News Letter-2018

INDIAN INSTITUTE OF CHEMICAL ENGINEERS

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INDIAN INSTITUTE OF CHEMICAL ENGINEERS

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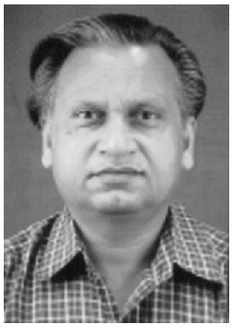
PRESIDENT'S CORNER

Hello Dear IIChE Members and Colleagues

My Season Greetings to you and yours families!



It has been really a pleasure for me to address you through all the four issues of IIChE News Letter in 2018. I did get responses on these Presidential columns through different social media. But they were very few in number. The comments, views and reactions from Members are always welcome for further discussions or debates on various issues to reach at implementable and executable conclusions.

In continuation to my previous columns pertaining to various challenging issues on some of our main activities, I would like to bring into focus some more associated issues. I look forward to your constructive opinions on these matters.

AMIIChE Examinination: The AICTE and the MHRD are in the process of making guidelines and setting time status for Associate Membership (AMIIChE) Examination of IIChE and similar such examinations, being conducted by various other professional bodies/organizations. Issues, such as, Points/grade allocations to various theoretical and practical projects, being conducted by approved regular, private and government colleges are under scrutiny by AICTE and the data pertaining to those have already been submitted. The IIChE along with other organizations are trying their best to get the Government notifications and approvals. But, at the same time, it is of utmost importance that the Regional Centres should enter into MOUs with companies and institutions so that such candidates can do internships / projects for learning the practical aspects of Chemical Engineering while doing the AMIIChE course.

Undoubtedly, the regular theory classes, currently conducted by a few RCs, are helping students to clear the theory papers. But it should be done with more professional touch, conforming to the IIChE status. The Controller of Examination of the IIChE Council along with the Vice President (IIChE) may have a direct communication with the RCs, which will play a pivotal role not only for conduct of the AMIIChE examinations but also in motivating more and more practising diploma students towards taking up AMIIChE course.

The IIChE HQ revenue is largely dependent on the AMIIChE examination fees. Hence, a reformed model to conduct the total AMIIChE examination affair is the need of the hour for IIChE.

Finance and Administrative Management: The Institute, with its 41 Regional Centres and 155 Student Chapters spread all over India, is functioning with one PAN. In spite of all the initiatives, actions and reminders every year, a few Regional Centres always default in submitting the accounts. As a result, these RCs are temporarily suspended till accounts finalizations by them and the suspension is revoked once the complete accounts are received by the HQ. Please note that barring the HQ and a few RCs, there is no regular staff in most of the RCs and the offices are being managed by the honorary services of the elected members. In spite of all sincerity and efforts, the tax management and GST implementation in totality is still a tough task ahead of us. This certainly calls for a collective understanding towards sharing of responsibilities between the RCs and the HQ. This can be achieved with a better dedicated, professional as well as ethical approach.

The recruitment process along with knowledge /skill upgradation of senior and retiring employees of IIChE HQ could not take off due to various reasons beyond our control. But certainly improper planning /Vision and the resorting to the easy path of granting extensions to retiring employees are also responsible. These

measures may help only temporarily but the sustainability and growth of the Institute will require more sincere efforts in a cohesive way on part of the HQ officials and Staff.

For the last 10 years or so, the financial management of events like **CHEMCON** and **SCHEMCON** and post-event management of surplus fund have been drawing attention of the IT officials. The tax consultants and the auditors associated with the Institute need to be more vigilant as to how to prepare the balance sheet so that the hard earned funds can be better used in the growth of Institute rather in paying taxes. The tax exemption clauses /permission are to be regained as done in the past. The corpus funds created for R&D, Building repair, Publications, Awards, Membership, etc., at the RCs and HQ need to be utilized regularly and cautiously by means of collective planning. The balance sheet of surplus from the big annual events should be prepared after deduction of the support expenses from RCs, the HQ and the Institutes / Colleges, etc., involved in organizing such events.

The timely submission of account is the essence of keeping everything intact and orderly as per the law and rules. The delays create suspicion and calls for explanation, putting individuals in an embarrassing situation in spite of their good intentions. Observation of the guidelines on purchases with proper and sufficient number of quotations is also equally important for any professional Institution.

Constitutional Amendments: Suggestions were invited and are always welcome to improve the overall functioning of the Institute with more transparency using modern gadgets of the digital era. The recent conduct of the 'Council Election 2018' and 'AMIIChE Examination' with the help of these measures has not only saved in the expenses but also reduced the possibilities of any malpractices. We wish to bring forth these amendments through 'Resolutions' in the AGM 2018, scheduled to be held during the IIChE Annual Congress at Jalandhar.

SCHEMCON 2018 was successfully concluded at ICT, Mumbai and the preparations for CHEMCON 2018 is in full swing at NIT Jalandhar. Names of recipients for the Life Time Achievement Awards as well as Memorial and CDS lecture awardees have been finalized and so also the recipients of various other awards, instituted by IIChE. They have been informed and requested to grace the occasion through their presence at CHEMCON to accept the awards. Finetuning of the overall programme, including the inaugural and valedictory function, is in progress. The newly elected members of the Council 2019 have also been intimated and invited to **CHEMCON 2018** and council meetings, scheduled during the Annual Congress 2018.

I, on behalf of my Council, invite you all to participate in CHEMCON 2018, to be held during **December 27th -30th 2018.** We welcome you and your family for a happy stay at Jalandhar and also convey our **Best Wishes for Happy & Prosperous New Year (2019).**

With Kind Regards,

Prof. Vinay Kumar Srivastava
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SCHEMCON 2018

The 14thAnnual Session of SCHEMCON in 2018 was organized by the IIChE Student Chapter at the Department of Chemical Engineering, Institute of Chemical Technology (ICT), under the aegis of the Mumbai Regional Centre, IIChE on 26 and 27 October 2018. The inaugural function started with the presence of Prof S. Basu, Director, Institute of Minerals and Materials Technology (IMMT), Bhubaneswar as the Chief Guest and Prof. G.D. Yadav (Vice Chancellor, ICT) as well as Prof. V.K. Srivastava (President, IIChE) as other dignitaries. Dr. Parag Gogate, Organizing Secretary, SCHEMCON 2018, compéred the inaugural function. The welcome address was delivered by Prof. A.W. Patwardhan, which was followed by an address by Prof. Srivastava. Prof. Yadav gave a brief introduction about activities of ICT. Prof. Basu, in his address to the participants, explained the concepts of Material Science and Mineral technology. Vote of thanks for the inaugural session was given by Mr. P. K. Saxena.

In all, 586 entries were received from Undergraduate (UG) students with additional 12 entries from Post-graduate students conducting research work as well as professionals working in the industry. Participants in the UG category comprised students from Maharashtra Academy of Engineering; Maharashtra Institute of Technology; D J Sangavi College of Engineering; Datta Meghe College of Engineering; Gharda Institute of Technology; ICT Mumbai; BV Raju Institute of Technology; Pandit Deendayal Petroleum University; NIT Raipur; NIT Durgapur; TKM College of Engineering, Kollam; Pravara Rural Engineering College, Loni; etc. Participants in Post-graduate category were from BITS Pilani; DY Patil University; IIT Bombay and ICT Bombay.

After the inaugural ceremony, parallel oral sessions were conducted on topics in the areas of Wastewater Treatment, Process Intensification, Renewable Fuels, Plastic and Polymer, CFD, etc. Parallel sessions were judged by IIChE Council Members, ICT faculty and industry experts. Two poster Sessions, each comprising 45 posters, were also organized.

Different invited keynote lectures or the Masterclass lecture series was a special feature of this year's SCHEMCON. Prof. J.B. Joshi delivered the first lecture on 'Economic Developments through Science', mainly based on the innovative

applications of multiphase reactors. The second master lecture was delivered by Mr. Rajendra Narkhede (Senior VP, Gexcon) on Chemical Safety and the third lecture was delivered by Prof. G.D. Yadav on the Green Chemistry and Engineering. A panel discussion was held on 'Opportunities for Chemical Engineers / Technologists' with panelists as Prof. A.B. Pandit, Prof. P. K. Ghosh, Dr. M.G. Palekar, Dr. Sanjiv Katti and Mr. D.P. Mishra. Prof. Pandit spoke on Academic Opportunities and Required Basic Engineering Concepts. Prof. Ghosh spoke about CSIR Institutes and Opportunities to Work in CSIR Laboratories. Dr. Palekar spoke about Process Engineering Avenues and Dr. Katti highlighted the Avenues in Industrial R&D. Mr. Mishra highlighted the concepts of Process Design and Engineering. After the panel discussion, a Cultural Night was organized by the Cultural Group of ICT, Mumbai.

