RESTRICTED CIRCULATION

The Indian Engineer

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Message from the Chairman

Unprecedented situation caused by the corona-virus outbreak has also taken a heavy toll on economic activity which has come to a near halt. This is causing a lot of suffering to all persons, including engineers, many of whom have lost livelihood. Engineers are supporting the efforts of the Government in tackling the situation in the best possible manner. ECI is making representations to government to look into the issues related to sufferings of engineering professionals.

To encourage the human effort to fight this corona war, Marico Innovation Foundation (MIF), well known for promoting and supporting purposeful innovations in all walks of life for nearly 20 years now, has spontaneously jumped in to help. Dr. R Mashelkar has brought to our notice that Mr. Harsh Mariwala and Mr. Amit Mitra have created this Innovate 2 Beat COVID grand challenge under the auspices of MIF. It has this generous prize money of Rs 2.5 crore. The idea is to Ignite the creative capabilities of confident Indian innovators, who will rise to the challenge of providing novel solutions which are affordable, simple, safe, scalable and sustainable. ECI has communicated this opportunity to all Members, colleges and Universities for response.

Despite this crisis situation, the efforts of ECI and Member Associations have to continue which may help in reviving the economy. When it becomes possible, the Internship programmes need to be organised so that fresh pass-outs to gain professional and practical skills so as to of use to the Indian industry.

ECI had circulated a brief guideline on internship of Graduates and Diploma holders based on the New Guidelines issued by AICTE in February 2019, not only to create awareness but also to also to generate actionable ideas which can be implemented by Member Associations and colleges/ universities.

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Contd. from Page 2 (Message from the Chairman)

Another area where we need to continue efforts is the registration of Professional Engineers who also get share of the fee. It was decided that ECI could join hands through MoU route with non-member organization who can promote registration of PEs. ECI signed MoU with CPWD on 11.12.2019. This activity needs to be accelerated so has to have a critical mass of Professional Engineers which can be available for efforts relating to economic revival.

Thirdly, ECI has offered to AICTE approved/other engineering colleges/ institutes/universities facility to get Affiliate Status of ECI which would help them in their interaction with students. Academia and industry. The Affiliate Institutions can use ECI Affiliate Logo and brandings, apart from availing the benefits of (a) Interaction with Industry, (b) Organizing business, conference, & workshops, (c) conducting joint research programs or jointly take up consultancy projects, (d) Interaction with domestic and overseas peer groups and (e) Exchange programs for faculty and students etc. Recently, six colleges and institutions have ECI's Affiliate Status, in addition to 6 institutions have reported in the December News Letter.

All these activities would also bring revenue to MAs who need to become more active. ECI is always ready to help and support MAs and as may be needed. I would welcome suggestions from MAs regarding other initiatives to be taken by ECI which the MAs will support.

Please take care and protect yourself always.

(Uddesh Kohli)

From the Editor's Desk

Smart Cities, an Engineering Challenge

(Part-3)

In this part, this paper will discuss Current tech for mapping underground utilities. The immediate need is to bring positioning and underground detection tools together to provide accurate location for underground infrastructure. The demand for this technology tend to be from high-end, like utilities water, telecommunication, transport (underground metro) and government mapping agencies.

Industry standard tools available are :

- The industry standard tools are electromagnetic (EML) detection wands (for example, the Leica DIGiSYSTEM and Leica ULTRA) that can be combined with a signal generator to detect conductive pipes and cables. These wands use several frequencies to detect shallow and deep infrastructure, but they are basically 2D locators. They are effective and simple to use for detecting underground infrastructure as long as it is accessible and conductive (so as to be able to induce a signal in the pipe or cable).

- GPR (Ground Penetrating Radar) devices (for example, the Leica DS2000) can detect not only nonmetallic objects, but also provide 3D location (reporting depth as well as X, Y location). This makes GPR a superior mapping technology to EML wands. When combined with GNSS locators, GPR can accurately determine the geolocation of

underground infrastructure in 3D. The use of GPR has become almost mandatory in the water industry, which is increasing its use of plastic piping (Though GPR is not particularly good at detecting the plastic pipe itself, it detects the contents of the pipe such as water). But GPR does have drawbacks. The most important is that it requires an expert, typically a trained geophysicist, to interpret the scans. To make it possible for non-expert professionals to use GPR, Leica Geosystems, the DX Office Vision Utility Post Processing software can be used. This enables users with minimal training to extract pipes and other infrastructure from GPR data into a CAD drawing.

