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THE SOUTHERN INDIA Engineering Manufacturers' Association

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SIEMA had arranged for a Seminar on Draft Master Plan for Coimbatore. Vice President Sri. Mithun Ramdas gave the welcome address. Sri. P. Kathiravan, Dean Faculty of Architecture, Design & Planning from Karpagam Academy gave his presentation.

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Dear SIEMA Members,

s we step into April, I extend my warmest wishes for a successful financial year ahead to all our valued members.

Last month, our Technical Committee Chairman Dr. C. Murugesan, MC Member Sri. Dileep, TC Member Sri. Prasad, and I, along with a few of our members, visited the MCE Mostra Exhibition in Milan, Italy; the World Magnetic Conference and Coiltech Exhibition in Augsburg, Germany; and a couple of European Pump manufacturers. These visits provided valuable insights into the export potential for pumps. We are excited about the opportunities that lie ahead for our manufacturing members in the global market.

It is at this opportune time that SIEMA is in the process of forming a Special Purpose Vehicle (SPV) dedicated to promoting pump exports for our member industries. Named 'SIEMA EXIM' this initiative represents a significant step forward in our efforts to facilitate and streamline export activities, particularly in key markets such as the United States and Europe. I urge all members to participate in this endeavour.

Last month, SIEMA organized two informative seminars that garnered active participation from our members and sister associations. The seminar on Sec43B(h) of Income Tax on MSME Transactions shed light on crucial tax implications. The session on the 'Draft Master Plan for Coimbatore' raised awareness and provided solutions for some of our members facing issues.

I would like to draw your attention to a new regulation regarding the audit trail requirement set forth by the Ministry of Corporate Affairs. Every company covered under the Companies Act, using accounting software, must ensure that it has the capability to record audit trails of all transactions. This feature is essential for ensuring compliance with statutory requirements. Please ensure compliance with this regulation.

Thank you for your continued support and participation in SIEMA's initiatives.

Warm Regards,

D. Vignesh

SIEMA Magazine

OFFICE BEARERS

President Sri D. Vignesh

Vice-Presidents Sri Mithun Ramdas Sri Ma. Sendilkumar Sri Arun Ranganathan

Editor Sri D. Vignesh

The opinions and views expressed in this magazine are those of the respective authors.

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April 2024



- To extend support to our member industries to prosper
- To offer up-to-date technical support to members
- To train and enable members to meet the global challenges in technology and competitiveness
- To develop techno-commercial cooperation with international enterprises
- To promote programmes for enhancing the quality of life of all stake-holders
- To represent members on common issues with the policy makers.

TECHNICAL CALENDAR OF EVENTS (BIS/BEE)

- IPMA president Sri. K.V. Karthik, TC Members, Dr. Subramanian, Arun, Krishnamoorthy, P.Ramesh and G.Prasasth attended ETD 15 Rotating Machinery TC Meeting on 22-3-2024 at 14:30 online.
- Our President Sri. D. Vignesh, TC Chairman Dr. C. Murugesan and MC Member Sri. Dileep visited MCE Exhibition on 12th to 15th March 2024 at Milan.
- Our President Sri. D. Vignesh and TC Chairman Dr. C. Murugesan visited Ebara Italy, Project Automation, Italy, Speroni, Italy.
- Also they attended World Magnetic Conference at CoilTech Augsburg, Germany and visited CoilTech Exhibitionon 20th and 21st March 2024.
- *PPT on the Expo, & a video of Ebara was screened.*

SUBJECT RELATING TO CENTRAL & STATE GOVERNMENT

Naan mudhalvan: On 22nd February, 2024

The statewide Placement drive was organised by the state government, an opportunity that helps both the organization and the state's youth to gain employment.

Representation was submitted to Smt. Archana Patnaik: On 4th March, 2024

On behalf of SIEMA a Representation was submitted to Smt. Archana Patnaik, Secretary, Ministry of Industries, Government of Tamilnadu, regarding "Our request to Promote Pump Manufacturing as a Priority Sector and other initiatives."

NABL Awareness Program for Coimbatore MSME's was conducted on 15th March 2024

A Program was held at SITRA, Coimbatore. The program was organized by SIEMA, COINDIA & SITRA. Immediate Past President Sri. K.V. Karthik rendered his presentation at the event.



BJP had arranged for an Interactive Meeting with Thiru. Karvendan Ex M.P, and Thiru. Ramesh Kumar, CBE District President. On 19th March, 2024

Representation on Election Manifesto was handed over to both Thiru Karvendan Ex MP & Thiru. Ramesh Kumar CBE District President, BJP. Sri. K.V. Karthik, Immediate Past President, attended the meeting and submitted the Representations.

Draft Master Plan Meeting of Stakeholders: on 8th March 2024

Vice President Sri. Mithun Ramdas attended the Stakeholders meeting called by the LPA at the Collectorate on 8th March 2024.