Prof. M.M. Sharma (Padma Vibhushan Awardee & Past Director, ICT Mumbai) was the Chief Guest for the Valedictory Function. He was introduced by Prof. Yadav. Prof. Sharma spoke on 'Emerging Scenario in Chemical Industry'. During the valedictory functions, different awards were presented to the winners from SCHEMCON 2017. The winners from different sessions of SCHEMCON 2018 were also felicitated. From each of the Oral and Poster sessions, two winners were selected, based on evaluation made by the judges. M P Chary Award was presented to Mr. Nitin Thombre. Merit certificates were handed over to the participants by Prof. Sharma. The valedictory function came to an end with the vote of thanks by Dr. Parag Gogate, Organizing Secretary, SCHEMCON 2018.

Obituary

With profound grief, we announce the sad demise of our following Members:

Dr. S.K. Mukherjee (LF 00118): A Member since 1953, Dr. Mukherjee passed away at 91 years of age.

Mr. B. Bhattacharjee (HF 03487): Former Director of Bhaba Atomic Research Centre (BARC) and Member of IIChE since 1973, Mr. Bhattacharjee passed away at 76 years of age.

Dr. N.D. Ganguly (LM 05079): A Member since 1978, Dr. Ganguly passed away at the age of 81 years.

Dr. P.S. Sankara Rao (LM 05458): A Member since 1978, Dr. Rao passed away at the age of 73 years.

Prof. U.P. Ganguly (LM 01054): A Member since 1972, Prof. Ganguly passed away at the age of 78 years.

Prof. C.M. Laxmanan (LF 00738): A Member since 1962, Prof. Laxmanan passed away at the age of 82 years.

We offer our heartfelt condolence to the bereaved families of our departed Members.

REGIONAL CENTRE ACTIVITIES

Ankleshwar Regional Centre

Date: 1 November 2018
Event: Industry Visit

A visit to the plant of Lupin Ltd. at Ankleshwar was organised for 49 students of Chemical Engineering from SNPIT, Umrakh, Bardoli along with faculty members.

Date: 17, 18 December 2018
Event: Industry Visit

As a part of the 'Course on Wheels' programme, Chemical Engineering students of IIT-Mumbai visited GNFC Ltd, Bharuch, which was organised by Ankleshwar RC.

Coming Event:

23, 23 February 2019: A Seminar will be held on 'Innovative Technologies in Chemical Industries'.

Annamalai-Neyveli Regional Centre

Date: 12 December 2018
Event: Workshop (PEACE–2018)

Topic: Pollution-free Environment and Chemical Engineering

Inaugurated by Prof. V Murugesan, Vice-Chancellor, Annamalai University, industry experts and academics spoke on different themes related to the central topic. Mr. R. Stalin, Regional Business Manager, KONSPEC, Mangalore, delivered lecture on 'Biodegradable Products'; Mr. V. Balamurugan, Enviro Services Pvt. Ltd., Chennai, spoke on 'Bio-plastics in the Market Today'; Dr. S. Arrivukkarasan, Assistant Professor, Department of Chemical Engineering, Annamalai University, spoke on 'Towards Cleaner Environment'; and, Mr. Ramasubbu, District Environmental Engineer (DEE), Tamilnadu Pollution Control Board, Nagapattinam, spoke on 'Banned Plastic Items and Its Alternatives'.

Calcutta Regional Centre

Date: 2 November 2018
Event: Dr. H.L. Roy Birth Anniversary Celebration

130th birth anniversary of Dr. H.L.Roy was celebrated with customary solemnity. On the occasion, Sati Chatterjee , President , National Council of Education (NCE), presented a talk on 'National Council of Education Bengal, Jadavpur University and the Idea of Liberal Education'. In addition to CRC members and a large number of student members, representatives from NCE Bengal, Jadavpur Alumni Association and Chemical Engineering Department of Jadavpur University attended the programme.

Date: 7 December 2018

Event: Workshop

Topic: Process Safety Management – Hazards & Safety Assessment

The programme comprised 3 technical sessions, followed by a concluding session. Mr. C.K.Tewari, ED, Haldia Refinery, Indian Oil was the Keynote Speaker. Speakers for Technical Sessions were industry representatives. The workshop was attended by more than 80 delegates, out of which 60 were from different industries.

Hyderabad Regional Centre

Date: 8 October 2018
Event: Lecture

Topic: Gas Liquid Reactions - A new approach for Regime Identification and Development of Criteria

Held in association with University College of Technology Osmania University (UCT OU), the lecture was delivered by Prof. D.P. Rao, Former Head, Department of Chemical Engineering, IIT Delhi.

Kochi Regional Centre

Date: 29 November 2018
Event: Training Programme

Held on the theme 'Practical Approach towards Efficient Operation of Industrial Plants', the programme was attended by around 60 delegates from various organisations, such as, BPCL, IREL, TCC, HIL, SudChemie, Carborandum Universal, and ISRO. Lectures on furnaces, HSE in industry, instrumentation and pumps & compressors were delivered by industry and academic experts. At the end, certificates were given away to the participants.

Date: 2 December 2018
Event: Quiz Programme

On the occasion of the anniversary of Bhopal Gas tragedy, Inter-Oil Company, Health Safety Environment (HSE) Quiz competition was organised. It was inaugurated by the Chief Guest, Mr. Prasad K. Panicker, ED, BPCL. More than 32 teams from the major oil companies, including, IOCL, BPCL, HPCL, Petronet, and Reliance Total, participated in the quiz. The trophy, named, BPCL-Kochi Refinery Golden Jubilee Ever Rolling Trophy, was bagged by BPCL-Kochi refinery team. A prize money of Rs. 50,000/-.was given away to the winning team. Mr. Madhu S Nair. CMD, Cochin Shipyard gave away the prizes. Mr. Koya Venkata Reddy, Hony. Secretary, Kochi RC proposed vote of thanks.

Mumbai Regional Centre

Date: 4 – 6 October 2018
Event: Poster Presentation Competition

Topic: Role of Chemical Engineers in Make in India, Swachh Bharat, Smart City

At India Chem 2018, which was organised by FICCI, the 2nd edition of BlastCarbo-FICCI Award presentation for Poster Competition was hosted by Mumbai RC in

association with FICCI. As many as 20 teams comprising 45 students from colleges all across Mumbai participated in the competition. Winners and the first as well as the second runner ups received cash prizes. The 1st Prize went to a student from Shivaji Rao Jondhale College of Engineering, Dombivali. Joint winners for the 2nd prize were from Thadomal Shahani Engineering College, Mumbai and joint winners for the 3rd prize were from MGM College of Engineering and Technology, Navi Mumbai as well as Mukesh Patel School of Technology Management & Engineering NMIMS, Mumbai.

STUDENT CHAPTER ACTIVITIES

Anurag Group of Institutions, Hyderabad

26 November 2018: A lecture was delivered by Dr.T. Sunil Kumar, Associate Professor, Department of Chemical Engineering,NIT, Warangal on the topic 'Modeling and Simulation of Heat Exchangers'. The lecture provided technical insights into the modeling equations of heat exchangers which need to be understood and studied in the industry. He also explained their importance in simulation of heat exchangers in chemical process industries. Students were briefed about various simulation software, particularly about COMSOL software, for greater understanding about the dynamics of process principles in chemical industries.

19, 20 December 2018: A national-level technical fest RASAYANIKA 2K18 was organised in association with the Hyderabad Regional Centre. The theme of the fest was 'Emerging Technologies for Service of Humanity: Innovations and Opportunities'.

Delhi Technological University, Delhi

29 October 2018: An essay writing competition was organised for the Chemical Engineering students on the topic 'Innovative Ways to Control Air Pollution'.

Heritage Institute of Technology, Kolkata

Coming Event:

22 January 2019: ChEMSPARK-2019, comprising events, such as, technical talk from industry, technical model presentation (Innovate), IN-QUIZ-ITION, CAD-SCAPE, and SERLOCKED, will be organised for students. Prize money worth Rs. 12,000/- will be distributed among the winner of respective events.

Indira Gandhi Institute of Technology, Sarang

Coming Event:

January 2019: Inter-batch completion on quiz and paper presentation.

Saintgits College of Engineering, Kottayam

11 September 2018: Students Chapter was inaugurated at the Dept. of Chemical Engineering under the aegis of Kochi Regional Centre. It was inaugurated by Dr. R. Venugopal, Deputy Chief Controller of Explosives (PESO). Dr. Sreejiith (HoD, Chemical Engineering Dept.) presided over the function and Mr..P.K.Suresh KumarÊ(Ex-chairman, Kochi RC) delivered the felicitation speech.

