



IEI - TLC - NEWS

IN-HOUSE NEWS LETTER OF
THE INSTITUTION OF ENGINEERS (INDIA)

TIRUCHIRAPPALLI LOCAL CENTRE

www.ieitiruchi.org



Issue No. 2017/05-06

CHAIRMAN: Er. R. SELVARAJ, FIE

HON. SECRETARY: Er. S. LAKSHMANAN, MIE

CHAIRMAN SPEAKS.....



Dear Engineers,

Warm & Best Greetings to all.

Very happy to meet all of you through our IEI-TLC E Newsletter.

It is a great pleasure for me to appreciate that the editorial team of IEI-Tiruchirappalli Local Centre in bringing out the fourth issue by taking lot of initiatives

From April 2017, so far we have conducted & covered the following 12 Engineering disciplines technical programmes. (i.e.) Chemical Engineering, Computer Engineering, Electrical Engineering, Electronics & tele comm. engg, Mechanical Engineering, Marine Engineering, Production Engineering and also about Goods & Services Act in General & Inter Disciplinary area. Architectural Engineering, Aerospace Engineering, Environmental Engineering, Metallurgical & Materials engg & Textile Engineering

I request all the members to attend the forthcoming technical programmes & get benefitted.

We are going to conduct 50th Engineers Day 2017 on 15th September 2017 Evening. The Theme for the year is "Role of Engineers in a Developing India". The venue shall be intimated to you shortly. I request all the members with their families to grace the occasion.

Our Centre has got approval from ELDB & IEI- HQ to conduct 33rd National convention of Electrical Engineers in the emerging topic "Hybrid AC / DC Power System for effective Utilization of Renewable Energy" from 24 to 25 Nov 2017 at NITT in association with BHEL, Tiruchirappalli & National Institute of Technology, Tiruchirappalli. I request all the interested members to participate & disseminate the same to all the relevant industries & get benefitted. The relevant Brochure is also attached with our E News Letter.

32nd INDIAN ENGINEERING CONGRESS is going to be conducted in DECEMBER. 2017 by our Tamilnadu State Centre. We have to extend all our support for the same.

I request all our members to motivate new members to join our IEI to increase our strength.

We are requesting, Expediting & trying to motivate all the engineering colleges and polytechnics in our zone to establish student chapters.

We solicit your support to make our local centre to be the best to disseminate the Engineering knowledge to this part of our country.

With Best Wishes.

(R. SELVARAJ)

SECRETARY DESK.....



1.எண்ணப் ஏனை எழுத்துஎன்ப இவ்விரண்டும் கண்ணப் வாழும் உயிர்க்கு - திருக்குறள்

2.எண்ணும் எழுத்தும் கண்ணத் தரும். - கொன்றை வேந்தன்

3.எண் எழுத்து இகழேல் - ஓளவையார் ஆத்திச்சூடி

எண்: எண்ணுதல்,. சிந்தித்தல் - இலக்கணம் - அறிவியல் - thinking - science, rules, engineering - reasoning - logical - bound to - left brain activity.

எழுத்து கற்பனை - இலக்கியம் - கலை - dreaming - art, beauty, music, song - story - illogical - imagination - free flow - right brain activity.

These two activities are like two eyes for human. These two activities are to be balanced, then only we can get balanced mind.

People who are learning and practicing engineering have to read story books or hear music or draw arts regularly to have balanced mind and to avoid getting bored.

Giving imagination to projects for making them beautiful is a balanced activity that makes both the right and left brains to work together. This will give fulfillment for the project engineer.

Those who are doing research should have custom of imagination about the research. Without imagination people will often get bored while doing research activities. But doing research with imagination, things will go hand in hand and people will not get bored but be enthusiastic.

Bending the sky as bow and twisting sand as rope are illogical imaginations came true. Scientist Albert Einstein discovered that space around large planets are bend (sky is like bow). Fiber optic cable is made of silicon dioxide (sand).

"The True Sign of Intelligence is not Knowledge but Imagination" - Albert Einstein

With Warm Regards,

(S. Lakshmanan)



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"To be a good professional engineer,
always start to study late for exams
because it teaches you how to
manage time and tackle
emergencies."