REPRESENTATION TO VARIOUS BODIES

PLACEMENT CAMP - ONLINE MEETING on 22nd February, 2024

They had arranged for placement camp to be held on 24th with all Arts and Science College and on 26th for all Engineering Colleges. They had arranged for a Google meet to discuss on this. President Sri. D. Vignesh attended the Google meet.

Interaction meeting with the Indonesian Consul General, on 5th March, 2024

President Sri. D. Vignesh attended the meeting. He met and discussed with Mr. EddyWardoyo -Consul General of The Republic of Indonesia and Mr. Nogroho Priya Pratoma - Director of Indonesia Trade Promotion Centre, Chennai.

Online Meeting with CapGrid: On 15th March 2024

An online meeting was arranged by CapGrid exclusively for SIEMA Members. Few of our members attended the online meeting.

Si'Tarc GC Meeting on 27th February 2024

President Sri. D. Vignesh & Vice President Sri. Mithun Ramdas attended the meeting.

Chamber GC Meeting on 11th March 2024

President Sri. D. Vignesh & Vice President Sri. Mithun Ramdas attended the GC Meeting of Chamber.

Slurry Pump Review meeting

Slurry Pump review meeting was attended by the President Sri. D. Vignesh & Vice President Sri. R. Arun.

OTHER ACTIVITIES OF SIEMA

Special Purpose Vehicle (SPV) for export promotion under the banner of SIEMA

Vice President Arun provided an overview of the objectives of forming the SPV. The Management Committee gave their approval to proceed with the formation of the SPV as a Section 8 company, subject to further exploration of government grants and incentives available for export promotion.

SEMINAR on Sec43B(h) of Income Tax on MSME Transactions on 13th March 2024

SIEMA had arranged for a Seminar on Sec43B(h) of Income Tax on MSME Transactions. Members appreciated the program.

SEMINAR on "Draft Master Plan for Coimbatore" On 22nd March 2024

SIEMA had arranged for a Seminar on Draft Master Plan for Coimbatore. All members were invited. Sri. P. Kathiravan, Dean Faculty of Architecture, Design & Planning from Karpagam Academy gave his presentation. Vice President Sri. Mithun Ramdas on behalf of SIEMA, President KV. Karthik on behalf of COINDIA & Mr. Karthikeyan on behalf of Si'Tarc chaired the meeting. A good number of Members attended the Seminar. Members from other Associations also participated.

Life Membership option for SIEMA members

The Office Bearers initiated the discussion by providing background information on the proposal and highlighting the benefits it would offer to SIEMA members. After thorough deliberation, the Management Committee Members unanimously agreed in principle to include the Life Membership option in the bylaws of SIEMA. It was decided that a formal resolution for this proposal would be put forward in the next MC Meeting for final approval.



குறை சொல்பவர்களுக்கு...

குறை சொல்பவர்களுக்கு நன்றி சொல்லுங்கள். ஏனென்றால் உங்களை நீங்களே செதுக்கி கொள்வதற்கு அவர்கள்தான் உளி கொடுக்கின்றனர்.



12-15 Marzo/March 2024 | Fiera Milano

Last month, President Sri. D. Vignesh, our Technical Committee Chairman Dr. C. Murugesan, MC Member Sri. Dileep, TC Member Sri. Prasad, along with a few of our members, visited the MCE Mostra Exhibition in Milan, Italy; the World Magnetic Conference and Coiltech Exhibition in Augsburg, Germany; and a couple of European Pump manufacturers. These visits provided valuable insights into the export potential for pumps. We are excited about the opportunities that lie ahead for our manufacturing members in the global market.















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The Fundamentals of Mechanical Seals An Introduction to lechanica SAR milleritions and the / \ 7

Alan Evans

echanical seals are precision, dynamic devices that are used to seal process fluids from the environment and have been utilized by pump and other rotating equipment users for approximately 100 years. Today, the same four basic components and fundamental principles apply to all mechanical seals, but this technology has evolved over the past 100 years, so seal users have a variety of choices

to meet their specific technical, commercial and reliability needs.

The purpose of this series is to give users a foundational background in the technology of mechanical seals from which they can start to make informed decisions regarding the different types and configurations available for today's applications. First, however, we need to understand just how a mechanical seal works.

To understand how a mechanical seal works, we need to understand the basic components that make up the anatomy of any mechanical seal. Image 1 shows the cross section of two different types of mechanical seals, which show the same basic four components.