National Institute of Technology, Calicut

13 October 2018: A quiz programme was held as part of the annual technical festival 'Concorso'. Approximately 25 participants were present from different collages, i.e., Government Engineering College, Trichur; Government Engineering College, Kozhikode; TKM Engineering College, Kollam;, Amal Jyothi Engineering College, Kanjirapally; and, SNGE college. GEC Trichur bagged the first and the second prize while NIT Calicut Êgot the third prize.

Amal Jyothi Engineering College, Kanjirapally

12 - 16 November 2018: A multi-event programme, ChemWeek, was held. Events included Video show on BP refinery explosion and quiz contest, motivational video show, quiz contest on process safety, Suraksha Radham – training programme on occupational safety and health, etc.

Pandit Deendayal Petroleum University, Gandhinagar

11 October 2018: A lecture was delivered on 'Optimization: Engineering Applications' by Dr. Nitin Padhiyar, Assistant Professor, Indian Institute of Technology, Gandhinagar. Dr. Padiyar emphasized the importance of optimization & research for the developments of engineering applications with specific examples.

26 October 2018: A quizzing extravaganza – CHEMFUGE – was organised. This inter-college event tested the knowledge of Chemical Engineering, general knowledge and agility of the budding chemical engineers from several engineering institutes.

26 October 2018: A lecture was delivered on 'Fertilizer Technology: Chemical Process' by Mr. Alok Jaiswal, Manager -IFFCO Kalol. An interactive session with students followed.

15 November 2018: A lecture was delivered on 'Research and Innovation – Industrial Case Studies' by Dr. R.R. Sonde, Executive Vice President, Research, Technology & Innovation Centre & Member, Board of Executive Council, Thermax Ltd, Pune, India.

MS Ramaiah Institute of Technology, Bangalore

26 October 2018: A talk was delivered by Dr. Archna, HoD. Department of Chemical Engineering, MSRIT to the students of 5th and 7th semesters. She spoke on the importance of competitive examinations and career opportunities.

6 November 2018: A visit was organised to the HPCL R&D centre at Hoskote, Bangalore for 16 selected students of 3rd , 5th and 7th semesters and two research scholars along with a faculty member.

23 November 2018: Students of the 5th Semester along with two faculty members from Department of chemical engineering visited Sami Labs Pvt. Ltd., Nelamangala and Sabic Research And Technology Pvt. Ltd, Sarjapur, Bangalore.

24 November 2018: A seminar on 'Chemical Engineers and New World Technologies' was organized by the Department of Chemical Engineering, Ramaiah Institute of Technology jointly with Poornaprajna Institute of Scientific Research and Bangalore Regional Centre, IIChE. The resource persons were Dr. Sunil S Shah and Mrs. Vijaylakshmi Shah from ModeliCon InfoTech, Mr. M Sukumaran, IndustriConnect Technologies and Dr. R. Vetrivel, Faculty, Poornaprajna Institute of Scientific Research.

5 December 2018: An outreach programme was conducted by Dr.Vidya Sundararajan, Head, Planning and Human Resource Management Division, Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam on 'Carrier Opportunities in Department of Atomic Energy'. She addressed the 5th and 7th semester students of the Chemical Engineering department of the Institute about jobs, internships and fellowship opportunities in DAE units.

RVR & JC College of Engineering, Guntur

Coming Event

5 January 2019: Tech Fest, a national level technical symposium, will be organised in association with Guntur Regional Centre. The event will comprise programmes, such as, paper and poster presentation, quiz contest and model making.

S. N. Patel Institute of Technology & Research Centre, Bardoli

6 October 2018: Dr. Yogeshwar Suryavanshi, Assistant Professor, Technical and Applied Chemistry Department, Veer Mata Jijabai Technological Institute, Mumbai, spoke on the topic 'Yes I Can' for the 2nd and 3rd year students of the chemical engineering department. Objective of the talk was to equip the students by bringing industry knowledge into class rooms and making the participants competitive through interaction with top professionals.

KLE Dr. M. S. Sheshgiri College of Engineering and Technology, Belagavi

5 October 2018: Pick and Speak on Chemical Engineering aspects.

27 October 2018: A visit to the plant of Aditya Birla Chemicals Pvt. Ltd. Karwar was organised for students.

29 October 2018: A seminar was organised on 'Education to Corporate'. Ms. Zeba Dhalayat, alumna of the department and Engineer, Materials & IMDS Compliance, EASi Bengaluru was the resource person.

17 November 2018: A workshop on 'Industrial Safety' was organised. It was conducted by Mr. JeevanJamble, Production Manager, HLL Lifecare, Kanagala.

24 November 2018: A workshop on 'Simulation in Process Engineering Using ChemCAD' was organised. It was conducted by Mr. Lister Harington Falerio, Research Scholar, NIT Surthakal.

27 November 2018: A mock GATE test on subjects covering Momentum Transfer, Process Heat Transfer and Chemical Engineering Thermodynamics was conducted for benefit of the students.

Visvesvaraya National Institute of Technology, Nagpur

27 November 2018: Aworkshop on 'Fire Emergency Safety and the Use of Fire Fighting Equipment' was conducted in association with Nagpur Fire Department. The workshop was attended by Faculty members, students, lab assistants, security members and Hostel Mess workers of VNIT.

Manipal Institute of Technology, Manipal

29, 30 October 2018: A National Symposium, CHEMIGNITE-2K18, was held in association with Mangalore RC on the theme of 'Carbon Capture and Sequestration Technology'. Events included guest lectures and technical paper presentations. Dr.P. K. Karanth Memorial Quiz Competition was also held, in which students took part. Awards as well as certificates were given away to the winners.

National Institute of Technology, Warangal

Coming Event

15, 16 February 2019: INCEEE 2019, 2nd International Conference on New Frontiers in Chemical, Energy and Environmental Engineering, will be held on the occasion of the Diamond Jubilee of NIT, Warangal. Details are available on cms.nitw.ac.in/conference/inceee2019 and www.nitw.ac.in/department/che.

Kongu Engineering College, Perundurai, Erode

Coming Event

25 January 2019: CONCEPT 2019, National Conference on Current & Emerging Process Technologies, will be organised. The meet will focus on topics, such as, Advanced Separation techniques, Catalysis & Reaction Engineering, Biochemical Engineering, Process Plant Safety, Renewable Energy, Green Chemistry, Nanotechnology, Polymer & Composites, Waste water treatment, etc. For details, send your query to concept2k19@gmail.com.

Elements and Guidelines of Process Safety & Risk Management- II
Visible Felt Leadership and Operating Discipline

Joy M. Shah[1]

"*If you put good people in bad systems, you get bad results. You have to water flower, you want to grow*" – **Stephen Covey**

We have heard about safety culture with medium and large-scale companies. Still they face major loss accidents. Had we thought of why is it happening even though they have good safety culture? Is good safety culture enough? Or should we target great safety culture? If so, what is the difference in good safety culture and great safety culture? This is what is given in title of this article.

Visible felt leadership is the word coined by DuPont but it has been explained and elaborated by many other companies in their own way. It is the visible management commitment summarised in first four best practices of this author's short note (Part 1). Felt leadership starts from top and sends a clear message by their action that leadership is not only about driving revenue and contributing to shareholder value but about preservation and protection of an organisation's most valuable resource – employees.

It is not only to do but it is to be seen and to be believed. Theodore Roosevelt once said, "Nobody cares how much you know, until they know how much you care."

Visible Felt leadership is the management's total actions that lead people at all levels to understand and "feel" their leaders' high standards and accept their strong commitment to safety as being genuine, caring and respectful.

Visible felt leadership can be practised in all safety events, meetings, discussions as well as decision making. Following are the main areas which will be noticed by everyone.

1. Work place observations and coaching.
2. Participation in every meeting and discussion related to safety.
3. High potential and serious incident investigations
4. Review of reports to ensure that appropriate action has been taken and communication has been conveyed to prevent recurrence
5. Setting goals and objectives to establish expectations for line management.
6. Town hall meetings

Providing coaching and feedback are the two aspects of visible felt leadership.

Following are the key principles or best practices of Felt Leadership.

1. Visibility of leaders' action on safety within the organisation.
2. Relentlessness of leadership about spending time with employees and contractors as well as coaching them.
3. Recognition of not only the leadership for its role as teacher/trainer/coach but recognition of all employees for their role as teacher/ trainer/coach in town hall events.
4. Development of own safety functioning skills and passing them along to the organisation.

