



EE VISION

IEEE — UAE SECTION NEWSLETTER

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Chairman's Message



IEEE UAE Section's newsletter "EE Vision" is becoming more popular as time goes on. We are issuing our third edition of "EE Vision" hoping that it will reach a larger population of Electrical and Electronic Engineers who are becoming more aware of IEEE's positive contribution to the UAE society. The activities of IEEE UAE Section aim at spreading the awareness of the importance of electro-technology in the development of the country. The activities also aim at transferring, implementing and developing electro-technology in UAE. Through the activities of seminars, lectures, conferences, symposia and industrial visits, we are hoping to attract more members in order to participate in this awareness campaign. Due to the efforts of the Section's officers, the number of IEEE members has increased dramatically. Now, in our section, we have two technical chapters (Power Engineering Society Chapter & Computer Society Chapter,) three student branches (UAU Student Branch, AUS Student Branch & ECE Student Branch.) I would like to take this opportunity to congratulate Etisalat College of Engineering for recently forming a student branch. Moreover, I would like to invite all IEEE members and electrical engineers to participate in the forthcoming important event "10th IEEE International Conference on Electronics, Circuits and Systems (ICECS 2003)," which will be held in the University of Sharjah on December 14-17, 2003. The conference will be co-organized by the University of Sharjah and Etisalat College of Engineering. Please visit the following site for more information: <http://www.icecs2003.org/>.

Finally, I would like to invite all of you to enrich our activities either by attending the events or by participating in the organization of these events. Your contribution is important for the success of IEEE activities through which technical information and electro-technology are disseminated amongst electrical engineers.

Dr.Eesa Bastaki, Chairman, IEEE UAE Section

From the Editor's Desk:



Quality in Management

The concept of quality dates back to the human history. Thousand of years before Christ, ancient Egypt saw the introduction of 'The Book of the Dead' which may be considered as the first documented quality system on earth which contained detailed procedures that needed to be followed to prepare the body and soul for the after life. IEEE Code of Ethics highlights the importance of electro technologies in improving the quality of life throughout the world.

Quality system standards were evolved to achieve satisfaction of customers and improve the operation of organizations. Some of them are related to products or industry while some others generic. The generic standard like ISO 9000 applies to virtually any organization regardless of its size and the nature of the products or services. To be efficient and effective, the organization can manage its way of doing things by systemizing it. This ensures that nothing is left out and everyone is clear about their role and responsibility. QM standards provide the organization with a model to follow in setting up and operating the Management system. The more recent Total Quality Management (TQM) is based on management and employees working together towards quality and productivity and participating in problem solving efforts in an organization.

There is a growing awareness of Quality in management in this country. In a survey conducted last year UAE, was in the forefront of getting highest ISO certifications among Middle East and North African countries. At this juncture, let us remember the great words of John Ruskin that 'Quality is not an accident; It is the result of intelligent efforts'.

Eng. A.Suhair, Chairman, Newsletter & Publications

IEEE UAE Section Activities –2003

Meetings/Seminars

Environmental Management – Dr. Richard Perry (ERWDA) : 15th January 2003 at the Cultural Foundation, Abu Dhabi



The presentation began with an introduction to the broader environmental issues with an emphasis on the situation within the United Arab Emirates and moved on to look at the pressures on industry to "Go Green" and then focused on Environmental Management Systems as a tool for meeting the challenge.

The core tenet of the presentation was one of sustainable development and the responsibility each individual has towards achieving this. Some of the illustrations included examples such as: Every second, worldwide, an area of forest the size of a football field is destroyed, in the 45 minutes that it took to deliver the presentation therefore, an area the size of 2,700 football pitches was destroyed, much of it forever. Or Carbon dioxide emissions as a major issue that should be addressed, with figures of 36.7 tonnes of CO₂ per person per year within the UAE.

Having laid out some of the major issues the presentation then moved on to the costs and benefits to organizations of "going green", highlighting the pressures to go green and organizational ethics.

Finally as a possible tool to help organizations face these challenges, Environmental Management Systems (EMS) such as ISO 14001 were presented and the main components including Top Level Commitment and the need for an Environmental Policy and Transparency were described.

Power System Harmonics: Mohamed H. Shwehdi, Ph.D : 8th February 2003 at the American University of Sharjah

Power systems are designed to operate with sinusoidal voltages and currents. Non-linear loads are source for harmonics distort steady state AC voltage and current. The power quality of such voltage and currents is very essential. Automation of industrial systems is one of the main sources of harmonics. Harmonics are multiple of the fundamental frequency of voltage and current. Harmonic voltage on a power system, if large, may cause system over voltages resulting in the burning out of lights, damage machines, breakdown cable insulation, etc. As more and more VFD's, battery charger, PLC, controllers, and static var compensators are installed in power distribution facilities, the problems related to harmonics are expected to go worse. As such it's important that you're able to determine harmonic levels and analyze system data so that you can implement the corrective measures and avoid serious problem. The adverse effects of harmonics in electrical power systems are very real, and failures related to voltage and current harmonics very often occur without warning. The degree to which harmonics affect electrical power system components depends on several factors: physical location, installation practices, electrical loadings; and ambient temperatures.