The components of a mechanical seal include the following:

1. Seal Face Pair

The seal face pair creates the primary sealing interface, which provides rotational, dynamic

IMAGE 1: The cross section of two different types of mechanical seals, showing the same basic four components (Images courtesy of A.W. Chesterton Company)

* Alan Evans is the global director of product line management for the A.W. Chesterton Company's mechanical seal business. Evans offers over 40 years of experience working with industrial systems and equipment, including rotating and stationary equipment in a multitude of industries. For the past 30 years, he has been working with pumps and sealing systems with a focus on improving reliability and reducing the total cost of ownership for the plants he has worked with globally. Evans holds a BS in mechanical engineering and an MBA in high technology management. He is also a classically trained reliability engineer. Prior to working with Chesterton, Evans was a maintenance reliability engineer working in the chemical and minerals processing industries. For more, visit chesterton.com.



Sealing Interface



2024

sealing within the mechanical seal. Depending on the seal configuration, there will be either one face pair known as a single seal or two face pairs, which are known as a double seal. Some mechanical seals may have more face pairs, but these seals are custom designed for a specific application. The face pairs are made from a variety of carbon/ graphite materials, as well as hard ceramic materials such as silicon carbide, tungsten carbide or alumina ceramic. Each of these materials offers different operating characteristics and capabilities to the mechanical seal.

2. Secondary Seals

Each mechanical seal will also have a variety of secondary seals, which are used to prevent leakage from various other interfaces within the mechanical seal. Most of these secondary seals are static in nature, but one is dynamic to allow the seal faces to dynamically track each other when the equipment is in operation. If the seal face pair loses dynamic tracking, there will be excessive leakage from the mechanical seal.

Secondary seals come in a variety of different elastomeric materials in various forms, including O-rings, gaskets, wedges, boots or metal/elastomer bellows, as shown in Image 2.

3. Springs & Loading Mechanisms

The third major component of any mechanical seal are the springs or other loading mechanisms used to maintain face contact during static, nonrotational times and dynamic tracking during operation.

These springs and loading mechanisms can take the form of a large diameter single spring, multiple smaller diameter springs, leaf springs, wave springs or a metal or elastomeric bellows. The proper function of these loading mechanisms



IMAGE 2: Mechanical seal showing the various secondary seals, including O-rings and a gasket

is critical to the leakage control of any mechanical seal. Image 4 shows some of the different loading mechanisms that can be used.

4. Structural Components & Hardware

The last major components are the metal parts and hardware. These include the gland, sleeve, lock ring and the various pieces of hardware used in the mechanical seal.

Glands are typically supplied in a stainless alloy, but depending on the application requirements, several other alloys may be used, including alloy 20, duplex or super duplex, titanium, Hastelloy or Inconel. The hardware and fasteners include pins, lugs and screws, which are used to assemble and hold the seals components in place.

5. Setting Clips

The final component is the seal's centering device or setting clips. These devices have two critical functions. First, they aid in the shipping of the mechanical seal to assure there is no



IMAGE 4: Different types of loading mechanisms

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IMAGE 6: Cross section of a typical cartridge seal's structural components and hardware

internal movement that could damage the seal faces or other components. Secondly, and just as importantly, these centering devices set the intended spring compression to assure optimal seal operation and reliability. Image 6 shows the cross section of a typical cartridge seal's structural components and hardware.

The second area that all mechanical seals share are the configurations offered by the various manufacturers. The seal configuration offered is dependent on the requirements of the application. There are both general configurations offered as well as application specific configurations to suit specific industry needs. Most seal manufacturers offer a variety of these configurations.

Component Seals

A component seal is one where the rotary component and stationary component are two separate units that must be assembled during pump assembly. This configuration dates to the first mechanical seals offered to the market. They are simple and low cost, but they typically do not have the same performance capabilities found in other configurations.

Cartridge seals

Cartridge seals are built on the concept that the seal components are assembled into a cartridge unit. This configuration offers greater reliability, as it dramatically simplifies the installation process, as well as reduces the time frame required. Cartridge seals are offered in single, double or tandem configurations to suit the specific application requirements and offer higher operating capabilities. Image 7 shows the various cartridge configurations available.

Split Mechanical Seals

Split mechanical seals have been available off the shelf for the past 40 years. As the name implies, they are fully split, which allows for installation and repair without the need for costly removal of rotating equipment when excessive seal leakage occurs. This technology has seen several evolutions over the past 40 years, which have resulted in improvements in the ease of installation as well as sealability, approaching higher performance cartridge seals. Image 11 shows the typical configuration.

Equipment & Application Specific Designs

Finally, there are many equipment or application specific seal designs that offer an optimized solution for challenging application. For example,







IMAGE 11: Typical configuration of a split mechanical seal

slurry seal technology offers seal faces designed to limit the potential of pulling particulates into the sealing interface and are designed to be more robust than standard seals to handle the motion and shocks many slurry pump applications experience. Image 8 shows a cross section of a slurry seal design.