[1] The author is Founder and Chief Consultant, Innov8 ProTech Solutions, Sustainability and Management Consultant. Formerly, he was Sr. Vice President – Technical at Reliance Industries Ltd. He is also a member of the Chemical Process Safety Committee 2018, IIChE

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5. Behaving and leading all the time as others would be expected to do.
6. Maintenance of a self-safety focus and continuous emphasis and clarity around safety expectations.
7. Confirmation and reconfirmation of 'safe' production as the number one value not only in policy but in action and in decision making.
8. A visible passion for continuous improvement, ZERO injuries, illness and incidents.
9. Celebration and recognition of Goal Zero success.

It is essential that Leaders 'walk the talk' and change their own behaviour, influence other people's behaviour so that other people also change their behaviour. For great safety culture, mind sets and behaviour must be addressed at every level from leadership to shop floor as every level will look 'up' to see which behaviours are being role modelled by their leaders. Unless behaviour becomes habits, great safety culture cannot be achieved.

Sum of individual behaviours will become individual performance and sum of individual performances will become organisational performance. Visible felt leadership will lead to Operational discipline and make individual behaviour for safety a habit.

There are 11 characteristics of operational discipline divided into three categories:

1. Leadership / cultural

1.1. Leadership by example
1.2. Commonly shared values
1.3. Strong team work
1.4. Pride in organisation

2. Processes

2.1. Sufficient and capable resources
2.2. Employee involvement
2.3. Active line of communication
2.4. Up-to-date documentation

3. Standards

3.1. Excellent housekeeping
3.2. Practice consistent with procedures
3.3. Absence of shortcuts

There are three major characteristics of Operational Discipline.

1. **Innovation, agility** and **continuous improvement,** which are evidenced by learning mindset, adopting best practices, improving upon goals and plans, by internalising and by self assessment.
2. **Just and Fair,** which is evidenced by establishing cardinal rules, just and fair management, review of all violations, recognition of superior performance and encouraging reporting without fear.
3. **Risk sensitivity,** which is evidenced by evaluation of all oprerational risks, risk evaluation as a part of budget and personal planning, periodic review of risk to bring it down to tolerable level.

For goal zero, it is required that safety culture transforms from Reactive culture to Proactive culture. Employees have to transform from compliance to commitment.

There are four phases of this transformation.

1. **Natural instinct** - People don't take responsibility and believe accidents will happen.
2. **Dependent Stage** - People view safety as following rules. Accident rates decrease.
3. **Independent Stage** - People take responsibility and believe they can make a difference with actions. Accidents reduce further.
4. **Interdependent Stage** - Teams feel ownership and responsibility for safety culture. They believe zero injuries is an attainable goal.

DuPont's Bradley's curve is shown below for understanding and driving to Great safety culture.

Outcome of Visible Felt Leadership and Operating discipline will be Great interdependent Safety Culture and Operation Excellence.

Patent Scenario in India[1]

INTRODUCTION: Various offices under the administrative control of Controller General of Patents, Designs and Trademarks (CGPDTM) have been showing consistent growth of IP activities over the years in general. However, during 2016 – 17, the total number of applications filed for Patents, Designs and Trademarks revealed slight decrease as compared to 2015-16. On the other hand, applications filed for GI and Copyright showed increasing trend. Overall filing of applications (3,55,393) showed a slight decrease of 0.37% in 2016 – 17 as compared to the previous year (3,56,713). Trends in the last five years in respect of filing of patent applications are shown below.

Table 1: Patent Application

Year	No. of Applications Filed
2012-13	43,674
2013-14	42,951
2014-15	42,763
2015-16	46,904
2016-17	45,444

Trends in patent filling : During 2016 – 17, 45,444 patent applications were filed, exhibiting a slight dip of 3.2% in the filing as compared to the previous year. Disposal of applications included patents granted/ refused by the Patent Office and also applications withdrawn and abandoned by the applicants.

Table 2: Trends in Patent Applications

Year	Filed	Examined	Granted	Disposal
2012-13	43,674	12,268	4,126	9,027
2013-14	42,951	18,615	4,227	11,411
2014-15	42,763	22,631	5,978	14,316
2015-16	46,904	16,851	6,326	21,987
2016-17	45,444	28,967	9,847	30,271

During 2016-17, the number of patent applications examined increased by 72.2%, number of grant of patents increased by 55.3% and disposal of applications increased by 37.7% as compared to 2015-16. Domestic filing of patents applications was 29.2% in 2016-17 as compared to 28% in the previous year, thereby showing 1.2% increase as compared to 2015-16.

During 2016-17, several initiatives were taken to further upgrade the existing IT-enabled environment, computerised work-flow and internal IT system in Intellectual Property Offices. Upgrade of online services and improved dissemination of IP information, has significantly contributed to overall strengthening of the digital system. The office undertook necessary initiatives for better and smoother functioning of its international division. Initiatives were taken to provide

[1]This article has been compiled from Intellectual Property India Annual Report 2016 – 17.

quality international search and preliminary examination reports (ISRs and IPERs) in strict adherence of time in respect of International Patent Applications filed under International Searching Authority (ISA) and International Preliminary Examination Authority (IPEA) under the Patent Cooperation Treaty (PCT) at Indian Patent Office.

The functioning of Trade Marks Registry Mumbai as the office of origin under Madrid Protocol, an international system for registration of trademarks administered by WIPO, was further streamlined so as to provide statutory protection for a trademark in various countries by filing a single application in the country of origin.

Steps taken in recent years for streamlining public service delivery, improving efficiency and transparency in the functioning of Intellectual Property Offices, particularly, with respect to patients, are explained below:

i. ***Legislative Improvement***:

Patent Rules 2003 have been amended with effect from 16th May, 2016 to simplify patent procedures and complete IT enablement in functioning. The following improvements have been brought about in the functioning of the Patent Office by Patents (Amendment) Rules, 2016:

• Streamlining timelines for disposal of patent applications,

• Creation of Startup as a new category of applicant and facilitating Startup applications with 80% Fee concession,

• Expedited examination of patent applications filed by startups and the applicants selecting Indian Patent Office as ISA/IPEA for their PCT applications,

• Withdrawal of application before the issuance of the First Examination Report, if applicant is not interested in pursuing examination of his application filed for patent and refund of fees paid for Request for Examination allowed.

• Hearing through video-conferencing or audio-visual communication devices is allowed on request made by applicant at all Patent Office locations.

• Adjournments of hearing in opposition proceedings have been restricted to a maximum of two by each party, which will help to dispose of the matters in time. It is also provided that no adjournment will be more than 30 days.

• Mandatory online filing by patent agents in order to speed up digitisation and processing of patent applications.

• PCT applicant can now delete some claims while entering the national phase entry.

• Fees for sequence listings has been reduced with the maximum fee fixed at Rs. 1,20,000.

ii. Procedural improvements:

• Auto-allocation of requests for examination of patent applications: In continuation to the important initiative, 'Unique Numbering System for Patent Applications and Requests for Examination', started from 1 January 2016, the Patent Office has introduced electronic module-based system of 'Auto- allocation of Requests for examination' from 1 April 2016 . This system has brought in a single group-wise queue of Requests of Examination to have uniform examination at all Patent Office locations with respect to date of filing of requests of examination. The system has removed anomaly of different time of examination at different locations. Besides, after integration of Electronic Modules with the new numbering system and auto allocation of applications, need for examiners' physical presence at a particular patent office has also been eliminated.

• E-Communication: First Examination Reports are sent through e-mail since 1 April 2016. Thus, paper mode of communication for examination reports has been discontinued and e-communication with the stakeholders has been initiated. Hearing notices are also sent through e-mail. This helps in speeding up the procedures.

• Automation of patent grant certificates: The process relating to generation and issuance of Patent grant certificates has been fully automated. Certificates are generated and transmitted to the applicant on the registered email and made available on the official website. The same can be downloaded and printed as desired by the applicant.

• Patent Search System: A login-free online public search facilities for patents, 'Indian Patent Advanced Search System (InPASS)', having full text search capability, which was already in practice, has been updated during receny years to further streamline the search system.

• Electronic payment gateway for PCT application fees has been introduced from 1 April 2016 to avoid delay in transmission of fees for PCT applications to International Bureau and International Searching Authority.

• Dynamic utilities: Many dynamic utilities on patent are available in the IPO website for the benefit of public like displaying the status on disposal of patent applications by the respective examination groups during a specified period, viewing 'First Examination Report (FER)' issued (Jurisdiction and Group-wise) at all locations of Patent Office..

• Quality Control system has been put in place to ensure that the quality reports are forwarded to the IP-user public. During 2016-17, the number of patent applications examined increasedÊ by 72.2%, number of grant of patents increased by 55.3% and final disposal of applications increased by 37.7%, as compared to Ê 2015-16. Domestic filing of patents applications was 29.2%, which was higher by 1.3% as compared to 2015-16.

