National Consultant for Energy Projects to the Designated National Authority on Clean Development Mechanism, a project funded by the World Bank for Global Affairs Division of the Ministry of Environment and Natural Resources, Member, Joint Coordinating Committee of the Ministry of Environment for the "Project for Capacity Development of CDM Promotion in Sri Lanka" funded by JAICA, Team Leader - Environmental Impact Assessment (EIA) for the Commissioning of Sterilizers (Autoclaves) to Sterilize Health Care Waste Generated within the Colombo Municipal Council (CMC) Area by Ministry of Health Administered Institutions, Technical Expert for Sri Lanka Standards Institution in ISO 14001 audits etc.

Prof. Wijeyekoon is also actively involved in promotion of Cleaner production with National Cleaner production Centre, Sri Lanka and serves as member of number committees at the Faculty of Engineering and University of Moratuwa and Staff Advisor, Nature Team, University of Moratuwa.

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