Gas seal technology is another adaptation for specific applications where an inert gas barrier is

needed due to the application requirements. The seals are based on compressor gas seal technologies but are adapted specifically to pumps. This seal design does not rely on a liquid to provide the seal with its required lubrication and cooling, instead an inert clean/dry barrier gas such as nitrogen is used. One of the seal faces in a gas seal design will have face features that help to separate the faces while in operation, known as hydrodynamic lift. Some designs also include a degree of hydrostatic lift, which means the faces begin to separate before seal rotation starts. Image 9 shows a cross section of a gas seal design specifically for pumps.

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Mixer seals are a special category of equipment/ application specific design that incorporate



IMAGE 8: Cross section of a slurry pump seal design



IMAGE 9: Cross section of a gas seal design for pumps



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Carbon steam joints are available as single-acting and double-acting seals. Carbon graphite can cater to a broad range of applications as seal rings. They can perform under tough conditions and are blister resistant to function in dry environments as well. The high thermal conductivity and low thermal expansion coefficient allow for optimum product precision and high tolerance.

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IMAGE 10: Features used in various mixer seal designs

several different capabilities to meet the needs of the specific mixer/reactor/agitator application. These seals can include:

- extra motion capabilities
- dry running capabilities
- debris wells
- integral bearings for greater stabilization
- hydrostatic lift capabilities for slow shaft speed applications
- design for glass-lined vessels that cannot accept a standard metallic alloy due to the nature of the fluid sealed.

Today, plants have a variety of designs and configurations to choose from. Determining which to use can be difficult at times. This is where a trained sealing device specialist can help in the seal selection process. In next month's edition, we will explore how a mechanical seal "seals" and what features to look for based on the application's specific requirements.



பொறமை அனுபவத்தின் வெளிப்பாடு

தாமஸ் ஆல்வா எடிசன் அவர்கள் வெஸ்டர்ன் யூனியன் நிறுவனத்திற்கு ஒரு இயந்திரம் வடிவு அமைத்துக் கொடுத்தார்.. அதற்கு என்ன விலை நிர்ணயம் செய்யலாம்? என்பது சற்றுக் குழப்பமாக இருந்தது.. எடிச னும்,அவரது மனைவியும் இது பற்றி விவாதித்தார்கள்..எடிசன் மனைவி, இருபதாயிரம் டாலர் கேளுங்கள்' என்றார். எடிசனோ, 'இந்தத் தொகை பெரிய தொகையாக இருந்தால் யாரும் வாங்காமல் போனால் என்ன செய்வது?' என்று சிந்தித்துக் கொண்டு இருந்தார். பணம் தருவதற்காக நிறுவனத்தின் ஒரு மூத்த அதிகாரியை வெஸ்டர்ன் யூனியன் நிறுவனம் அனுப்பி இருந்தது. இயந்திரத்துக்கான விலையை அதிகாரி கேட்டார். எடிசன் சில நிமிடம் மௌனமாக இருந்தார். 'எப்படிக் கேட்பது' என்று யோசித்துக் கொண்டே இருந்தார். பொறுமை இழந்த அந்த நிறுவனத்தின் அதிகாரி, 'எடிசன் சார். இதோ உங்கள் இயந்திரத்திற்க்கான விலை, 'முதல் தவணையாக நூறு ஆயிரம் டாலர்கள்' என்று சொல்லி அதற்கான காசோலையைக் கொடுத்தார். மீதி எவ்வளவு என்று சொல்லி அனுப்புங்கள், காசோலையை அனுப்பி வைக்கின்றோம்' என்று கூறி இயந்திரத்தை எடுத்துச் சென்றார். அவசரப்படாமல், பொறுமை காத்த எடிசனுக்கு நான்கு மடங்கு இலாபம் கிடைத்தது. அவசரப்பட்ட நிறுவனத்தின் அதிகாரியால் நான்கு மடங்கு நட்டம் நிறுவனத்திற்கு ஏற்பட்டது. அவச ரம் நமக்கு சிப்பிகளைத் தரலாம், ஆனால் பொறுமையே முத்துகளைத் தர முடியும். ஒருவனுடைய திறமைகளை வெற்றிகளாக உருமாற்றித் தருவது அவரின் பொறுமையே! பொறுமை அனுபவத்தின் வெளிப்பாடு! அதுவே வாழ்வின் அலைகளை எதிர்கொள்ளும் துடுப்பாய் பயன் தரும்.





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SEMINAR on Sec43B(h) of Income Tax on MSME Transactions on 13th March 2024







SIEMA had arranged for a Seminar on Sec43B(h) of Income Tax on MSME Transactions.

NABL Awareness Program for Coimbatore MSME's was conducted on 15th March 2024





A Program was held at SITRA, Coimbatore. The program was organized by SIEMA, COINDIA & SITRA. Immediate Past President Sri. K.V. Karthik rendered his presentation at the event.