During 2016 – 17, filing of patent applications in majority of fields of invention showed modest to high growth except in the fields of Chemicals, Pharmaceuticals, Food, Bio-technology, Bio-chemistry, Micro-biology, Agro-chemical, Textile, Polymer and Metallurgy, which witnessed a decrease in filing as compared to 2015 - 16.

Table 3: Top 5 Indian applicants for patents

Name of applicants	No. of Applications filed
Indian Institute Of Technology (Collective)	400
Wipro Limited	226
Council Of Scientific And Industrial Research	225
Mahindra & Mahindra Limited	205
Bharat Heavy Electricals Ltd.	174

Table 4: Top 10 Indian Applicants for patents from Scientific and Research & Development Organizations

Name of Organization	No. of Applications filed
Council of Scientific And Industrial Research	230
Director General, Defence Research & Development Organisation	58
G.H.R. Labs And Research Centre	50
Indian Council of Agricultural Research (Icar)	41
Hetero Research Foundation	23
Allinov Research & Development Private Limited	20
Msn Research & Development Center	19
L&T Technology Services Limited	18
Sun Pharma Advanced Research Company Limited	14
Indian Space Research Organisation	13

Table 5: Top 10 Indian Applicants for patents from Institutes and Universities

Name of Institutes/Universities	No. of Applications filed
Indian Institute Of Technology (Collective)	400
Amity University	106
Indian Institute Of Science	54
Veltech High/Multi Tech Dr. Rr & Dr.Sr (College And University	50
G.H. Raisoni College Of Engineering	49
Bharath University	45
Chandigarh Group Of Colleges	30
Chitkara University	29
Hindustan Institute Of Tecknology & Science	28
National Institute Of Technology (Collective)	26

CHEMITRENDS

World's Fastest Supercomputer Unveiled

Scientists at the University of Manchester in the United Kingdom have activated the world's biggest 'brain', which is a supercomputer with a million processing cores and 1,200 interconnected circuit boards that together operate like a human brain. Named, Spiking Neural Network Architecture or SpiNNaker, which took 10 years to complete, it not only "rethinks the way conventional computers work" but it also creates models of the neurons in human brains and simulates more neurons in real time than any other computer on Earth, according to project member Steve Furber, a professor of Computer Engineering at the University of Manchester.

Since April 2016, SpiNNaker has been simulating neuron activity using 500,000 core processors. But the upgraded machine has twice that capacity. Presently, it has the capacity to perform 200 quadrillion actions simultaneously. While some other computers may rival SpiNNaker in the number of processors they contain, what sets this platform apart is the infrastructure connecting those processors.

In the human brain, 100 billion neurons simultaneously fire and transmit signals to thousands of destinations. SpiNNaker's architecture supports an exceptional level of communication among its processors, behaving much like a brain's neural network does. With the support of the European Union's Human Brain Project, scientists are continuing their effort to construct a virtual human brain. However, even with a million processors, it is possible to only approach just 1 percent of the scale of the human brain, and that's with a lot of simplifying assumptions, according to Furber. SpiNNaker could mimic the function of a mouse brain, which is 1,000 times smaller than a human brain, he clarified.

Scientific American, 5 November 2018, www.scientificamerican.com

Purple Bacteria Turn Sewage into Clean Energy

Organic compounds in household sewage and industrial wastewater are a rich potential source of energy, bioplastics and even proteins for animal feed. However, due to lack of efficient extraction method, treatment plants discard them as contaminants. Now researchers at King Juan Carlos University, Spain have discovered an environment-friendly and cost-effective solution.

Published in *Frontiers in Energy Research*, their study is the first to show that purple phototrophic bacteria, which can store energy from light when supplied with an electric current, can recover almost 100% of carbon from any type of organic waste while generating hydrogen gas for electricity production. "One of the most important problems of current wastewater treatment plants is high carbon emissions," according to Dr Daniel Puyol, one of the team members. This light-based biorefinery process could provide a means to harvest green energy from wastewater with zero carbon footprint.

For photosynthesis, green is the most important colour. However, as chlorophyll retreats from autumn foliage, the colour of leaves turns yellow, orange and red. In fact, photosynthetic pigments come in all sorts of colours and all sorts of organisms. The purple phototrophic bacteria capture energy from sunlight using a variety of pigments, which turn these leaves into shades of orange, red or brown as well as purple. These purple phototrophic bacteria make an ideal tool for resource recovery from organic waste due to their highly diverse metabolism. The bacteria can use organic molecules and nitrogen gas instead of CO_2 and H_2O to provide carbon, electrons and nitrogen for photosynthesis. As a result, they grow faster than alternative phototrophic bacteria and algae,and can generate hydrogen gas, proteins or a type of biodegradable polyester as by-products of metabolism.

The group analyzed the optimum conditions for maximizing hydrogen production by a mixture of purple phototrophic bacteria species. Capturing excess CO_2 produced by purple bacteria could be useful not only for reducing carbon emissions, but also for refining biogas from organic waste for use as fuel.

Science Daily, 13 November 2018

GM Indoor Plant to Cleanse Home Air

Researchers at University of Washington have genetically modified a common indoor plant - Pothos Ivy - to remove pollutants from inside the house, including chloroform and benzene, that have been linked to cancer. The modified plants generate a protein, called P450 2E1 or 2E1, that transforms these compounds into molecules that the plants can then use to support their own growth, according to Prof. Stuart Strand, one of the members of the research team. For the study, the team tested how well their modified plants could remove the pollutants from air compared to

normal Pothos Ivy. They put both types of plants in glass tubes and then added either benzene or chloroform gas into each tube. Over 11 days, they tracked how the concentration of each pollutant changed in each tube. Findings, published in Environmental Science and Technology, showed that for the unmodified plants, the concentration of either gas did not change over time. However, for the modified plants, the concentration of chloroform dropped by 82 per cent after three days, and it was almost undetectable by day six. In addition, the concentration of benzene also decreased in the modified plant vials by about 75 per cent.

"If you had a plant growing in the corner of a room, it will have some effect in that room. But without air flow, it will take a long time for a molecule on the other end of the house to reach the plant," Strand noted. The team is currently working to increase capabilities of transgenic plants by adding a protein that can break down another hazardous molecule found in air in houses, including the most toxic formaldehyde, which is present in some wood products, such as laminate flooring and cabinets and tobacco smoke. Researchers estimate that a hypothetical bio-filter made of these transgenic plants could deliver cleaner air as compared to commercial home particulate filters. However, more work is needed to establish its practical applications.

Environmental Science and Technology, Web Publication: December 19, 2018

Cell-sized Robots for Multi-tasking

Researchers at MIT, led by Professor Michael Strano, have developed tiny robots not bigger than a cell by using a new method, called 'autoperforation'. The microscopic devices, which the team calls 'syncells' (short for synthetic cells), might eventually be used to monitor conditions inside an oil or gas pipeline or to search out disease while floating through the bloodstream. The key to making such tiny devices in large quantities lies in a method that the team has developed for controlling the natural fracturing process of atomically-thin, brittle materials. It directs the fracture lines so that they produce miniscule pockets of a predictable size and shape. Embedded inside these pockets are electronic circuits and materials that can collect, record and output data.

The system uses a two-dimensional form of carbon called graphene, which forms the outer structure of the tiny syncells. One layer of the material is laid down on a surface, then tiny dots of a polymer material, containing the electronics for the devices, are deposited by a sophisticated laboratory version of an inkjet printer. Then, a second layer of graphene is laid on top. Ranging in size from that of a human red blood cell, about 10 micrometers across, up to about 10 times that size, these tiny objects "start to look and behave like a living biological cell". There are a wide range of potential new applications for such cell-sized robotic devices, says Strano. it opens up a whole new toolkit for micro- and nanofabrication," Prof. Strano says.

PHYS.ORG, https://phys.org/news/2018-10-mass-cell-sized-robots.html, 23 October 2018

Device Made that Stores Solar Power in Water

The renewable solar energy school under NB Institute for Rural Technology, Kolkata, headed by solar power expert, S.P. Gon Chaudhury, has developed a prototype of an integrated machine that will store solar power in water for 24 hours. The integrated machine has five parts – a solar panel, a micro-solar pump, a micro-hydel equipment, a water tank and a water reservoir. Once the solar panel produces solar power, it is first tored in the underground reservoir and then pumped into the overhead water tank, where it is stored as potential energy. To generate power, a micro-hydel equipment has to be switched on, which will bring high-pressured stored solar-powered water into the main machine, which will turn it into electricity.