-Bill Gates





50TH ENGINEERS' DAY 2017

Theme: "Role of Engineers in a Developing India"

September 15 is celebrated every year in the country since 1967 as "Engineers' Day" to commemorate the birthday of the legendary engineer Sir Mokshagundam Visvesvaraya. Sir Visvesvaraya, an eminent Indian engineer and statesman was born in a remote village of Karnataka, the State that is incidentally now the Hi-tech State of the country. Due to his outstanding contribution to the society, Government of India conferred "Bharat Ratna" on this legend in the year 1955. He was also called the precursor of economic planning in India. His learned discourse on economic planning in India, Planned Economy for India and Reconstructing India, was the first available document on the planning effort of the country and it is still held as the parent source matter for economic planners. A theme of national importance is chosen every year by the National Council of the Institution and deliberated at its various State/Local Centres to educate the engineering fraternity in general and the society in particular. This year the 50th Engineers' Day will be celebrated all over the country and the National Council of the Institution has selected the theme as "Role of Engineers in a Developing India" to mark the occasion.

India is still a developing country and its development largely depends upon the robust industrial infrastructure. In the Indian industry scenario, Engineering is by far the largest segment. The nature of engineering industries in India is grossly diversified starting of heavy engineering, light and medium engineering and rural or cottage engineering. India's engineering industry accounts for 27% of the total factories in the industrial sector and represents 63% of the overall foreign collaborations. It has emerged as the largest contributor to the country's total merchandise exports. Indian manufacturing/engineering industry employs over 4 million skilled and semi-skilled workers (direct and indirect). The Indian engineering industry has emerged as a dynamic sector in the country's industrial economy and has made the country self reliant in key areas.

Being the largest foreign exchange earner in the country, the engineering sector gets around 63% of share through foreign collaborations. According to data from the Engineering Export Promotion Council of India, engineering exports from India grew 11.33% year-on-year to reach USD 65.23 billion in FY 2016-17. The Engineering Services market has witnessed substantial growth in recent decades, and has evolved to encompass a broad range of new product development, value-engineering and engineering consulting functions. The Engineering Process Outsourcing (EPO) market is likely to grow by USD 40 billion within 2020. The total offshore engineering spend is likely to grow to USD 125-150 billion by 2020 and India, with its talent pool and experience in engineering services, is well suited to realize 25% of this opportunity.



India has a well-developed and diversified industrial machinery/capital base capable of manufacturing the entire range of industrial machinery. The industry has also managed to successfully develop advanced manufacturing technology over the years. Among the developing countries, India is a major exporter of heavy and light engineering goods, producing a wide range of items. The bulk of capital goods required for power projects, fertilizer, cement, steel and petrochemical plants and mining equipment are made in India. The country also makes construction machinery, equipment for irrigation projects, diesel engines, tractors, transport vehicles, cotton textile and sugar mill machinery.

The nature of Indian engineering exports is also changing with time. India is fast moving from exporting low-value goods to developing countries to exporting high-value goods to developed countries. With development in associated sectors such as automotive, industrial goods and infrastructure, coupled with a well-developed technical human resources pool, engineering exports are expected to grow high and high. Capital goods now account for 26% of total engineering exports. A key driver for increased engineering exports is the trend towards shifting of global manufacturing bases to low cost countries like India. This trend is expected to boost exports of engineering goods from India over the coming years. Among developing countries, India offers the best combination of low costs, availability and skills and capabilities of manpower for the engineering sector.

In terms of availability and skills, India produces over 500 PhDs, 200,000 engineers, 300,000 non-engineering postgraduates and 2,100,000 other graduates each year, thereby ensuring a steady supply of qualified technical manpower for the sector. These huge numbers of qualified engineers are the key factor in developing the country and The Institution of Engineers (India) feels proud to be the largest body of engineers in the country with a dedicated service for the development of the nation since 1920.

TIRUCHIRAPPALLI LOCAL CENTRE

CELEBRATES

50TH ENGINEERS DAY

ON

15TH SEPTEMBER 2017

MORE DETAILS FOLLOWS



TIRUCHIRAPPALLI LOCAL CENTRE CELEBRATED



The Tiruchirappalli Local Centre celebrated the World Telecommunication & Information Society Day 2017 at the premises of IEI, TLC on 16th May 2017. Dr. M A Maluk Mohamed, Director & Correspondent of MASTeR Group of Institutions - M.A.M. College of Engg. & Tech., M.A.M. School of Architecture & M.A.M. BSchool delivered the keynote address on the theme "Big Data for Big Impact".