Web Based Monitoring and Control of Industrial Plant : Dr. Abdul Rahman Al Ali

Held on 1 April, 2003: Ajman University of Science & Technology, Abu Dhabi Campus

With the significant advances in telecommunications, internet and computer technology it became possible to access, monitor and control distributed measurement and control systems via the World Wide Web. This presentation describes the typical hardware and software infrastructure to design and implement a fully industrial automation system that can be integrated with the readily available internet/intranet. The speaker stated that any functional web-based monitoring and control system must comprises of three tiers, namely instrumentation and measurements tier, client-server tier and software platform for data gathering, processing, displaying and communication. Rich legacy controllers-based systems such as PLC, SCADA and CNC can be interface without a lot of modifications. Engineers and technical operator can to monitor and control factory floor from local or remote distance on 7/24 bases.

Web-based monitoring and control is spanning many industries, including Boeing, Caterpillar, Cessna Aircraft, Dana, Detroit Diesel, Emerson Electric, Ford Motor Company, General Electric, General Motors, Lockheed-Martin.

Electrical safety of Medical Equipment – Dr. Hassan Al-Nashash

Held on 30th April 2003 : Dubai:



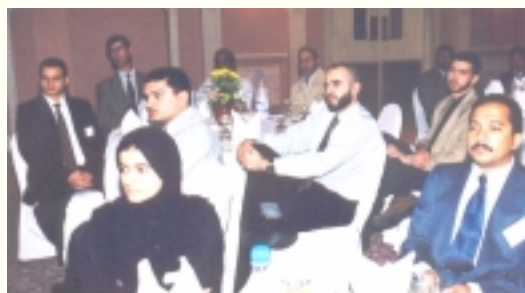
Electrocutions are the 5th leading cause of accidental death in the U.S. More than 700 people lose their lives every year because of accidents associated with electricity and electrical products. 40,000 residential electrical fires occur annually. More than 2 billion dollars is lost on property damage.

The increased use and complexity of medical systems result in 10,000 device related injuries in the USA each year. Hazardous sources include electricity, fire, water, chemicals, drugs, germs, x-rays, EM fields.etc. There are now performance standards that were written for medical devices- .Our main objectives are to understand the possible electrical hazards and fault scenarios and learn how to improve designs of medical instruments. The presentation dealt with the Physiological Effects of Electricity, Electrical Macroshock, .Codes and Standards, .General Design Recommendations, Equipment Safety Practices , Safety Testing etc.

Scenes from Annual General Meeting (AGM)-2002



From Left : Mr. Taj, Mr. Syed Riiaz, Dr. Eesa Bastaki, Mr. A.G.H. Lal



A section of the audience



AGM-2002 was held on Thursday 9th January 2003 at Hotel Holiday International, Buhaira Corniche, Sharjah.. About 100 members from various parts of the Emirates participated in the event . **Dr. Eesa Bastaki**, Section Chairman welcomed the gathering and presented the report. The accounts for the year was presented by Treasurer Er.K.S.Taj. Mr. Ibrahim Nasser read the report of the activities of the AUS Student Branch. Dr.Eesa presented certificates of appreciation to speakers and sponsors of previous events. **M/s International Turnkey Systems, UAE** hosted the event and a dinner thereafter.

Meetings/Seminars (Contd..)

Evolution of Mathematical Concepts through Ages – Prof. Ganti Prasad Rao, Fellow, IEEE

Held on 3rd June 2003 in the Cultural Foundation, Abu Dhabi



In this lecture Professor Ganti Prasada Rao started with the most fundamental elements of mathematical concepts- the number concept and the development of the Hindu-Arabic number system for quantitative characterization. He then made a striking note of analogy between the evolution of living organisms and that of mathematical concepts and proposed a genetic model for the latter in the spirit of the DNA structure. He showed that the 'genetic model' for a wide class of mathematical concepts is of the sum-of-products (SOP) form which arises from the Hindu-Arabic number system.

Like the double helix structured DNA, which generates a vast diversity of biological organisms through mutations of the subunits (A,T,C, and G), the SOP structure lends itself to the generation of a wide variety of mathematical concepts which in the case of mathematical representations starting from the fundamental number system through the mutation of the subunits that happen to be the evolutionary forms of the number concept itself, namely, integer (N), real (R), imaginary (I), and complex (C). Expressions of functions in the ordinary sense- periodic and series expansions, generalized functions or distributions, and integral transforms- both in discrete and continuous domains, are shown to emerge from the basic SOP structure by special combinations of the subunits N, R, I, and C. While discussing integral transforms, Prof. Ganti Prasada Rao showed how it is possible to deduce from the proposed framework, the well-known formula defining the Laplace Transform by specifying the desired relationship between operations (differentiation and integration) in time and frequency domains. The procedure involves the solution of a partial differential equation with appropriate boundary conditions for the kernel of the general formula for integral transforms.