According to Gon Chaudhuri, while at present, only a small amount of solar power can be stored in batteries, with this machine, solar power could be stored for 24 hours at a cost of about one-fifth of the batteries, presently available. Moreover, through this machine, solar power could be stored in water for over 40 years. Batteries storing solar power now have an average life of around five-six years. The Ministry of Science and Technology has allocated Rs. 2.7 crore to initiate a pilot project to develop this integrated machine for mass solar-hydel project in Assam.

The Times of India, Kolkata; 9 November 2018

SAFETY, HEALTH AND ENVIRONMENT

Ozone Layer is Recovering: UN Report

The ozone layer that shields life from cancer-causing solar rays is recovering at a rate of 1 to 3 per cent per decade, thereby reversing years of dangerous depletion caused by the release of harmful chemicals, according to a UN study, titled, *Scientific Assessment of Ozone Depletion: 2018*. The four-yearly review of the Montreal Protocol, a 1987 ban on man-made gases damaging fragile high-altitude ozone layer, etc., found long-term decrease in the atmospheric abundance of controlled ozone-depleting substances and the ongoing recovery of stratospheric ozone.

The UN has already hailed the success of the Montreal Protocol, which banned or phased out ozone depleting chemicals, including chlorofluorocarbons that was once used in refrigerators and spray cans. However, it was the first time that there were emerging indications that the Antarctic ozone hole had diminished in size and depth since 2000, the report said. Nonetheless, while most of the banned gases have been phased out, the report found an unexpected rise in production and emissions of CFC-11 from eastern Asia since 2012.

UN News, 5 November 2018; *The Hindu*, 6 November 2018

Microplastics Found in Human Guts

Microplastics have been found in human excreta for the first time, according to a study, conducted by The Environment Agency Austria, suggesting that the tiny particles may be widespread in the human food chain. The small study was led by Schwabl, a researcher at the Medical University of Vienna. It examined eight participants from Europe, Japan and Russia. All of their stool samples were found to contain microplastic particles. Up to nine different plastics were found out of 10 varieties tested for, in particles of sizes ranging from 50 to 500 micrometres. Polypropylene and polyethylene terephthalate were the plastics most commonly found. On average, 20 particles of microplastic were found in each 10g of excreta.

Microplastics are defined as particles of less than 5mm, with some created for use in products, such as, cosmetics, but also by the breaking down of larger pieces of plastic, often in the sea. Based on this study, the authors estimated that "more than 50% of the world population might have microplastics in their stools", though they stressed the need for larger-scale studies to confirm this. The Environment Agency conducted the tests using a new procedure, shedding fresh light on the extent of microplastics in the food chain. Samples from the eight subjects were sent to a laboratory in Vienna where they were analysed using a Fourier-transform infrared microspectrometer. Philipp Schwabl said, "This is the first study of its kind and confirms that plastics ultimately reach the human gut.

The smallest microplastic particles are capable of entering the bloodstream, the lymphatic system, and may even reach the liver, according to Schwabl. Pressure for action is growing. The European parliament has already voted for an EU-wide ban on microplastics in cosmetics.Ê

The Guardian International Edition, 22 October 2018, https://www.theguardian.com/environment/2018/oct/22/microplastics-found-in-human-stools-for-the-first-time

India-made Cannabi-based Cancer Drugs Soon

New hemp-based medicines for cancer pain management and epilepsy treatment that will be manufactured in India are set to be available in next one year with the Council for Scientific and Industrial Research (CSIR) in advanced stage of clinical trials to launch two breakthrough drugs.

The move to produce medicine formulations that incorporate hemp lend a fresh reputation to the otherwise controversial cannabis, which can also be used as a drug of abuse and has potentially harmful psyche-altering qualities.

The two new drugs are expected to be superior compared to the existing line of treatment. For instance, morphine is currently used for pain management in cancer patients and while it can be habit-forming, cannabis-based drugs will not be. They can also help address nausea and enhance appetite in patients undergoing chemotherapy. For trials related to cancer pain management, CSIR's Indian institute of Integrative Medicine (IIIM) has tied up with Tata Memorial Hospital, whereas tests for the epilepsy drug will be conducted in New Delhi's AIIMS. Ratan Tata-backed cannabis research start-up, Bombay Hemp Company (Boheco), is CSIR's funding partner for the two research projects and is expected to market the drugs in India.

Cannabis-based drugs for cancer pain management and epilepsy have been approved in the US and Europe. However, Indian patients can only import them based on special permission from doctors. Since these medicines

are exorbitantly priced, very few patients can afford them. Once the drugs are manufactured in India, the prices are expected to decline significantly.

The Times of India, 24 November 2018

Study Finds Organic food More Harmful

A new international study, conducted by Chalmers University of Technology, Sweden, has revealed that organically farmed food has a bigger climatic impact than conventionally farmed food. This is the finding of a new international study involving Chalmers University of Technology, Sweden. The reason why organic food is so much worse for the climate is that the yields per hectare are much lower, primarily because fertilisers are not used. To produce the same amount of organic food, one therefore need a much bigger area of land. The ground-breaking aspect of the new study is the conclusion that this difference in land usage results in organic food causing a much larger climatic impact.

The researchers developed a new method for assessing the climatic impact from land-use by using this along with other methods to compare organic and conventional food production. The results showed that organic food can result in much greater emissions. For instance, organic peas, farmed in Sweden, have around a 50 percent bigger climate impact than conventionally farmed peas. For some foodstuffs, there is an even bigger difference. "The greater land-use in organic farming leads indirectly to higher carbon dioxide emissions, thanks to deforestation," explained Stefan Wirsenius, one of the team members conducting the study.

Even organic meat and dairy products – from a climate point of view – are worse than their conventionally produced equivalents, claimed Stefan Wirsenius. The researchers used a new metric, which they call 'Carbon Opportunity Cost,' to evaluate the effect of greater land-use contributing to higher carbon dioxide emissions from deforestation. This metric takes into account the amount of carbon that is stored in forests and thus released as carbon dioxide as an effect of deforestation. The study is among the firsts in the world to make use of this metric. Even biofuels are harmful to the climate because they require large areas of land suitable for crop cultivation, thus, according to the same logic, they lead to increase in deforestation globally.

Science Daily, 13 December 2018

Plastic Waste to Make Roads Better?

Plastic waste, considered to be one of the worst forms of environmental pollutants, may turn out to be one of the key ingredients for road maintenance. The Housing Infrastructure Development Corporation (Hidco) has given its consent to the use of plastic waste for laying a one-km bituminous road stretch in New Town area of Kolkata. This would make the road surface tougher and enhance its life span. Shredded plastic waste can blend with bitumen at very high temperature. Although the technology has already been used elsewhere, its commercial viability is yet to be proven. IIT Kharagpur and Hidco have separately carried out laboratory experiments on proper blending of plastic waste with bitumen.

According to a road construction expert, first, a certain amount of crushed plastic waste has to be melted in high temperature. Then the blended melted plastic is to be mixed with the bitumen aggregator. This bituminous layer, blended with melted plastic waste, will be used in the top layer of roads. Use of plastic waste can be advantageous in two ways. As plastic is water-resistant, by mixing plastic with bitumen, one can minimise the damage of roads from heavy rains. It can also prevent pollution of environment from plastic wastes as the latter will be recycled and mixed with bitumen.

The Times of India, 12 November 2018

INDUSTRY NEWS

GEECL to Pump in US $ 2 bn for Bengal Shale Gas Search

West Bengal-based coal-bed methane extraction firm, Great Eastern Energy Corporation Ltd. (GEECL), has announced plans to invest US $ 2 billion (Rs. 200 crore) to explore and extract shale gas from the state's existing reserve. The government has recently permitted exploration and exploitation of all types of hydrocarbons, including shale resources under existing coal bed methane contracts.ÊAn independent engineering firm, Advance Resource International, has estimated the reserve of shale gas to be around 9.25 trillion cubic feet. Its undiscounted value has been estimated at $13.78 billion (Rs. 3,200 crore).

At present methane is being produced from the Raniganj (South) block in West Bengal, which covers 210 square kilometres with 9.25 trillion cubic feet of original gas-in-place. The company's second license is for Mannargudi block in Tamil Nadu, spread over 667 square kilometres with 0.98 trillion cubic feet of original gas-in-place. Prashant Modi, Managing Director & CEO of Great Eastern Energy Corporation, is optimistic that the shale gas resources can be explored and developed cost-effectively in tandem with the company's successful ongoing coal bed methane development programme through sharing of surface and other infrastructure facilities. The company is currently planning initial exploration programme for exploiting shale in their block.