In his lecture Dr. Maluk said, "The theme, "Big Data for Big Impact," focuses on the power of Big Data for development and aims to explore how to turn unstructured data into actionable information in a development context. The insight brought on by advanced analysis can strongly complement the evidence nature of decision-making that can be leveraged at national, regional and international levels to drive success towards attaining all 17 of the United Nations' Sustainable Development Goals (SDGs) for 2030".

The speaker also informed to the audience that the data collected from various social media networks such as Facebook, whatsapp, twitter, etc. and applications such as Google maps, climate monitoring system are enormous and that cannot be handled by software which were designed for small data and hence these data are to be handled and processed by specialized software which are capable of handling big data. There was lot of interactions from among the participants with the speaker of the programme.

Earlier, the write-up on World Telecommunication and Information Society day 2017 is read by Er N Chockalingam, retired Chief Engineer, TNEB. Er R Selvaraj, Chairman, introduced the speaker and presented a memento to the speaker. Dr E Kirubakaran, AGM, BHEL and Former Chairman, Computer Society of India, Tiruchirappalli Chapter proposed the vote of thanks. Er S Lakshmanan, Honorary Secretary conducted the proceedings.





@ TIRUCHIRAPPALLI LOCAL CENTRE



The World Environment Day was celebrated by the centre in a grand manner on 06th June 2017 at the premises of the centre. Prof. Dr. G Swaminathan, Dept. of Civil Engg., NIT, Tiruchy delivered the talk on the theme of the year “CONNECT WITH NATURE”. Following are the excerpts of the talk delivered by Dr. G Swaminathan.

“The word nature refers to the general realm of living flora, fauna and in some cases physical and material processes associated with the inanimate objects – weather and geology of Earth. Natura, the Latin word for Nature clearly relates to the intrinsic characteristics of plants, animals and other features that is a part of the earth or in this case, the universe. According to Webster dictionary nature is a creative and controlling force in the universe. The physical force regarded as causing and regulating the phenomena of the world is as stated by Oxford Dictionary. We humans are a small but a pivotal part of the nature that is often interpreted as a separate phenomenon created by nature.



On looking further deep, we can notice that out of all the biotic components present in the nature, only humans possess the concept of freewill. This means that even though the humans are a small part of the mighty nature, they have the power to either nurture it or destroy it. So, the concept of humans connecting with nature is not a farfetched or a botched idea, but it rather is a tricky double edged sword. Off late since the past two centuries, there has been a considerable urbanization and industrialization growth which seemingly destructs the ecosystem at the alarming rate. The rules and legislations have been implemented to curb the illegal or improper mechanisms adopted in the industries. That is in other words, we have tried to main stream the destruction of nature. But, when the nature shows its fury, everything comes to the ground state. Mythological explanations are there and very few scientific explanations or proofs exist.



What human race need to understand and realize is that Homo sapiens are not and cannot be an all-powerful entity but a crucial biotic component. Nature as such if we analyze, the three important components are air, water, soil. Combinations of these components create beautiful and other-worldly natural phenomena like snow, rain, fire, mountains, volcanoes etc. Man has undoubtedly utilized these phenomena for his betterment and upbringing in life. In result, he has been involved in creating different kinds of pollution like – Air pollution, Water pollution, soil pollution, Thermal pollution, Noise



pollution and Light Pollution. If we look in man's perspective, of course these pollutions are a necessary evil. But when we look from the outside, they are much bigger than the human and his choice of life. Even when we study about these pollutions, we study on how it affects the air the humans breathe, how it affects the water that we, the humans drink. The perspective has been from the human's point of view. The dinosaurs may have thought of the same thing. But nature extinguished their entire species because it threatened the nature's very own sustenance. Similarly humans must always think and act as to how their actions threaten the nature's law and well-being and hence try to modify so that humans can exist in the nature's good will and live in harmony with all other biotic and abiotic components of the ecological niche.



UNEP initiative in protecting the nature is noteworthy and this year slogan for observing the World Environment Day is, **Connect With Nature.**

We inherit this planet from our children. Let us all work with a focus to protect the Planet in today's state and hand over to the next generation, without much deterioration".