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Water the Elixir of Life

Humankind has always searched in vain for an imaginary elixir oflife, the divine Amrita, a draught of which was thought to confer immortality. But the elixir of life lies near our hands. For it is the commonest of all liquids, plain water! I remember one day standing on the line which separates the Libyan Desert from the Valley of the Nile in Egypt. On one side was visible a sea of billowing sand without a speck of green or a single living thing anywhere visible on it. On

the other side lay one of the greatest, most fertile and densely populated areas to be found anywhere on the earth, teeming with life and vegetation. What made this wonderful difference? Why, it is the water of the river Nile.

This common substance which we take for granted in our everyday life is the most potent and the most wonderful thing on the face of our earth. It has played a very significant role in shaping the course of the earth's history and continues to play the leading role in the drama of life on earth.

Geologists tell us that the entire soil of the Nile valley is the creation of the river itself. Egypt, in fact, was made by its river. Its ancient civilisation was created and is sustained by the life-giving waters of the Nile.

This common substance which we take for granted in our everyday life is the most potent and the most wonderful thing on the face of our earth. It has played a very significant role in shaping the course of the earth's history and continues to play the leading role in the drama of life on earth.

There is nothing which adds so much to the beauty of the countryside as water, be it just a little

stream trickling over the rocks or a little pond by the wayside where the cattle quench their thirst. The rain-fed tanks that are so common in South India are a cheering sight when they are full. They are, of course, shallow, but this is less evident since the water is silt-laden and the bottom does not therefore show up. These tanks play a vital role in South Indian agriculture. In Mysore, for example, much of the rice is grown under them. Some of these tanks are surprisingly large and it is

> a beautiful sight to see the sun rise or set over one of them.

One of the most remarkable facts about water is its power to carry silt in suspension. This is the origin of the characteristic colour of the water in rain-fed

tanks. This colour varies with the nature of the earth in the catchment area and is most vivid immediately after a fresh inflow following rain. Swiftly flowing water can carry fairly large and heavy particles. The finest particles, however, remain floating within the liquid in spite of their greater density and are carried to great distances. When slit-laden water mixes with the salt water of the sea, there is a rapid precipitation of the suspended matter. This can be readily seen when one travels by steamer down a great river to the deep sea. The colour of the water changes successively from the muddy red or brown of silt through varying shades of yellow and green



fmally to the blue of the deep sea. Great tracts of land have been formed by slit thus deposited. Such land, consisting as it does of finely divided matter, is usually very fertile.

The flow of water has undoubtedly played a great part in geological processes. The same agency, however, under appropriate conditions, can also play a destructive part and wash away the soil. The problem of soil erosion is of major significance in various countries and especially in many parts of India. Soil erosion occurs in successive steps, the earliest of which may easily pass unnoticed. In the later stages, the cutting up and washing away of the earth is only too painfully apparent in the formation of deep gullies and ravines which make all agriculture impossible. Sudden bursts of excessively heavy rain resulting in a large run of surplus water are the principal factors in causing soil erosion. The slop of the land, removal of the natural protective coat of vegetation, the existence of ruts along which the water can flow with rapidly gathering momentum, and the absence of any checks of such flow are also causes for soil erosion.

Soil erosion is dangerous to agriculture. The terracing of the land, construction of bunds to check the flow of water, the practice of contour cultivation and the planting of appropriate types of vegetation are the measures that can be used to check soil erosion.

Water is the basis of all life. Every animal and every plant contains a substantial proportion of free or combined water in its body, and no kind of physiological activity is possible without water. Water is, of course, necessary for animal life, while moisture in the soil is equally imperative for the life and growth of plants and trees. The conservation and utilisation of water is thus fundamental for human welfare. Apart from artesian water the ultimate source in all cases is rain or snowfall. Much of Indian agriculture depends on seasonal rainfall. The problems of soil erosion and of inadequate or irregular rainfall are closely connected with each other. It is clear that the adoption of techniques preventing soil erosion would also help to conserve and keep the water where it is wanted.

Collection and utilisation of rain water is, therefore, of vital importance. Much of it flows down into the streams and rivers and ultimately finds its way to the sea. Incredibly large quantities of the precious fluid are thus lost to the country. The harnessing of our rivers, the waters of which now mostly run to waste, is a great national problem which must be considered and dealt with. Vast areas of land could be turned into fertile and prosperous country by courageous and wellplanned action.

The systematic planting of suitable trees in every possible place in one of the most urgent needs of India. Such plantation would directly and indirectly prove a source of untold wealth to the country. They would check soil erosion and conserve the rainfall of the country from flowing away to waste.

In one sense, water is the commonest of liquids. In another sense, it is the most uncommon of liquids with amazing properties which are responsible for its unique power to maintain animal and plant life. The investigation of the nature and properties of water is therefore, of the highest scientific interest and is far from an exhausted field of research.