The Economic Times, 15 November 2018

Lupin Partnership with AbbVie for Cancer Drug

One of India's major pharmaceutical companies, Lupin Ltd., has announced a partnership with global pharma giant AbbVie for development and commercialisation of Lupin's novel oncology drug for ewrrrtreatment of haematological cancers. AbbVie has entered into a licensing agreement with Lupin for its MALTI inhibitor programme. AbbVie will further develop and launch the drug in the market.

Through this partnership, AbbVie has gained exclusive global rights to develop and commercialise MALTI inhibitors. AbbVie will give Lupin an upfront payment of US$ 30 million for an exclusive licence to the programme. Lupin's Novel Drug Discovery and Development (NDDD) team is focussed on building a pipeline of highly differentiated and innovative new chemical entities in the therapeutic areas of oncology, immunology and metabolic disorders.

The Hindu, 25 December 2018

RIL to Raise Refining Capacity to Over 100 mtpa

Reliance Industries Ltd. (RIL) plans to increase its refinery capacity by 50% to over 100 mt annually. The proposed expansion involves a brownfield project for two of its existing refineries at Jamnagar and a new Greenfield project at a cost of US $ 10 billion or over Rs. 70,000 crore. Reliance built its first refinery at Jamnagar with an installed capacity of 6,60,000 barrels per day or 33 mtpa in 1999. In 2008, the company commissioned an export-oriented unit with capacity to process 540,000 barrels per day or 27 mpta, in addition to its existing refinery. RIL has already expanded its refinery capacity at Jamnagar to 70 mtpa in 2017.

Meanwhile, global oil majors, such as, Saudi Aramco, Abu Dhabi National Oil Corporation and oil traders, such as, Vitol Group, Trafigura Group and Glencore, have indicated their interest in partnering India for setting up strategic crude oil reserves in the country. The government plans to call for bids for partnership in buiding strategic crude storages at Chandikhol in Odisha and Padur in Karnataka on a public-private mode. It will seek US $ 1.5 billion in investments from global oil producers and build two reserves

The Hindu, 16 December 2018; *The Telegraph*, 22 October 2018

3 Cement Majors Plan Expansion, New Units

Top three cement manufacturers in the country, namely, JSW Cement, Star Cement and Dalmia Cement Bharat, will invest over Rs. 3,000 crore in West Bengal in the next few years. While JSW Cement and Dalmia Cement Bharat are expanding their capacity in the existing locations, Star Cement will set up a Greenfield unit in north Bengal Besides expanding its existing plant near Salboni, Dalmia Cement is also considering setting up a unit in north Bengal. JSW Cement, on the other hand, is expanding the capacity of its plant to 4.8 million tonnes per annum from the current level of 2.4 million tonnes in the next two years, requiring an investment of Rs. 1,5000 crore. Star Cement will set up a 2 million tonnes cement plant at Jalpaiguri in north Bengal at an investment of Rs. 400 crore. The cement capacity in the state at present is now at 22 million tonnes with the demand growing at 18% annually.

The Times of India, 1 December 2018

IIChE Awards 2018

The following is a list of IIChE Awards and their recipients. These awards were presented during SCHEMCON 2018 and CHEMCON 2018

Sl. No.	Name of the Awards/Prizes	Awardees of the Year
1.	Dr.B.P.Godrej Life Time Achivement Award	Dr Arun N Dravid, former President, IIChE
2.	Dr H L Roy Memorial Lecture sponsored by Jacobs	Professor V A Juvekar, IIT Bombay, Mumbai
3.	Aker Powergas's Prof N R Kamath and Mrs Ruzena Kamath Memorial Lecture	Mr P D Samudra, Director, Thyssenkrupp Industrial Solution (India) Pvt Ltd., Mumbai
4.	Inventaa C K Murthy Memorial Lecture	Dr U Kamachi Kudali, Chairman, Heavy Water Board, Dept of Atomic Energy, Mumbai
5.	Solenis Bharat Ratna Prof C N R Rao Medal and Chemcon Distinguished Speaker Award	Dr Rakesh Agrawal, Professor, Purdue University, West Lafayette
6.	RPG Life Sciences Padma Vibhushan Prof M M Sharma Medal and Chemcon Distinguished Speaker Award	Professor Santanu Bhattacharya, Director, Indian Association for the Cultivation of Science, Kolkata
7.	Asian Paints Padma Vibhushan Dr R A Mashelkar	Dr Sanjeev S Katti, Director General, ONGC Energy Centre, Medal and Chemcon Distinguished Speaker Award Delhi
8.	Deepak Group's Padma Bhushan Prof L K Doraiswamy Chemcon Distinguished Speaker Award	Dr Anjan Ray, Director, CSIR, Indian Institute of Petroleum, Dehradun
9.	Chemical Weekly's Padmashri Dr G P Kane Chemcon Distinguished Speaker Award	Professor Gargi Das, Indian Institute of Technology, Kharagpur
10.	Hetero Drugs Prof G S Laddha Chemcon Distinguished Speaker Award	Dr Vishnu Pareek, Professor, Curtin University, Australia
11.	CSIR-IICT-Avon Padmashri Dr G S Sidhu Chemcon Distinguished Speaker Award	Dr Rajender Gupta, Professor, University of Alberta, Edmonton
12.	Sartorius India's Chemcon Distinguished Speaker Award	Professor Sunil Nath, Indian Institute of Technology, Delhi
13.	UPL Smt Sandra R Shroff Chemcon Distinguished Speaker Award	Professor G D Yadav, Vice Chancellor, Institute of Chemical Technology, Mumbai
14.	Hikal's Chemcon Distinguished Speaker Award	Professor S Pushpavanam, Indian Institute of Technology Madras, Chennai
15.	CSIR-CSMCRI Chemcon Distinguished Speaker Award	Professor I M Mishra, Indian Institute of Technology Dhanbad, Jharkhand
16.	CSIR-CLRI Padmabhushan Dr Y Nayudamma Chemcon Distinguished Speaker Award	Professor Ajay K Dalai, University of Saskatchewas, Canada
17.	DOST Professor S K Sharma Medal and Chemcon Distinguished Speaker Award	Professor Moses Oludayo Tade, Chairman, Institution of Chemical Engineers, Curtin University, Australia
18.	CSIR-NEERI Chemcon Distinguished Speaker Award	Dr Prabir Basu, Professor, Dalhousie University, Canada
19.	Alkyl Amins Padma Bhushan Prof B D Tilak Chemcon Distinguished Speaker Awardi	Dr Sarwan S Sandhu, Professor, University of Dayton, Dayton, OH
20.	Lala Shriram National Award for Leadership in Chemical Industry	Dr Abanish Panda, Sambalpur, Odisha
21.	Herdillia Award for Excellence in Basic Research in Chemical Engineering	Prof Mihir Kumar Purkait IIT, Guwahati
22.	Jubilant Award for Excellence in Design or Development of Process Plant and Equipment	Dr Debapriya Mandal BARC, Mumbai
23.	NOCIL Award for Excellence in Design or Development of Process Plant and Equipment	Dr Sundergopal Sridhar IICT Hyderabad
24.	Hindustan Lever Biennial Award for the most Outstanding Chemical Engineer of the Year (Under the Age of 45 Years)	Dr Virendra Kisan Rathod ICT, Mumbai
25.	ICI India Ltd Award for Excellence in Process or Product Development	Dr Sanjay Bhardwaj International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad
26.	Amar Dye-Chem Award For Excellence in Research and Development in Chemical Engineering below the age of 35 years	Mohammad (Dr) Ali Haider, IIIT, Delhi