Earlier, Er. S Lakshmanan welcomed the gathering. Er S Mahadevan, Consultant, PCRI, Chennai read out the Environment Anthem (published under the technical pages). Er S Samidas, past Chairman, IEI TLC. Read out the write up on World Environment Day and Er D Harsha, past Chairman, IEI TLC read the write up on WED 2017. Our senior member, Er S Ramadas, Former GM, BHEL introduced the speaker. Er N Chockalingam, retired Chief Engineer, TNEB proposed the vote of thanks and Chairman Er. R Selvaraj presented the memento to the speaker.



First Information Brochure
The Institution of Engineers (India)
 97 years of Relentless Journey towards
 Engineering Advancement for Nation Building

Thirty-third National Convention of Electrical Engineers 2017
 (NCEE 2017)
 and National Seminar on
 'Hybrid AC/DC Power Systems for Effective Utilization of Renewable Energy'


November 24-25, 2017
 Organised by




The Institution of Engineers (India)
 Tiruchirappalli Local Centre

Under the Aegis of
 Electrical Engineering Division, IEI

In association with



Bharat Heavy Electricals Limited, Tiruchirappalli



National Institute of Technology, Tiruchirappalli

VENUE
National Institute of Technology, Tiruchirappalli
 TamilNadu, India
 www.nitt.edu

Travel & Accommodation

The delegates will have to make their own arrangement for travel, boarding & lodging. The list of nearby hotels is available on the website. The Centre will assist in booking the accommodation on advance payment. For details visit website www.iettruchi.org

Sponsorship

Institutional sponsors are invited to support NCEE 2017. The organizers request the kind patronage from the various Governmental Organizations, Industries, Private Sector Companies, Education and R&D Institutions, Consultants, Trading houses – both under private and public sectors for the successful conduct of the event. The names of the sponsoring and cosponsoring organizations will be displayed prominently at the Seminar Venue.

Sponsorship	Amt in Rs.	Privileges
Gold Sponsor	1,00,000/-	05 Free Delegates, Banner in the Seminar Hall, Full Page Color Advertisement in Souvenir, Stall in Exhibition, if held
Silver Sponsor	75,000/-	02 Free Delegates, Banner in the Seminar Hall, Full Page Color Advertisement in Souvenir, Stall in Exhibition, if held
Sponsor	50,000/-	02 Free Delegates, Banner in the Seminar Hall, Full Page Black-White Advertisement in Souvenir, Stall in Exhibition, if held
Co-sponsor	25,000/-	01 Free Delegate, Banner in the Seminar Hall, Full Page Black-White Advertisement in Souvenir
Lunch / Dinner Sponsor	50,000/-	02 Free Delegates, Banner in the Seminar Hall, Full Page Black-White Advertisement in Souvenir

Lunch Sponsor on 24th / 25th Nov. 2017 and Dinner Sponsor on 24th Nov. 2017

Advertisement

A Souvenir will be published during the Convention. It will consist of information on seminar, programme schedule, abstracts of papers and advertisements. It will be distributed to delegates and all those associated with the seminar.

Advertisement	Charges in Rs.
Cover Page Back (4) Colour	30,000
Inside Cover Page Front (2) Colour	20,000
Inside Cover Page Back (3) Colour	15,000
Full Page Color	10,000
Full Page Black & White	6,000

Note : One Free Registration will be provided for every Advertiser

Exhibition Stalls :

10 ft. x 10 ft. : Rs. 15,000/-
 An exhibition is planned to be arranged as part of this seminar for the two days. Stalls of size 10 ft. x 10 ft. will be provided for display of various products related to the theme of the seminar. One free registration will be provided for the sponsors of each exhibition stall. Additional details will be provided later.



RECENT

Lectures



OPTIMISATION OF DRILLING PARAMETERS USING PARTICLE SWARM OPTIMISATION TECHNIQUE

Division: Mechanical Engineering

On 2nd May 2017, Dr. N. Baskar, Professor, Mechanical Engineering, Saranathan College of Engineering, Tiruchirappalli delivered a lecture on “**Optimisation of Drilling Parameters Using Particle Swarm Optimisation technique**” at the institution premises. Er. S Madhavan, former committee member welcomed the gathering and introduced the speaker. Er. S. Samidas, past chairman presented a memento the speaker and Er. S. Lakshmanan proposed the vote of thanks. Er. S R Kannan, Sr. member of the institute offer his felicitations.