- C.V. Raman

Water: The Elixir of Life" written by Sir C.V. Raman analyses and discusses in a clear, concise, and scientific manner the nature and properties of water and its significance in the life of human beings. Certain issues like soil erosion and the preventive measures which have to be adopted in order to control it, the need for afforestation, the promotion of internal waterways as a cheap and economical means of transport and the production of hydroelectric power are some of the points which have been highlighted and dealt with in this essay. One of the most prominent Indian scientists in history, C.V. Raman was the first Indian to win the Nobel Prize in science for his illustrious 1930 discoverv. now commonly known as the "Raman Effect".



SEMINAR on 'Draft Master Plan for Coimbatore' on 22nd March 2024

SIEMA had arranged for a Seminar on Draft Master Plan for Coimbatore. All members were invited. Sri. P. Kathiravan, Dean Faculty of Architecture, Design & Planning from Karpagam Academy gave his presentation. Vice President Sri. Mithun Ramdas on behalf of SIEMA, President KV. Karthik on behalf of COINDIA & Mr. Karthikeyan on behalf of Si'Tarc chaired the meeting. A good number of Members attended the Seminar. Members from other Associations also participated.



















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Experts share tips to safeguard yourself in sweltering conditions

As temperatures soar across India and heatwave-related deaths are reported in the northern state of Uttar Pradesh, it becomes crucial to prioritise our safety and adopt preventive measures to combat the scorching heat. A study published in The Lancet last year revealed a staggering 55 per cent increase in deaths caused by extreme heat in India between 2000-2004 and 2017-2021.

For the unversed, a heatwave is a prolonged period of excessively hot weather, typically accompanied by high humidity. It is characterised by temperatures significantly above the average for a particular region or time of year.

Dr Bikky Chaurasia, Consultant Internal Medicine, Kokilaben Dhirubhai Ambani Hospital Mumbai told indianexpress.com, "A heatwave is a prolonged period of excessively hot weather, typically accompanied by high humidity. It is characterised by temperatures significantly above the average for a particular region or time of year".

He added that in some countries, the definition of a heatwave takes into account the heat index, which considers both temperature and humidity or extreme percentile values of temperatures. "For plains, a heatwave is typically considered when the maximum temperature at a particular location reaches 40 degrees Celsius or higher, while for hilly regions, it is 30 degrees Celsius or higher," he said. If the departure from the normal average temperature during a heatwave is between 4.50 and 6.40 degrees Celsius, it is classified as a heatwave. If the departure exceeds 6.40 degrees Celsius, it is considered a severe heatwave.

How can a heatwave impact us?

Heatwaves can be dangerous and potentially life-threatening, particularly for vulnerable individuals such as the elderly, young children, and those with pre-existing health conditions. "The health impacts of heatwaves primarily involve dehydration, heat cramps, heat exhaustion, and heatstroke," said Dr Chaurasia.

The signs and symptoms associated with these conditions, shared by Dr Chaurasia, are as follows:

- *Heat cramps* are characterised by swelling and fainting, usually accompanied by fever below 39 degrees Celsius (102 degrees Fahrenheit).
- *Heat exhaustion* is marked by fatigue, weakness, dizziness, headache, nausea, vomiting, muscle cramps, and excessive sweating.
- *Heatstroke* is a severe condition where the body temperature rises to 40 degrees Celsius (104 degrees Fahrenheit) or higher, accompanied by delirium, seizures, or even coma. Heatstroke is potentially fatal and can lead to death.

"It's important to note that extreme temperatures can worsen existing cardiovascular, lung diseases, diabetes, and skin-related disorders," warned Dr Chaurasia.

Tips to take care during a heatwave

Dr Divya Gopal, Consultant, Internal Medicine, Sir H N Reliance Foundation Hospital, shared tips that can protect you against heatwaves.

- Drink extra fluids: To prevent dehydration, drink plenty of water, fruit juice, or vegetable juice per day. Because heatrelated illness can also result from salt depletion, it may be advisable to substitute an electrolyte-rich sports drink for water during periods of extreme heat and humidity. Use ORS, homemade drinks like lassi, rice water, lemon water, buttermilk, etc. which helps to rehydrate the body.
- *Have lighter meals:* When it is hot, food with high water content like fruits (strawberries/ oranges), cucumber, and lettuce will help you stay hydrated and cool.
- *Guidelines when exercising:* A general recommendation for those doing moderate to high-intensity exercise is to drink 17 to 20 ounces of fluid two to three hours before exercise, and consider adding another eight ounces of water or sports drink right before exercise. During exercise, you should consume another seven to ten ounces of water every 20 minutes, even if you don't feel thirsty. Also, drink another 8 ounces within a half hour after exercise. Take additional precautions



when exercising or working outdoors.