Sl. No.	Name of the Awards/Prizes	Awardees of the Year
27.	P K Nair Biennial Memorial Award for Excellence in Design or Development of Process Plant and Equipment	Dr Madhu Agarwal Malaviya National Institute of Technology, Jaipur
28.	Prof Shyamal Kanti Sanyal Memorial Award for the best PhD Thesis in the Area of Membranes Research with Significant Commercial Potential	Dr Vinoth Kumar R., French National Institute for Agricultural Research, France
29.	Dr A V Rama Rao Fndn Best Ph D Thesis and Research in Chemical Engineering/Technology	Dr Preeti B Subhedar Godavari Biorefineries Ltd, Navi Mumbai Maharashtra And Dr Parag R Gogate ICT, Mumbai
30.	Shah-Schulman Award For the best Ph.D. thesis in the area of Colloid and Interface Sciences for the year 2017	Dr S Manigandan IIT-Madras, Chennai
31.	Shah-Schulman Award For the best Ph.D. thesis in the area of Colloid and Interface Sciences for the year 2018	Kumari Priti Sinha IIT-Bombay, Mumbai
32.	The Chemical Weekly Prize for Best Research Paper published in a High Impact Factor International Journal by an Undergraduate Chemical Engineering Student (First and Second Prizes)	1st Prize Mr Arijit Chakraborty Birla Institute of Technology and Science, Pilani Zuarinagar, Goa 2nd Prize Mr Omkar Yogesh Dapurkar ICT, Mumbai
33.	Chemical Weekly Award for the Best Paper Published in the Institute's Journal (ICE-2017)	Dr M Chidambaram and Dr Chandra Shekar Besta, IIT Madras, Chennai
34.	IIChE NRC Award Best Paper in "Indian Chemical Engineer" 2017	Dr M Chidambaram andDr Chandra Shekar Besta, IIT Madras, Chennai
35.	The Kuloor Memorial Award to the best technical paper published in the journal of the Institute in the issues of the preceding year	Dr M Chidambaram andDr Chandra Shekar Besta, IIT Madras, Chennai
36.	IIChE NRC Award 2nd Best Paper in "Indian Chemical Engineer" 2017	Dr Chandrakant Thakur, NIT, Raipur, Dr Vimal Chandra Srivastava, IIT, Roorkee, Dr Indra Deo Mall, UPES, Dehradun and Dr Ajay Devidas Hiwarkar, BIET, Jhansi
37.	Sisir Kumar Mitra Memorial Award to the second best technical paper published in the journal of the Institute in the issues of the preceding year	Dr Chandrakant Thakur, NIT, Raipur, Dr Vimal Chandra Srivastava, IIT, Roorkee, Dr Indra Deo Mall, UPES, Dehradun and Dr Ajay Devidas Hiwarkar, BIET, Jhansi
38.	IIChE NRC Award 3rd Best Paper in "Indian Chemical Engineer" 2017	Dr Subhoshmita Mondal, Dr Siddhartha Datta and Dr Alakananda Mukhopadhyay, J.U., Kolkata and Dr Pinaki Bhattacharya, HIT, Kolkata
39.	Mrs.Chinnamaul Mem. Prize for Best Tech Paper presented in preceding year CHEMCON	Ms Samyuktha G, Mr N Rama Rao, Mr K V Mirji and Mrs Sheela, NFC, Hyderabad
40.	Kishore K Das Memorial Prize for securing highest marks in Part-III (Home Paper) Associate Membership Examination of the Institute	AMIIChE Exam held in September 2017 Mr Krunal S Chauhan Vadodara, Gujarat AMIIChE Exam held in March 2018 Mr Gaurang M Notiya Vadodara, Gujarat
41.	Prof D K Guha Award for AMIIChE Candidates	Mr Deepak Kumar Gupta Panipat, Haryana
42.	N R Nandi Memorial Prize	Mr Rajeshkumar Amrutlal Modh Vadodara, Gujarat
43.	M P Chary Memorial Award	Mr Nitin V Thombre ICT, Mumbai
44.	Late Lakshmi Nandakumar Awasrd of the Institute for best presentation in Schemcon 2017 by a Lady Student	Ms Sameera V NIT, Raipur

Sl. No.	Name of the Awards/Prizes	Awardees of the Year
45.	Gouri Dutta Award for the Best Paper presentation in Schemcon 2017 of the Indian Institute of Chemical Engineers	Mr Amit Vaghasia PDPU, Gandhinagar, Gujarat
46.	Ambuja's Young Researcher's Awards for doing Post-Graduate Studies in India after GATE Examination (Ten Prizes)	Ms Surbhi Kumari Ashutosh Kumar, IISc, Bangalore Mr Khantesh Mohanbhai Agrawal, IISc, Bangalore Mr Harsh Parimal Thakkar, ICT, Mumbai Ms Shruti Singh, ICT, Mumbai Mr Radhish Gupta, ICT Mumbai Mr Himanshu Malani, IIT, Delhi Mr Rahul Jain, IIT, Kanpur Mr Amit Kumar Dubey, IIT, Kanpur Mr Pankaj P Kadam, IIT, Kanpur Mr Hari Hitesh Desai, NIT, Durgapur
47.	Ambuja's Best Student Chapter Award (2 Prizes)	1st Prize: IIChE Student Chapter, Shroff S R Rotary Institute of Chemical Technology, Bharuch 2nd Prize: IIChE Student Chapter, SSN College of Engineering, Kalavakkam
48.	Pidilite's Best Student Chapter Award	IIChE Student Chapter Kongu Engineering College Perundurai, Erode
49.	Best Regional Centre Award (3 Prizes)	Category "A" Best Ankleshwar Regional Centre, IIChE Category "B" Best Annamalai-Neyveli Regional Centre, IIChE Category "B" Second Best Guntur Regional Centre, IIChE
50.	Prof.P.Sen Gupta Award for Best Employee of the Year	Mrs Dulu Das IIChE HQ, Kolkata
51.	Acharya P C Ray Award for the Best Home Paper at the Final Degree Examination	1st Prize: Mr Shobhit Shukla AMIIChE passed 2nd Prize Mr Athul Seshadri R, SASTRA University, Thanjavur
52.	Ambuja's Best Home Paper or Design Project Report Awards	1st Prize Mr Krunal S Chauhan AMIIChE passed 2nd Prize Mr Ishwar Chandra Shukla AMIIChE passed 3rd Prize Mr Hariharan Shivakumar SASTRA University, Thanjavur
53.	Pankaj P Patel Trust Essay Competition Prize	Mr Abhishek A Thakkar G.H. Patel College of Engg. and Technology, Vallabh Vidyanagar
54.	VICAL Award for best Students Activities for the Best Paper Presentation during the previous SCHEMCON (3 Prizes)	1st Prize Mr Satyabrata Sahoo Sk Nadeemuddin R Murmu Indira Gandhi Institute of Technology, Sarang 2nd Prize Ms Shrawani Shailesh Nimje Ms Rakshita S Chahande Priyadarshini Institute of Engg. and Technology, Nagpur 3rd Prize Mr Ch V V Rahul Ms Deepthi Mohanty Gayatri Vidya Parishad College of Engg., Visakhapatnam
55.	Fellows	Professor Parameswar De Dr Debapriya Mandal Professor Anil K Saroha Professor M Lakshmi Kantam Dr U Kamachi Mudali

COMING EVENTS

12th Annual India Chemical Industry Outlook Conference
Date: 7, 8 February 2019
Venue: Mumbai, India
Organiser: Indian Chemical Council
Email: Iccmumbai@iccmail.com
Website: www.Indianchemicalcouncil.com

NCEEE 2019: 2nd International Conference on New Frontiers in Chemical, Energy and Environmental Engineering
Date: 15, 16 February 2019
Venue: Warangal, India
Organiser: Department of Chemical Engineering, NIT Warangal
Email: inceee2019@gmail.com
Website:www. cms.nitw.ac.in/conference/inceee2019

Nanomaterials for Environmental Applications
Date: 6, 7 March 2019
Venue: Panaji, India
Organiser: DCTs Dhempe College of Arts and Science
Contact Person: Dr Miskil Naik
Email: nea2019@dhempecollege.edu.in
Website http://www.nea2019.org

ACC-19: Applied Catalysis & Chemical Engineering
Date: 8 – 10 April 2019
Venue: Dubai, UAE
Organiser: Eigen Scientific Group, USA
Tel: +1(650) 614 1679
Email: contact@appliedcatalysis.com
Website: https://www.eigenscientificgroup.com/conference/catalysis-2019/

Partec 2019: International Congress on Particle Technology
Date: 9 – 11 April 2019
Venue: Nürnberg, Germany
Contact: NürnbergMesse GmbH, PARTEC Project Team
Tel: +49 (0) 9 11.86 06- 89 40
Website: https://www.partec.info/

ICHTFF: ISER International Conference on Heat Transfer and Fluid Flow
Date: 15, 16 April 2019
Venue: New Delhi, India
Contact Person: Conference CoordinatorÊ
Email: info@iser.co
Website: https://ser.co/Conference2019/India/1/ ICHTFF

12th IWA International Conference On Water Reclamation and Reuse
Date: 16 – 20 June, 2019
Venue: Berlin, Germany
Website: http://efce.info/IWA+Conference+2019.html

12th European Congress of Chemical Engineering
Date: 15 - 19 September, 2019
Venue: Florence, Italy
Organiser: AIDIC
Website: http://www.aidic.it/ecce12/

Fees for Different Categories of IIChE Membership

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Life Associate Members (For all age groups)	**Compound Fees** Rs. 5,000/- (Including Registration Fee Rs. 100/- and Admission Fee Rs 400/-)
Student Members	**Compound Fees** **Rs. 500/-** (Including Admission Fee Rs. 100/-)

- **Interested candidates may apply online for membership. Please visit www.iiche.org.in**

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