In his lecture Dr. Baskar briefed about the experimental work carried out for proper selection of drilling parameters by using the L27 orthogonal array. He also said, “The input process parameters such as spindle speed, feed rate & drill size were selected and examined at three levels, to study the effect of drilling parameters on material removal rate and surface roughness. The results of this experimental investigation are analyzed by using the Minitab software. Based on the experimental results, the regression equations are formulated by using mini tab software. The equations are solved by using the Particle Swarm Optimization (PSO) technique. The optimized parameters are to be recommended to drilling operation.”

ROBOTICS & INDUSTRY

Division: Electronics & Communication Engineering

Computer Society of India, Tiruchirappalli chapter joined hands with the local centre in organising the lecture programme on “**Robotics – Future World**”. E. Joshua Arul Kumar, Associate. Professor, MAM College of Engineering, Tiruchirappalli delivered the lecture on the theme on 9th May 2017 at the institute premises.



In his lecture he said, “This is a surging market: There will be a \$1.5 billion market for consumer and business robots by 2019. The consumer-robot market is the fastest growing. The market for consumer and office robots will grow at a CAGR of 17% between 2014 and 2019, seven times faster than the market for manufacturing robots. There are three dominant categories on the consumer / office side: The consumer / office robot market is currently led by three distinct categories: home cleaning and maintenance, “telepresence” (i.e., telecommuting to events or remote offices), and advanced robots for home entertainment. The rise of





mobile has fueled the push into robotics: The ubiquity of smartphones and tablets has made it easier to develop robots for consumer and office applications. Would-be robot vendors still face some major obstacles: one is the well-studied revulsion that most people feel toward robots that are too humanoid in appearance, and another is the high price demanded for key technologies. Robotics usage in consumer and industry sector has impacted the way the industry functions and has taken them to a newer dimension of safe and intelligent driven work environment.”



Earlier, Er. D. Senthilkumar, Hon. Treasurer of CSI, Tiruchy chapter welcomed the gathering. Er. R Selvaraj, chairman of the centre presented a memento the speaker. Er. S Samidas, past chairman of the centre offered his felicitation. Er. N Rajasekaran, Hon. Secretary, CSI, Tiruchy proposed the vote of thanks. Er. S Lakshmanan conducted the proceedings.

ENERGY CONSERVATION OPPORTUNITIES IN INDUSTRIES & HOUSEHOLDS

Division:Chemical Engineering

On 23rd May 2017, Dr. N Stalin, Asst. Professor, Dept. Of petrochemical technology of Anna University delivered a lecture on Energy Conservation Opportunities in Industries & Households at the institution premises. In his lecture he said, “The industrial sector alone accounts for about 50% of the commercial energy. It uses both, the thermal and electrical energy in various equipments like boilers, compressors, furnaces, diesel generating engines, motors, pumps, refrigeration, etc. By optimising the utilization factor of the above components will lead to energy savings. Lighting is also a factor where lots of energy could be saved”.

Earlier Er S Mahadevan, Consultant, PCRI, Chennai welcomed the gathering and introduced the speaker. Er P Kothandaraman, Consultant, PCRI, Chennai presented a memento to the speaker. Er S Ramadas, Former GM, BHEL offered his felicitations. Er. G Arumugam proposed the vote of thanks. Er. S Lakshmanan conducted the proceedings.

FABRICATION PRACTICES AND INTEGRITY EVALUATION OF LARGE WELDED SHIP STRUCTURES

Division:Marine Engineering



The institute conducted a lecture programme on “FABRICATION PRACTICES AND INTEGRITY EVALUATION OF LARGE WELDED SHIP STRUCTURES” on 0th May 2017 in association with IIW, ISNT and IIIE. Dr. G Ravichandran, former General Manager of WRI & Labs of BHEL, Tiruchy delivered the lecture at the institute premises. In his lecture he covered the fabrication aspects and methods to control distortion in ship building.

In his lecture Dr Ravichandran said, “The fabrication of a ship structure involves fabrication of various subassemblies which must be finally assembled in the dockyard. A typical 60000 DWT bulk carrier has a total weld length of 255 km. Nearly 95% of the welds are of fillet welds joining various stiffeners to



the plate. The stiffeners run both in the longitudinal and transverse directions and since the overall length is high, the distortion is a major issue to be tackled in a shipyard. The distortion is of two types viz. bending and angular distortion. The bending distortion can be effectively tackled by the use of pre bending, back to back welding, back to back welding with pre bending, use of stiffeners etc. The angular distortion can be effectively minimized by the adoption of suitable welding sequence. To predict the distortion due to welding, special software such as SYSWELD can be employed.