- Second, current devices are intended to operate at a walking pace, making GPR inefficient compared to mobile laser scanning, for example. In addition to bringing detection, positioning, and data sharing together with "one button" simplicity for non-expert professionals including surveyors and geospatial professionals. In addition, identifying the type of utility (water, electric, fiber optic) generally requires supplementary information from other sources. In some soil types such as aggregate and clay GPR does not perform well.

- In 2016, Hexagon has announced a major technology, the towable Pegasus: Stream array. Designed to be towed by a vehicle at speeds up to 15 km/hr (though 5-10 km/hr are more typical), the device provides simultaneous above and below-ground 3D scanning. It includes a mobile laser scanner with laser scanners, optical cameras and GNSS receivers (Leica Pegasus: Two) for above-ground features and a Stream EM GPR array for below-ground objects.

Stream EM GPR Array Device and Scanner

Hexagon's IDS GeoRadar division has also just introduced the Stream C, a compact GPR array solution for real-time 3D mapping of underground utilities. This solution comes equipped with software for automatically mapping underground infrastructure. A massive antenna array with two polarizations provides an increased level of accuracy, and together with software for tracing signals across multiple scans, the system automatically detects and locates the position of pipes in real time and displays them on screen. The system can be towed manually or with a small vehicle, increasing the acquisition speed up to 6 km/h.

- Third Option of available Technology is real-time collaboration between field staff and the office so that above and below the ground surveying can occur simultaneously. Leica DX Manager provides a single dashboard for users of underground detection systems like the DS2000, GIS collectors, and GNSS positioning systems to manage spatial data, tasks, and field teams. The platform allows users to locate, map and share subsurface utility information simultaneously. For example, DS2000 users can

integrate location data including depth measurements with GNSS measurements. This makes it possible to have field operators with limited training and experience to collect data that is viewed and interpreted in real-time by geophysical experts in the office.

DX Manager

This involves integrating other technologies and is analogous to multi-sensor scanners such as the Pegasus: Two and the Pegasus Backpack, which include laser scanners, photo cameras, and IR cameras. Location and condition data would be very helpful to utilities in prioritizing their maintenance work.

Right now, there is vast duplication of such mapping/ detection because each utility and communications company does its own scanning and potholing and the data collected is rarely shared. This issue was discussed in detail in part II of this series.

In part IV, we will discuss about the technologies for underground infrastructure development and maintenance including the trenchless technology.

(JL Narayan)
Executive Director, ECI

ECI NEWS

ECI is organizing Eminent Engineers Award function scheduled for April 07, 2020 at Conference Hall, UNESCO House, 1, San Martin Marg, Chanakyapuri, New Delhi-110021 postponed due to COVID19 Lockdown guidelines, promulgated by the Government.

The following 6 Institutions have Affiliate Status of ECI :

1. BMS Engineering College, Bull Temple Rd, Basavanagudi, Bengaluru, Karnataka-560019.
2. HKBK College of Engineering, 22/1, Nagawara, Bengaluru-560045.
3. Northern India Textile Research Association NITRA Technical Campus, Sector-23, Rajnagar, Ghaziabad-201002.
4. Sphoorthy Engineering College, Nadergul (V) Balapur (MDI), R.R.(Distt) Hyderabad–501 510.
5. Kakatiya Institute of Technology & Science for Women, Village Manikbhandar, MC: Makloor - Distt. Nizamabad-503003, Telangana State.
6. Bharath Niketan Engineering College, Shri Gowri Nagar, Thimmarasanaickanoor, Aundipatti, Theni (DT). Tamil Nadu-625536.

ECI continued dialogue with these institutions for collaboration in engineering activities, internship and knowledge upgradation programs. They have requested explore about the development projects around their neighborhood where ECI with its technical pool and Affiliates can work together.