• Avoid fluids containing either caffeine or alcohol, because both substances can make you lose more fluids and worsen heat exhaustion. If you have severe heart, kidney, or liver disease, are on a fluid-restricted diet, or have a problem with fluid retention, check with your doctor before increasing liquid intake.

• *Keep and use a cooling spray* when you are outdoors in the heat.

• *Keep the curtains/blinds at home shut* during the hottest times of the day so that your home stays cool.

• *Never leave kids, older people or pets in cars.* The temperature inside a parked car can double within minutes.

• Seek out air-conditioned buildings, and take cool

showers at least twice a day. Wear lightweight, light-coloured, loose, and porous cotton clothes. Use protective goggles, an umbrella/ hat/scarfs, and comfortable footwear while going out in the sun.

- Schedule activities in the coolest part of the *day* and avoid exercising and being outdoors in the heat.
- Look after those most at risk in the heat – your neighbour living alone, the elderly, children, and people with a medical condition and don't forget your pets.
- *Watch for signs of dehydration* like dry mouth, dizziness, confusion, and headache- see a doctor immediately.

Source: 'The Indian Express'



SIEMA Magazine



Birds are very special animals that have particular characteristics which are common among all of them. For instance, all of them have feathers, wings and two legs. Similarly, all birds lay eggs and are warm-blooded.

They are very essential for our environment and exist in different breeds. This note on birds will take us through their importance.

Importance of Birds

Birds have different sizes and can be as small as 2 inches and as big as 2.75 metres. For instance, bee hummingbird (smallest) and ostrich (largest). Bird's existence dates back to 160 million years ago.

...Birds are significant for our

environment as well as for human

beings as they play an important

role in every living thing

present on earth.

There are different types of birds that exist which vary in characteristics. For instance, there are penguins that cannot fly. Further, there are birds that are known for their intelligence like Parrots and Corvidae.

Moreover, we have peacocks which are beautiful

and symbolize rain and good weather. Next, there are bats and vultures as well. Birds connect very closely to the environment and are quite intuitive.

They can predict the weather conditions and some are kept near coal mines for the prediction of a mine explosion. It is because they are sensitive to the release of high levels of carbon monoxide. They are quite social and enjoy singing as well. Birds enjoy the freedom of moving anywhere without boundaries.

Favourite Bird

Favourite bird for many is the parrot. It is a colourful bird that is present in many parts of the world. It comes in many shapes, sizes and colours. Parrots are famous for having vivid colours.

Some have a single, bright colour while others have a rainbow of different colours. Parrots are usually small and medium in size that mostly eats seeds, nuts and fruits. The lifespan of a parrot depends on its species.

Larger ones like cockatoos and macaws live for 80 years while the smaller ones like lovebirds live for around 15 years. In fact, parrots are quite intelligent. They have the

ability to imitate human speech which is why many people keep them as pets.

Consequently, they are also the most sought-after type of bird for commercial purposes. All over the world, people are taking measures to ensure parrots get nice treatment. Many cultures also consider them sacred.

Parrots are highly intelligent and thrive at their best when they are free and not captured in cages. I used to have a parrot when I was little and I never kept it in a cage. It used to sit on my shoulder wherever I went and never flew away. Parrots are my favourite bird.

Due to hunting, poaching and disruption of the ecological balance, many birds are becoming extinct. As a result, birds living in water like swans, ducks and more are also falling drastically in number because of pollution. Thus, we all must take proper measures to help the birds live and save them from extinction. Birds are vital for our ecosystem and its balance, thus we must all keep them safe.

We can save birds by doing little things like providing a source of water for them to drink. Further, we can elevate bird feeders and plant native plants and trees for them. Similarly, we can put up birdhouses and garden organically so that birds can feed on insects and worms.

We must keep in our mind that Birds are significant for our environment as well as for human beings as they play an important role in every living thing present on earth. Birds are one of the seed dispersers for plants who deliver us food, shelter and medicines and more.

Birds provide us food, medicine, fertilizers and also bring about pollinations. They are important because they are a part of the food chain. Birds are also important because they help spread seeds around and thus help with the planting process. Birds also perform vital ecological role, besides their economical role.

Birds improve our quality of life. Watching them flit around a backyard feeder or hop through the grass can be an entertaining diversion, a mood booster, and a window into animal behavior. Observing our avian counterparts offers connection to nature and a reminder that we coexist with wildlife. And there's more they do for us behind the scenes: We reap many benefits from sharing our planet with birds through what's known as "ecosystem services."

Ecosystem services include all of the positive benefits that natural systems provide. The term includes everything from the basic provisioning of food and oxygen, to more

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subtle perks such as the ways wetlands reduce storm and flood damage. Labeling these natural processes "services" makes it easier for ecologists and conservationists to quantify the value of nature (sometimes literally in dollars) as well as what we lose through environmental damage.