Some of the other procedures for minimizing distortion include minimizing root gaps, minimizing misalignment, use of stiffeners, proper tack welding, minimizing heat input, using processes such as heat sink welding etc. The proper employment of the welding procedure can result in the fabrication of a structure with controlled distortion levels. The selection of welding consumable may have to be done so that the consumable passes the requirement of a corrosion fatigue. Since the ship structure is subjected to corrosion fatigue, the selection of welding consumable is done using a special test involving corrosion fatigue.”



Earlier Er. R. Selvaraj, Chairman welcomed the gathering and presented a memento to the speaker. Er. S Ramadas, former GM, BHEL offered his felicitations. Er. A. Santhakumari, SDGM (WRI) & EC member (IIW), proposed the vote of thanks. Er. S Lakshmanan, Hon. Secretary conducted the proceedings.

WELDING AUTOMATION – TECHNOLOGY & APPLICATIONS

Division: Mechanical Engineering



Mr. Amlan Saha, Automation PW of Fronius India Pvt. Ltd., Pune delivered a lecture on “Welding Automation - Technology and Applications” in the special programme organised by the centre in association with IIM and IWS. In the well-attended lecture programme conducted on 1st June 2017 at SK Mazumder hall, institutions building, BHEL Township, Mr. Saha explained about low cost automation in fabrication industries. He explained the applications of automation with case studies. He also said that by incorporating automation a company can reap the benefits of enhanced quality and productivity.



Earlier Er. R Selvaraj, Chairman of IEI, TLC welcomed the gathering. Er. S Singaravelu, Hon. Secretary, IWS SZ introduced the speaker. Er. L D Prabhu, EC member of IWS, SZ presented a memento to the speaker. Er. A. Santhakumari, NGC Member of IWS, proposed the vote of thanks. Er. N Rajasekaran, Vice chairman, of IIM

Tiruchy chapter conducted the proceedings.



AUTOMATED LEARNING & INTELLIGENCE

Division: Computer Engineering



A lecture on “Automated Learning & Intelligence” was conducted by the institute on 13th June 2017 at the premises of the institution. Dr. A. Raghunathan, Addl. GM (HRDC), BHEL, Tiruchy delivered the lecture in the programme organised in association with CSI, Tiruchy chapter.

In his lecture, he described how machines are increasingly being trained to learn to think and act intelligently like humans and how they are proving useful to us in various walks of life. He briefly traced the history and evolution of Artificial Intelligence and described the tremendous growth of machine intelligence and learning over the last decade. He discussed the various components of intelligence and discussed the influence of several fields on the growth and



application of machine intelligence and learning. He pointed out how the recent growth in related areas like Big Data, IoT, digitalization, etc. is also spurring the development of algorithms for machine intelligence and machine learning. He then explained the machine training and learning process and creating a model which can be used for prediction.



He also briefly discussed the advanced current trends on deep learning and cognitive computing and concluded his lecture by citing current research work in the area of machine learning and automated intelligence including a few under his own guidance.



Earlier Er. D. Senthil Kumar, Hon. Treasurer of CSI, welcomed the gathering and introduced the speaker. Er. R Selvaraj, Chairman presented a memento to the speaker. Earlier Er. N. Rajasekaran, Hon. Secretary of CSI, Tiruchy chapter offered his felicitations. Er. S. Rajagopal proposed the

vote of thanks. Er. S Lakshmanan, Hon. Secretary conducted the proceedings.

MODERN AERODYNAMIC TECHNOLOGIES TO IMPROVE AIRCRAFT PERFORMANCES

Division: Aerospace Engineering

Modern aerodynamic technologies to improve aircraft performances is the theme of the talk delivered by Dr. Nadaraja Pillai, Associate Professor, School of Mechanical Engineering, SASTRA University at the institution premises of 20th June 2017. In his lecture Dr. Pillai said, “Aerodynamic characteristics along with improvement in aerodynamic efficiency of the aircraft are to be considered to reduce the airline fuel



consumption and to afford economic flight to the users. There are three major causes which could possibly degrade the aerodynamic characteristics viz. Drag, Stall and three dimensional span wise flow. Studies claim that controlling and managing flow separation increases the performances. Flow control is focused on the mitigation of flow separation by using different strategies like active, passive and hybrid techniques”. Detailed write up by Mr. Pillai is published under technical pages.