Registration of Professional Engineers

1) Introduction

Registration of Professional Engineers, Associate Professional Engineers, Student Engineers, and some other categories on a voluntary basis is going on since December 01, 2015.

Member Associations (MAs) have a major role to play as they call for applications, screen them through their set up National Committees (NCs) for respective fields/disciplines of engineering. These NC give their recommendations to the Board of Registration of Professional Engineers (BRPE) set up by ECI.

2) Benefits of Registering

The Registration, enhances the credibility and image of the Engineer. His/her acceptance by industry, institutions, clients and other organisations goes up when he/she mentions the fact of this registration as PE (or APE or SE) which distinguishes him/her from those who are not registered. We are informing the various government departments, public sector organisations, local authorities, industry associations regarding the National Register.

Specifically, it will result in; (i) Better credibility and possibility to make use of the branding of ECI and concerned Member Associations, as the names are being listed on the website (ii) Using the Certificate of Registration as PE in the National Register as a part of CV, and (iii) Better prospects for assignments/jobs after this is publicised to client/employer organisations.

3) National Registers

There are separate National Registers for (i) Professional Engineer (P.E), (ii) Associate Professional Engineer (APE), (iii) Apprentice/Graduate Engineers (ApE), (iv) Junior Apprentice Engineer (JrApE), (v) Student Engineer (SE) and (vi) Diploma/B.Voc Student Engineer (DiSE). There are separate National Registers under each category for different engineering fields/disciplines: Construction, Consulting, IT, Computers/Telecom/Civil/Electrical/Mechanical/Chemical/Mining/Meta llurgy/Industrial/Aeronautical Engineering, etc. The details and Criteria for registration under each category, Disciplines and Code of Ethics which the applicant has to sign, are given on the website www.ecindia.org.

4) Categories and Fee

Initial registration fee is Rs. 3000 for PE, Rs. 2000 for APE, App. E & Jr. App. E and Rs. 1000 for SE plus applicable GST. And for other categories, the fee is Rs. 2000. plus the applicable GST. The fee structure is subject to change in future. The registration is subject to renewal after 5 years.

5) Continuous Professional Development (CPD)

Each PE/APE is expected to meet minimum CPD requirement before being considered for registration or renewal of registration. Nature of the programmes constituting CPD activities and credit hours to be earned are given on the web site www.ecindia.org. It is the aggregate of credit hours earned in 5-years that will determine as to whether a PE has secured at least 250 credit hours within his/her five years' registration validity period or not, for re-registration. MAs have a major role in organizing the CPD programmes for respective disciplines.

News from Member Associations

ACCE (I)

Postponement of Acce (I) Awards Function at Chennai

ACCE(I) 'awards function' planned as part of 'foundation day-ACCE (I)', which was scheduled to be held in Chennai between 22nd and 23rd, May-2020 has been postponed indefinitely and future date and venue shall be announced later in consultation with GC/Office Bearers of ACCE (I), when the current situation.

The Association of Consulting Civil Engineers (India) [ACCE(I)] is conducting the Third International Conference and Exhibition on Forensic Civil Engineering (FCE-2020) for three days on 3, 4 and 5 August 2020 at NIMHANS Convention Centre in Bangalore, India.

Recent Developments in Design and Construction Technologies

Urban Challenges and Civil Engineering Opportunities become normal across the country. For the detail please visit at https://www.acce.in/?p=33441

A CPD Accredited Programme on 27th and 28th February 2020 at NIMHANS Convention Centre, Bengaluru-560 029 was conducted successfully.

Broadcast Engineering Society (I)

BES organized 26th International Conference on Broadcast and Media Technology from February 13-14, 2020 at Pragati Maidan, New Delhi. For more details please visit http://www.besindia.com/

Construction Industry Development Council (CIDC)

CIDC organizing online Executive Development Program on Project Risk Management on April 27, 2020, Project Management in Green Building on April 28, 2020, Trenchless Technology & Subsurface Construction on April 29, 2020 and Time Management & Leading Change on April 30, 2020. For more details please visit http://www.cidc.in/CIDC_Online_EDP.html

Consulting Engineers Association of India (CEAI)

In continuation of the first Lecture series held from August 2018 to January 2019, CEAI is organising series of six monthly lectures at Indian International Centre, Lodhi Road New Delhi from January 2020. The first Lecture held on 22nd January 2020 at India International Centre, New Delhi. The topic of the lecture was 'Role of Standards and Certification for Quality'.