Prof. Ganti Prasada Rao then considered the duality between 'product' and 'convolution' in the two domains of integral transforms and showed that it holds in all cases arising from this genetic structure. An interesting generalization of the terms such as BASIS, SPECTRUM, BANDWIDTH, TUNING, etc. which are referred commonly to signal representations, followed. Each of these is shown to have a broader meaning than the traditional one.

The lecture aroused much interest among the audience particularly for the connection that it revealed between the various mathematical concepts and the basic number concept and the profound Hindu-Arabic number system.

Industrial Visit to Thuraya Satellite Centre



As part of the IEEE UAE section industry interaction activity, a visit to the Thuraya Satellite Telecommunications Company was organized on May 21st, 2003. Thuraya is a leading company providing satellite-based mobile phone services to nearly one-third of the globe. Their primary gateway station is located in Al Dhaid close to Sharjah.

The visit included a tour of both the ground and space segments, where Mr. Yousif Al Doubi, Senior Engineer at the Gateway Station, explained the different components of the Thuraya system that are responsible for connecting mobile phone users to any point across the globe. Thuraya engineers also explained the range of services provided by the system including voice, data, fax, and internet access. Finally, IEEE members experimented with a live demo of the system by placing a voice call and testing the quality of the service. Many technical and business questions were raised

by the participants that were adequately answered by Thuraya engineers. The tour was well organized and Thuraya presented souvenirs to all participants.

From the Secretariat



The Annual General Meeting held in Sharjah on 9th January 2003 was fitting finale for the activities of 2002. Nearly 100 members all over the emirates attended the AGM. The AGM honored many organizations and persons who contributed to the cause of IEEE in UAE.

During the first half of this year, six technical talks and an industry visit were organized. Compared to last year, the turn out for this year for the technical talks is highly encouraging. Three lectures were conducted in Abu Dhabi, two in Dubai and one in Sharjah. We are grateful to UAE Society of Engineers who joined hands in conducting Abu Dhabi programs. Even though the visit to Thuraya was organized on a working day, the response was more than what was expected.

Petitions were forwarded to the HQ for the formation of Women in Engineering Affinity Group and a Sub Section in Abu Dhabi. The formation of GOLD Affinity Group is in the anvil. These steps are expected to ensure wider participation and impart momentum to our activities. The two chapters – Power Engineering Society and Computer Society - of the Section are very active. The Section is considering many innovative programs in the coming months. The current membership of the Section is 400.

A.G.Hareendralal, Secretary, IEEE UAE Section

IEEE News—From Far and Near

IEEE PES Online Magazine

IEEE Power & Energy Magazine is now on line. Members can access it through the PES Home Page at <http://www.ieee.org/power>

Women in Engineering Affinity Group

IEEE HQ communicated the approval of the formation of Women in Engineering Affinity Group under the UAE Section with Ms. Maryam Al Thani as the interim Chair of the Group. WIE Scope includes gathering and disseminating information regarding the status of women and initiatives for, by and on behalf of women in engineering and science, increased participation of women in IEEE and address ways to improve the climate for women in IEEE and work places. We wish the new Group all success in their functioning.

New IEEE Student Branch at Etisalat College of Engineering

The third IEEE Student Branch was formed at Etisalat College of Engineering, Sharjah. Dr. Mahmoud Al-Qutayri is the IEEE Student Branch Counselor and Mr. Nawaf Almoosa is the Student Branch Chair.



IEEE Student Activities

Mr. Wael M. Halalo, a student at Sharjah University and student member IEEE, has his Junior Design Project accepted for publication by the IEEE Transactions on Education. Mr. Wael's junior design project was concerned with synthesizing arbitrary piecewise-linear current-input current-output nonlinear functions using the Static Translinear Principle. He has developed new cells using both bipolar and Mos transistors to realize programmable-slope current amplifiers. The project was supervised by Dr. Ahmed S. Elwakil.

Points To Ponder..

A pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty. – *Sir Winston Churchill*

As for courage and will - we cannot measure how much of each lies within us, we can only trust there will be sufficient to carry through trials which may lie ahead. - *Andre Norton*

Action springs not from thought, but from a readiness for responsibility. - *Dietrich Bonhoeffer*

Do not go where the path may lead, go instead where there is no path and leave a trail. - *Ralph Waldo Emerson*

We must remember that one determined person can make a significant difference, and that a small group of determined people can change the course of history. – *Sonia Johnson*