Earlier Er. S. Ramadas, our senior member welcomed the gathering and introduced the speaker. Er. N. Rajasekaran, Committee member of the centre, offered his felicitations. Er. R Selvaraj, Chairman presented a memento to the speaker. Er. S. Rajagopal proposed the vote of thanks. Er. S Lakshmanan, Hon. Secretary conducted the proceedings.



COMFORT PROPERTIES OF TEXTILE MATERIALS

Division: Textile Engineering



The lecture held on 27th June 2017 by Er. G Suganth, Head of the Department, Department of Textile Technology, Pavendar Bhrathidasan College of Engineering and Technology, Tiruchirappalli enlightened the audience on the Comfort Properties of Textile Materials.



Earlier Er. S. Ramadas, welcomed the gathering and introduced the speaker. Er. S. Dharmalingam, past chairman presented a memento to the speaker. Er. N. Rajasekaran, Committee member of the centre, proposed the vote of thanks. Er. S Lakshmanan, Hon. Secretary conducted



the proceedings.

Visit our Website

<http://ieitiruchi.org/>

and send your feedback to

ieitlc1973@gmail.com



AUGUST 2017			
Date	Division	Topic	Speaker
01-08-2017	Electrical Engineering	Power Generation from Non-Edible Seed Cakes	Er M. Vivek Research Scholar Periyar Maniyammai University Vallam, Thanjavur
08-08-2017	Computer Engineering	Digitalization	Er R. Rohith Senior Manager (P & D) BHEL, Tiruchy
16-08-2017	Architectural Engineering	Introduction to Architectural Engineering	Ar Rajaa. G Principal Architect Signature Designs, Tiruchy
22-08-2017	Metallurgical Engineering	Composite Materials & its Application in Wind Turbine Generators	Er Mohana Krishna Dhamodharan Project Lead & Wind Energy Tech Mahindra
29-08-2017	General & Inter Disciplinary	IMS 5 -Integrated Management System	Er M. Pavithra Manager Industrial Acoustics, Tiruchy
SEPTEMBER 2017			
05-09-2017	Civil Engineering	Natural & Anthropogenic Disasters	Dr. R. Manjula Assistant Professor Dept. of Civil Engg. NIT, Tiruchy
12-09-2017	Computer Science	Digital Signature	Er D. Senthil Kumar Sr. Manager (ITS & S) BHEL, Tiruchy
19-09-2017	Agricultural Engineering	Conversion of Agricultural Waste into Useful Products	Er Hemath Mohit CS Research Scholar Dept. of Civil Engg NIT, Tiruchy
26-09-2017	Architectural Engineering	Emerging Trends in Architectural Engineering	Er Senthil Kumar Professor Dept. of Architecture CARE College, Tiruchirappalli

For Details Please see Engagement Column of Leading Newspapers of Tiruchirappalli



32nd INDIAN ENGINEERING CONGRESS

Chennai, December 21-23, 2017

Theme:

Innovation in Engineering : Competitive Strategy Perspective

Organized by: **The Institution of Engineers (India)**

Hosted by: **Tamilnadu State Centre**

Contact : Organising Secretary, 32nd Indian Engineering Congress, The Institution of Engineers (India), Tamilnadu State Centre, 19 Swarni Sivaranda Salai, Chepauk, Chennai 600005, Tel: (044) 25360614, 64998729, Fax: (044) 25369433
Email: tnsoc@ieindia.org



**TECHNICAL
PAGES**

World Environment Day Anthem

An Earth Anthem penned by poet Abhay K is sung to celebrate World Environment Day

**Our cosmic oasis, cosmic blue pearl
the most beautiful planet in the universe
all the continents and the oceans of the world
united we stand as flora and fauna
united we stand as species of one earth
black, brown, white, different colours
we are humans, the earth is our home.**



**Our cosmic oasis, cosmic blue pearl
the most beautiful planet in the universe
all the people and the nations of the world
all for one and one for all
united we unfurl the blue marble flag
black, brown, white, different colours
we are humans, the earth is our home.**

It was launched in June 2013 on the occasion of the World Environment Day by Mr. Kapil Sibal and Mr. Shashi Tharoor, then Union Ministers of India, at a function organized by the Indian Council of Cultural Relations in New Delhi. It is supported by the global organization Habitat for Humanity.