Birds make big contributions across habitats, and they're crucial for people and the planet to thrive. When avian species are lost, their particular functions and benefits disappear, too. And introduced species can't easily replace the critical roles of native ones, according to a new study published in Science Advances. That means holding onto the bird diversity we have is paramount.

You might already know about some of the ecosystem services birds provide, for instance pollinating your favorite fruits. Here are a few of the more surprising ways birds (metaphorically) keep the world turning.

Bird droppings, also known as guano, play a key role in spreading nutrients, and seabirds are particularly crucial. After months of eating fish and other sea creatures on the high seas, they visit land to nest in large colonies of hundreds or thousands. When seabirds bring their full stomachs ashore and poop, they concentrate nutrients at their coastal breeding grounds in enormous volumes.

In northwest Greenland, for instance, Dovekies come to land en masse every summer to breed. In doing so, they move an estimated 3,500 tons of nitrogen, an important nutrient for plants from the ocean to the soil. All that nitrogen boosts local grass growth in the normally barren Arctic habitat and feeds grazers such as hares, geese, reindeer, and muskox, which are hunted by people for food. Where there are Dovekies, muskox numbers are 10 times higher.

At one point in human history, big deposits of bird guano were so valuable as fertilizer for crops that Spain started a war over them. The advent of synthetic fertilizers means bird poop is no longer fought over, but as in Greenland guano deposits still support many ecosystems and people.

Birds' spore-spreading can keep entire forests healthy.

It's well known that birds transport seeds. They munch on their favorite berries, and then distribute seed-strewn droppings—ensuring that new plants continue to sprout up. Recently scientists have found that some birds also have a penchant for foraging valuable fungi. In Patagonian forests, Chucao Tapaculos and Black-throated Huet-huets are voracious truffle-hunters. Whenever they dig up a fungus, eat it, and hop to the next one, they move spores around and propagate a diversity of tasty mushrooms.

This does more than multiply the birds' food source: The truffles are actually the fruiting bodies of an intricate underground fungal network that keeps surrounding trees alive. The below-ground fungal filaments transport nutrients to the roots of trees in exchange for sugar.

The mutually beneficial partnership is the scaffolding that supports the whole forest system. Birds ensure it stays intact.

Birds are environmentally friendly exterminators

What birds eat is often just as ecologically important as where they poop. For example, many birds are voracious

as 60 insects an hour. Over an agricultural field, swallows rescue pest-prone crops and leave more food for us. And installing Barn Owl boxes on farms reduces populations of destructive rodents, like gophers. Similarly, putting up nest boxes for Western Bluebirds can save grapes on vineyards. In this way, promoting and protecting bird habitat is a great alternative to widely used, harmful pesticides.

predators of pests. Barn Swallows can consume as many

Avian construction crews create habitat

For birders, woodpeckers are doubly good news: a fine sight on their own, and home-builders for other cavitynesting species. Research has shown that cavity-nesters birds that build their homes inside tree hollows or other holes—do best when woodpeckers abound. In one recent Texas study, birds like titmice, flycatchers, and wrens were more likely to survive long-term if they built their nests in abandoned woodpecker cavities instead of those created by decay. Woodpecker-excavated holes afforded more access to tasty insects and offered better protection from predators.

Woodpeckers are so important for other species that monitoring them can tell scientists how the entire bird community is doing. They are environmental indicators: If woodpeckers are around, you can bet lots of other birds are, too.

They're the ultimate in animal sanitation workers

Vultures are the only vertebrate animals that eat carrion exclusively. (Other scavengers, like coyotes, also hunt for food.) Because vultures are so singularly focused, they're remarkably efficient at picking up the scraps. Research has shown that when vulture populations fall, the number of rotting carcasses on a landscape goes up—by a factor of 10 in a South Carolina study. In one Kenyan study, scientists noted that without vultures, carcasses took three times the standard amount of time to decompose. More rotting stuff means a higher risk of disease for humans and other animals. Next time you go on a hike and don't come across a dead deer, thank a vulture.

Some birds lend other species a leg (or wing) up

If you're still unconvinced that birds are here to help, consider that some directly assist other species—humans included. Greater Honeyguides live up to their name and range throughout sub-Saharan Africa: There, the brownand-cream-colored birds, which eat bees' wax and insect larvae, literally guide people to honey. In a well-documented quid pro quo, honey-hunting humans attract Greater Honeyguides through sound. (Different people around the continent have different communication cues they use to call honeyguides. The Yao community of Mozambique uses a distinctive trill. Hazda hunters in Tanzania rely on a whistle.) Then the birds lead them to hives.

It's an example of true teamwork. Hunters help the birds because they can more easily take down and disassemble a hive than a lone bird can. And following honeyguides lowers the amount of time hunters spend searching and increases their chances of finding a hive.

It's a striking example of a truth most avian enthusiasts already know: *Birds make life a little sweeter.*



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