Consulting Engineers Association of India is organising a Seminar on 'Water Infrastructure for Urban Areas & Industries' on 13-14 February 2020 at Bhubaneswar. The seminar will be organised in partnership with Kalinga Institute of Industrial Technology (KIIT), Bhubaneswar.

The Service Export Promotion Council (SEPC), of the Ministry of Commerce and Industry (MOCI), Government of India (GOI) and the Consulting Engineers Association of India (CEAI), jointly organised the 'Workshop on Global Vision 2030 - Engineering & Construction Services on 28th January 2020 at the Royal Plaza Hotel, New Delhi. For more details please visit https://static.ceai.org.in/uploads/2020/03/CEAI-NewsLetter-JAN-2020.pdf.

Indian Association of Structural Engineers

IAStructE is organizing Refresher Course on "Application of New Seismic Code for Highway Bridges - IRC:SP:114-2018" in Mumbai, starting from 07 March 2020, which will be concluded on 11th April 2020. The Course is Supported by IE(I) - Belapur Local Centre. It will be a 24 Hrs course. For more details please visit http://www.iastructe.co.in/

Global Chemical Application Conference in Oil & Gas Industries will be held on 29, 30 May 2020 in Mumbai.

Website: http://www.gcac.co.in, Email: jyoti@confergoevents.com

Indian Institute of Chemical Engineers (IIChE) has taken an initiative to provide online summer training (4 weeks) to the UG students of Chemical Engineering and/or allied discipline under this prevailing crisis lock down period due to Covid-19 Pandemic. The academic calendar for the present semester is uncertain and it is very difficult for the students to do on-site summer internship in this critical situation. Therefore, AICTE advised to student for online summer training as an alternative option.

In view of this, IIChE is going to provide online summer training on various topics related to the chemical engineering curriculum including process safety management, petroleum refinery, petrochemicals, energy audit, and chemical process technology, zero discharge liquid management, 6-sigma training, and biochemical process plant. The online training will be provided by the eminent experts from the different esteemed industry and/or academia. Moreover, the organizational members of the institute (https://www.iiche.org.in/pdfs/IIChEOrg_Memb.pdf) would also take part in this training program.

SCHEMCON 2020 will be held on 11 and 12 September 2020 at Perundurai, to be organised by the IIChE Students Chapter, Dept. of Chemical Engineering, Kongu Engineering College, Perundurai, Tamil Nadu. Website: http://www.SChemcon2020.co.in

CHEMCON 2020 will be held during 27 to 30 December 2020 at Bhubaneswar, to be organised by Bhubaneswar Regional Centre, IIChE. Website: http:// www.Chemcon2020.com

The International Association for Bridge and Structural Engineering (IABSE)

The IABSE 2020 Congress which was supposed to take place on 2-4 September 2020 is now rescheduled to take place on February 3-5, 2021.

Indian Society for Technical Education (ISTE)

22nd ISTE Students National Convention planned at Goa postponed due to Corona Virus.

Indian Society for Agriculture Engineers (ISAE)

54 Annual Convention of Indian Society of Agricultural Engineers (ISAE) and International Symposium on "Artificial Intelligence Based Future Technologies in Agriculture" 7-10 January 2020 at Pune.

The Aeronautical Society of India

ASI, Kolkata branch organized an International Conference on Aviation Technology-Current Scenario on Aviation Technology-Current Scenario on 6th to 7th Mrach 2020 at Techno Main Saltlake Sector V, Kolkata. For details please mail to aesi.kolkata@gmail.com.

Institute of Marine Engineers (India)

All courses (Modular courses, Preparatory courses, Simulator & Competency courses) stand suspended from 16.03.2020 till further orders. For details please visit http://www.imare.in/

There are difficulties in obtaining Information Member Associations, mainly due to COVID 19 Lockdown. The website of some Member Associations is not updated and some are not working.

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