Modern Aerodynamic Technologies to improve Aircraft Performances

Dr. S. Nadaraja Pillai

Associate Professor in Aerospace Engineering, School of Mechanical Engineering,

SASTRA University, Thanjavur – 613401, INDIA

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Introduction

Recent developments in global economic developments boosted the growth in passenger and air cargo and its profitability in air transport industry. IATA's 20-year forecast states that air passenger numbers will double to seven billion annually by 2034. Among the world's top ten global air passenger market, India has been ranked as 8th fastest growing country with a CAGR (Compound Annual Growth Rate) of 3.4 %. Despite this phenomenal growth, passengers are demanding more economic flight options that take advantage of the latest technology. For a typical long range aircraft, 1% of drag reduction leads to the decrease of about 0.2% of the direct operating cost (DOC). Fuel continues to be the largest number in the airline debit column, accounting for 27% of an airline's costs in 2015. Thus, it is mandatory to consider the aerodynamic characteristics along with improvement in aerodynamic efficiency of the aircraft to reduce the airline fuel consumption and to afford economic flight. There are three major causes which could possibly degrade the aerodynamic characteristics, 1) Drag 2) Stall 3) three dimensional span wise flow. Studies claim that controlling and managing flow separation increases the performances. Flow control is focused on the mitigation of flow separation by using different strategies like active, passive and hybrid techniques.

Drag Characteristics

The main sources of drag is basically skin friction and pressure drag. Such drag force resists the airplane to move forward or in other words, it consume more fuel to take the aircraft forward. It means that the amount of thrust need to be produced is larger if there is larger drag. Hence the consumption of fuel in turn increases if the drag produced is large which account directly to the airline cost.

Flow Separation

In recent years, there has been increased interest in the field of flow separation and its untoward effects on aerodynamic bodies. Among them the aircraft wings, wind turbine blades and propeller are few on which flow separation has severe effect as it leads to various flow complexities and in turn reduces the aerodynamic efficiency. Researchers started adopting several new technologies to control and manage the flow separation and its effects. The flow on aerodynamic surfaces should remain attached even at greater angles of attack to provide enhanced operational capability, efficiency, range and endurance. Potentially, the largest drag component pressure or form drag becomes troublesome, particularly, when the flow separation occurs.

Three dimensional span wise flow

Since there is a pressure difference between lower and the upper surface of the wing, at all the locations where this pressure differences converts into the forces. At the end of the wing or at the wing tip, the high pressure region air try to come to the low pressure region air and hence forms a vortex. The vortex strength is more enough to contribute to create more drag on the airplane. This drag is called induced drag. Induced drag can be reduced by installing the winglets, which is a small projection on the wing tip, which necessarily resists the flow from high pressure region to the low pressure region. This leads to the formation of decrease in vortex strength and thus reduces the induced drag. The winglets are of various kinds and angles that depend on the design of the aircrafts.



Humpback Whale and Aerodynamics

Humpback whales are distinct among the large-size whales to take sharp manoeuvres to catch their prey using sinusoidal wavy flippers. Every flipper has large round shapes along its leading-edge called tubercles which act as flow-control devices to improve their performance and manoeuvrability of the whales. Various researchers confirmed that these tubercles modifies boundary layers by forming vortices, this causes enhancement of lift without adding drag. The vortices generated due to the variation of the chord and thickness along the tubercles is expected to delay the onset of the stall by energizing the boundary layer for greater attachment. Designing an aircraft wing by implementing tubercles has been beneficial in improving the aerodynamic characteristics. However, the successful integration of tubercles from humpback whales into aircraft wing is challenged by its geometrical topology. Basically the following parameters can segregate the design with various cases. They are amplitude, Inter tubercle spacing (Wavelength), Radius of curvature, Chord and span length of the wing.

The present Study concerns the effects of passive (tubercles), active (blowing) flow control combinations and blowing position on the surface of leading edge serrated wing along span-wise at various angles of attack. It's expected that blowing enhances lift and efficiency when blow near the leading edge with tubercles.

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